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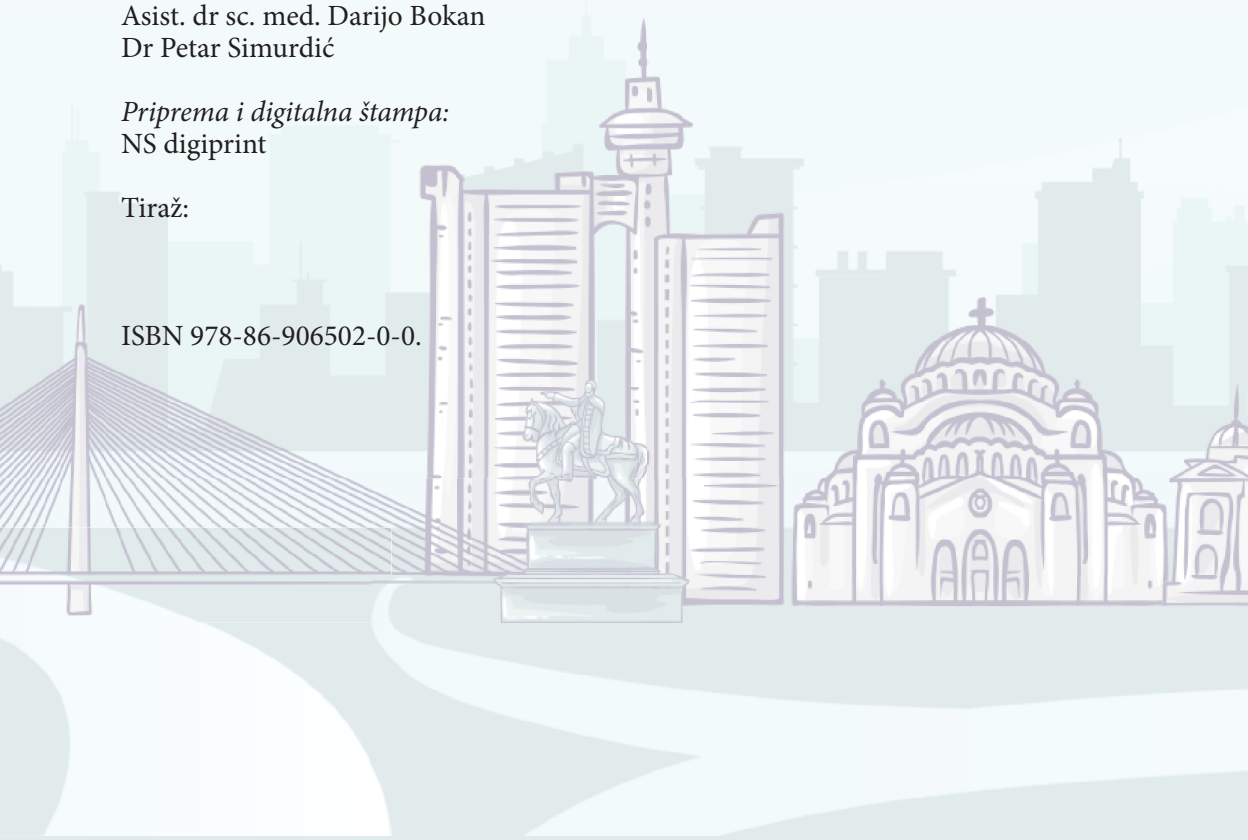

P01 NEOPERATIVNI TRETMAN HAMARTOMA BRONHA – PRIKAZ SLUČAJA

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UVOD

Hamartom je jedan od ubikvitarnih benignih plućnih tumora, koji se uobičajeno javlja u plućnom parenhimu; ovaj tip tumora se najčešće rešava hirurškom resekcijom. Hamartom se ređe može naći endobronhijalno, i uzrokovati parcijalnu ili kompletnu bronhoobstrukciju i krvarenje.

PRIKAZ SLUČAJA

Prikazujemo slučaj endobronhijalnog hamartoma kod 51-godišnjeg muškarca, koji je u januaru 2022 godine bio upućen na Kliniku za pulmologiju i alergologiju zbog protrahiranog, produktivnog kašlja nekoliko meseci, povremeno sa sukrvičavim sputumom i promenom na kompjuteriiziranoj tomografiji na nivou bronha za gornji lobus desno. Bronhoskopijom je detektiran respiratorno mobilni, papilomatozni tumor koji skoro kompletno zatvara desni glavni bronh. Endoskopska eksploracija je pokazala da je baza tumora na gornjoj desnoj karini, i da su distalni bronhi normalno prohodni. Bronhobiopsijom i iglenom biopsijom je dokazan benigni tumor – hamartom. Pacijent nije pristao na operativni zahvat, pa je u martu 2022 godine pristupljeno endobronhijalnom rešavanju tumora. Intervencija je urađena u hirurškoj sali, kroz endotrahealni tubus, kombiniranjem elektrokauterizacije sa argon-plazmom, bez komplikacija. Nakon intervencije, rezidualno tkivo na bazi gornje karine je tretirano argon plazmom. Na kontrolnim eksploracijama nakon 1 i 3 meseca vidi se samo cikatriks od resekcije. Kontrolni CT grudnog koša nakon 9 meseci i 24 meseci ne pokazuje znake progresije bolesti.

ZAKLJUČAK

Razvoj interventne bronhologije omogućava neoperativno rešavanje intraluminalnih procesa, kod specifičnih, strogo selektiranih pacijenata.

KLJUČNE REČI

Hamartom, endoskopska resekcija, interventna bronhologija

P01 NON-SURGICAL TREATMENT OF BRONCHIAL HAMARTOMA – CASE REPORT

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INTRODUCTION

Hamartoma is one of the most common benign lung tumors, which typically occurs in the lung parenchyma; this type of tumor is usually solved by surgical resection. Hamartoma can rarely be found endobronchially, causing partial or complete broncho-obstruction and bleeding.

CASE REPORT

We present a case of endobronchial hamartoma in a 51-year-old man, who was referred to the Clinic for Pulmology and Allergy in January 2022 due to a persistent, productive cough which lasted for several months, occasionally with bloody sputum and a tumor at the level of the right upper lobe bronchus, detected on computerized tomography of the chest. Bronchoscopy revealed a, papillomatous tumor, respiratory mobile, which almost completely occluded the right main bronchus. Endoscopic exploration showed that the base of the tumor was attached to the upper right carina, and that the distal bronchi were patent. Bronchial biopsy and needle aspiration biopsy proved a benign tumor – hamartoma. The patient did not agree to surgical treatment, and in March 2022, endobronchial treatment of the tumor was recommended. The intervention was performed in the operating room, through an endotracheal tube, by combining electrocautery with argon plasma, without complications. After the intervention, the residual tissue at the base of the upper carina was treated with argon plasma. On control explorations after 1 and 3 months, only the cicatrix from the resection was detected. Control chest CT after 9 months and 24 months show no signs of disease progression.

CONCLUSION

The development of interventional bronchology enables non-operative resolution of intraluminal processes in specific, strictly selected patients.

KEYWORDS

Hamartoma, endoscopic resection, interventional bronchology

P02 BEZBEDNOST BRONHOSKOPIJE KOD PACIJENTA SA TROMBOCITOPENIJOM

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UVOD

Trombocitopenija može biti prva manifestacija tumora kao što je karcinom pluća. Ovo stanje može biti posledica metastaza u koštanoj srži ili kao deo hematoloških poremećaja povezanih sa tumorom, kao što su imunološka trombocitopenična purpura, mijelodisplastični sindrom ili amegakariocitna trombocitopenija.

PRIKAZ SLUČAJA

Pacijentkinja stara 63 godine je hospitalizovana aprila 2024. godine u Institutu za plućne bolesti Vojvodine radi dijagnostike promene u desnom plućnom krilu. Povodom trombocitopenije pacijentkinja je lečena od strane hematologa kada je načinjena biopsija koštane srži. Urađen je CT grudnog koša na kome se opisuje u regiji desnog plućnog hilusa mekotkivna formacija 3,3×4×11,6 cm. U donjoj cervikalnog grupi obostrano uvećani limfni čvorovi (lgl), u medijastinumu uvećani lgl grupe 2 i 3 kao i u levom hilusu. Nekoliko solidnih nodusa u desnom plućnom parenhimu, do 13 mm, kao i više mikronodusa difuzne distribucije obostrano. Jetra sa mnogobrojnim sekundarnim depozitima. Kada su trombociti, nakon transfuzijama koncentrovanih trombocita, dostigli vrednost od 61×10^9/L, urađena je bronhoskopija, endoskopski nalaz ukazuje na infiltrovan medijalni zid početnog dela desnog glavnog. Patohistološkim pregledom postavljena je dijagnoza mikrocelularnog karcinoma kliničkog stadijuma bolesti T4N2M1c. Naknadno pristigao nalaz biopsije koštane srži: metastaze neuroendokrinog tumora verovatno porekla pluća. Onkološki Konzilijum donosi odluku da prema hematološkim parametrima nije moguće sprovesti specifičnu onkološku terapiju, a prema metastatskom stadijumu bolesti nije moguća primena radioterapije primarnog tumora.

ZAKLJUČAK

Endoskopski postupci su relativno bezbedni kod pacijenata sa karcinomom koji imaju broj trombocita veći od 50 × 10^9/L. Ipak, broj trombocita od ≥20 × 10^9/L može biti odgovarajući prag za transfuziju trombocita i kada nema hemoragijskog sindroma, da bi se radi planirane intervencije postigla dozvoljena vrednost od 50 × 10^9/L. Odluka o izvođenju endoskopskih procedura treba da bude individualizovana i temeljena na celokupnoj kliničkoj slici svakog pacijenta.

KLJUČNE REČI

Karcinom pluća, bronhoskopija, trombocitopenija.

P02 SAFETY OF BRONCHOSCOPY IN PATIENTS WITH THROMBOCYTOPENIA

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INTRODUCTION

Thrombocytopenia can be the initial manifestation of tumors such as lung cancer. This condition may result from bone marrow metastases or hematological disorders associated with the tumor, such as immune thrombocytopenic purpura, myelodysplastic syndrome, or amegakaryocytic thrombocytopenia.

CASE REPORT

A 63-year-old female patient was hospitalized in April 2024 at the Institute for Pulmonary Diseases of Vojvodina for the diagnosis of changes in the right lung lobe. Given her thrombocytopenia, she received treatment from a hematologist and underwent a bone marrow biopsy. A chest CT revealed a soft tissue mass near the right pulmonary hilum measuring 3.3x4x11.6 cm. Additionally, bilateral lymph node enlargement was observed in the lower cervical and mediastinal regions, with nodules present in the right lung parenchyma and multiple micronodules scattered bilaterally. The liver showed numerous secondary deposits. After platelets reached a value of 61×10^9/L following transfusions, bronchoscopy was performed, with endoscopic findings indicating infiltration of the medial wall of the initial part of the right main bronchus. Histopathological examination confirmed the diagnosis of small cell carcinoma, clinical stage T4N2M1c disease. Subsequent bone marrow biopsy findings revealed metastases of a neuroendocrine tumor, likely of pulmonary origin. The Oncology Council decided that specific oncological therapy is not possible according to hematological parameters, and according to the metastatic stage of the disease, radiotherapy of the primary tumor is not possible.

CONCLUSION

Endoscopic procedures are relatively safe in patients with cancer who have platelet counts greater than 50 × 10^9/L. However, a platelet count of ≥20 × 10^9/L may be an appropriate threshold for platelet transfusion, even in the absence of hemorrhagic syndrome, to achieve the permissible value of 50 × 10^9/L for planned interventions. The decision to perform endoscopic procedures should be individualized and based on the overall clinical picture of each patient.

KEYWORDS

Lung cancer, bronchoscopy, thrombocytopenia.

P03 KLINIČKE DILEME U DIJAGNOSTICI I LIJEČENJU PLUĆNE TUBERKULOZE

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UVOD

Melanom je često maligno oboljenje kože sa značajnom stopom smrtnosti i visokim potencijalom metastaziranja u bilo koji organ. Tuberkuloza pluća je ne tako rijedak nalaz kod imunokompromitovanih pacijenata te može da predstavlja veliki dijagnostički izazov zbog raznolikosti kliničke slike i radiološke prezentacije. U sklopu obrade i praćenja pacijenata sa melanomom, radiološki verifikovani solidni nodulusi u plućnom parenhimu su čest propratni nalaz. Postavljanje definitivne dijagnoze može da zahtijeva hirurške procedure, a liječenje multidisciplinarni pristup.

PRIKAZ SLUČAJA

U radu je prikazan 55-ogodišnji pacijent kojem je patohistološki verifikovan maligni melanom kože pektoralne regije, Clark I, stadijum pTis, te su u sklopu radiološkog praćenja, skoro tri godine nakon dijagnoze melanoma, verifikovani multipli nodulusi u gornjem režnju lijevog plućnog krila. Na učinjenom PET/CT skenu verifikovana je progresija nodularnih promjena u plućima uz de novo promjene u desnom plućnom krilu, suspektnim na sekundarne depozite. Kulturom sputuma se izoluje Klebsiella spp, a preostali mikrobiološki nalazi pristignu negativni. Onkološki konzilijum indikuje UVATS biopsiju promjena u desnom plućnom krilu koja se i učini, uz atipičnu resekciju S2 desno. Patohistološki nalaz opiše granulomatozno zapaljenje sa nekrozom, acidoalkoholnorezistentni bacili nisu nađeni. Pacijent je hospitalizovan u Kliniku za plućne bolesti Univerzitetskog kliničkog centra Republike Srpske gdje je učinjena dodatna bronhološka i mikrobiološka obrada na Mycobacterium tuberculosis, kojom se isti ne dokaže. Uzimajući u obzir patohistološki nalaz, pozitivnu porodičnu anamnezu, konzilijarnom odlukom tima pulmologa sprovede se liječenje antituberkuloznom terapijom na koju se dobije pozitivan odgovor. Na kontrolnoj KT grudnog koša viđena je potpuna regresija opisanih promjena.

ZAKLJUČAK

Solidni plućni nodulusi su relativno čest radiološki nalazi, koji se obično otkrivaju slučajno. Definitivna dijagnoza se postavlja patohistološkom potvrdom bolesti. Multidisciplinarni pristup pacijentu je od velikog značaja za pravilnu dijagnostiku i liječenje pacijenata, a veće dijagnostičke intrige je najpravilnije rješavati na višečlanovnim konzilijumima za različite bolesti u cilju zajedničke odluke o liječenju.

KLJUČNE REČI

Tuberkuloza, torakalna hirurgija, video-asistirana, plućni nodulus

P03 CLINICAL DILEMMAS IN THE DIAGNOSIS AND TREATMENT OF PULMONARY TUBERCULOSIS

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INTRODUCTION *

Melanoma is a common malignant skin disease with a significant mortality rate and a high potential for metastasis to any organ. Pulmonary tuberculosis is not a rare finding in immunocompromised patients and can represent a major diagnostic challenge due to the variety of clinical picture and radiological presentation. As part of the diagnosis and follow-up of patients with melanoma, radiologically confirmed solid nodules in the lung parenchyma are a frequent accompanying finding. Establishing a final diagnosis may require surgical interventions, and treatment a multidisciplinary approach.

CASE REPORT *

We present the case of a 55-year-old patient with pathohistologically verified malignant melanoma of the skin of the pectoral region, Clark I, stage pTis, and as part of the radiological follow-up, almost three years after the melanoma diagnosis, multiple nodules verified in the upper lobe of the left lung. The PET CT scan verified the progression of lung nodules, along with „de novo" nodules on the right lung, suspicious for secondary deposits. Klebsiella spp was isolated by sputum culture, and other microbiological findings were negative. The multidisciplinary tumor board indicated a UVATS biopsy of the right lung, which was performed, along with an atypical resection of S2 of the right lung. The pathohistological findings described granulomatous inflammation with necrosis, acid-alcohol-resistant bacilli were not found. The patient was hospitalized in the Clinic for Pulmonary Diseases, the University Clinical Centre of the Serb Republic, where an additional bronchoscopy and microbiological examination for Mycobacterium tuberculosis was performed, whithe negative results. Taking into account the pathohistological findings and the positive family history, by the decision of the pulmonologist team, treatment with antituberculosis therapy was carried out, to which a positive response was obtained. Complete regression of the described changes was seen on control chest CT.

CONCLUSION

Solid pulmonary nodules are relatively common radiological findings, usually discovered incidentally. The final diagnosis is established by pathohistological examination. A multidisciplinary approach to the patient is of great importance for correct diagnosis and treatment of patients, and major diagnostic intrigues are best resolved at multi-member councils for different diseases in order jointy decide on the treatment.

KEYWORDS

Tuberculosis, melanoma, thoracic surgery, video-assisted, pulmonary nodules

P04 NETRAUMATSKI HILOTORAKS UZROKOVAN VELIKOM ARTERIJSKOVENSKOM MALFORMACIJOM – PRIKAZ SLUČAJA

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UVOD

Hilotoraks predstavlja nakupljanje limfe u pleuralnom prostoru, i najčešće je uzrokovan povredom glavnih limfnih sudova u grudnom košu, ali i blokadom limfne drenaže od strane malignih ili benignih ekspanzivnih procesa. Dokazuje se laboratorijskom potvrdom triglicerida u pleuralnoj tečnosti većoj od 1,24 mmol/L i holesterola manjoj od 5,18 mmol/l. Prikazan je veoma redak slučaj pacijenta sa recidivirajućim hilotoraksom zbog postojanja velike stečene arterijskovenske malformacije(AVM).

PRIKAZ SLUČAJA

Pacijent star 62 godine, primljen je u našu bolnicu radi izvođenja invazivne plućne dijagnostike a zbog tegoba u vidu gušenja, malaksalosti, zamaranja na manji fizički napor i nemogućnosti ležanja na leđima, koje su se pojavile naglo oko 10 dana pre prijema. Inače, pre 24 godine je angiografski dokazana velika arterijskovenska malformacija desne strane vrata i gornje aperture toraksa. RTG i MSCT grudnog koša su pokazali masivnu desnostranu pleuralnu efuziju, bez znakova za prisutvo maligne medijastinalne mase. Fiberoptičkom bronhoskopijom nisu viđeni znaci za centralnu malignu neoplazmu, već samo znakove kompresije na lateralni zid bronha za bazalni buket sa desne strane. Ultrazvučnim navođenjem je učinjena torakocenteza desno i tom prilikom je dobiven gusti tečni sadržaj, tamno narandžaste boje, biohemijskih karakteristika eksudata sa velikom količinom triglicerida(4,19 mmol/l) i smanjenom koncentracijom holesterola(1,3 mmol/l). Zaključeno je da se radi o hilotoraksu, te se pristupilo ponavljanim torakocentezama uz primenu hiperproteinske dijete sa redukcijom masti koje sadrže dugolančane masne kiseline. Zbog brze reakumulacije, učinjena je toraksna drenaža koja je uz primenjenu dijetu dala povoljni efekat na brzinu stvaranje hilozne tečnosti. Zbog velikog intraoperativnog rizika, odustalo se od operacije arterijskovenske malformacije, kao uzroka hilotoraksa.

ZAKLJUČAK

Brojni su etiološki faktori za stvaranje hilotoraksa i uvek treba misliti na retke netraumatske i nemaligne uzroke. Brzo postavljenje diagnoze, kao i palijativno i hirurško zbrinjavanje, imaju povoljni efekat na tok i lečenje ovog stanja.

KLJUČNE REČI

Hilotoraks, arterijskovenska malformacija, torakocenteza, toraksna drenaža.

P04 NON-TRAUMATIC HYLOTHORAX CAUSED BY A LARGE ARTERIOVENOUS MALFORMATION – CASE REPORT

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INTRODUCTION

Chylothorax represents the accumulation of lymph in the pleural space, and is most often caused by injury to the main lymphatic vessels in the chest, but also by blockage of lymphatic drainage by malignant or benign expansive processes. It is proven by laboratory confirmation of triglycerides in pleural fluid greater than 1.24 mmol/L and cholesterol less than 5.18 mmol/l. A very rare case of a patient with recurrent chylothorax due to the presence of a large acquired arteriovenous malformation (AVM) is presented.

CASE REPORT

A 62-year-old patient was admitted to our hospital for invasive lung diagnostics because of complaints such as suffocation, weakness, fatigue with minor physical exertion and the inability to lie on his back, which appeared suddenly about 10 days before admission. By the way, 24 years ago, a large arteriovenous malformation of the right side of the neck and upper thoracic aperture was proven angiographically. X-ray and MSCT of the chest showed a massive right-sided pleural effusion, without signs of a malignant mediastinal mass. Fiberoptic bronchoscopy showed no signs of a central malignant neoplasm, but only signs of compression on the lateral wall of the bronchus for the basal bouquet on the right side. Thoracentesis was performed on the right with ultrasound guidance, and on that occasion a thick liquid content, dark orange in color, with biochemical characteristics of exudate with a large amount of triglycerides (4.19 mmol/l) and a reduced cholesterol concentration (1.3 mmol/l) was obtained. It was concluded that it was a chylothorax, and repeated thoracentesis was performed with the use of a hyperprotein diet with reduced fat containing long-chain fatty acids. Due to rapid reaccumulation, thoracic drainage was performed, which, along with the applied diet, had a favorable effect on the rapid formation of chylous fluid. Due to the high intraoperative risk, the operation of arteriovenous malformation, as the cause of chylothorax, was abandoned.

CONCLUSION

There are numerous etiological factors for the formation of chylothorax and one should always consider rare non-traumatic and non-malignant causes. Quick diagnosis, as well as palliative and surgical care, have a favorable effect on the course and treatment of this condition.

KEYWORDS

Chylothorax, arteriovenous malformation, thoracentesis, thoracic drainage.

P05 APSCEDIRAJUĆA PNEUMONIJA UZROKOVANA ASPIRACIJOM STRANOG TELA

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UVOD

Pneumonije su zapaljenski proces delova pluća distalno od terminalnih bronhiola, koji zahvata alveolarne duktuse, sakuluse, alveole i /ili plućni intersticijum, dok je apsces lokalizovano gnojno zapaljenje sa pratećom nekrozom i kolikvacijom plućnog parenhima koje dovodi do stvaranja šupljine u plućima. Apscedirajuće pneumonije najčešće nastaju kao posledica dugotrajne infekcije pluća nekim vrstama bakterija kao što su Klebsijela ili Stafilokok ili pak kao posledica aspiracije iz gornjih disajnih puteva, infekcije distalno od tumora, hematogene infekcije, traume pluća ili širenja iz abdomena. Zbog diferencijalno-dijagnostički velikog broja kliničkih entiteta kao što su ekskavirani tumori, tuberkulozne kaverne, inficirane bule, bronhogene i hidatidne ciste, Vegenerova granulomatoza, dijafragmalne hernije, često je neophodno, pored imidžing metoda, uraditi i invazivnu dijagnostiku – bronhoskopiju kojom se u velikom broju ovakvih slučajeva dokaže inicijalni uzročnih komplikovanih pneumonija.

PRIKAZ SLUČAJA

Pacijentkinja stara 59 godina, bivši pušač, boluje od povišenog krvnog pritiska i koronarne bolesti hospitalizovana u Specijalnoj bolnici u Surdulici zbog visoke temperature, kašlja sa iskašljavanjem zelenog ispljuvka, bolova u grudnom košu, preznojavanja i malaksalosti. Nakon inicijalnog lečenja na primarnom nivou upućena pod sumnjom na desnostranu pneumoniju. Nakon šest nedelja lečenja antibioticima zbog kliničkog i radiološkog pogoršanja učinjena je i bronhoskopija kojom prilikom je ekstrahovano strano telo iz donjeg režnja desnog pluća nakon čega se tegobe povlače i dolazi do značajnog kliničkog i radiološkog poboljšanja.

ZAKLJUČAK

S obzirom da je čest problem u kliničkoj praksi „dijagnostički previd“ čak i od strane specijalista, smatramo da su, u određenom broju nejasnih, komplikovanih kliničkih stanja, invazivne dijagnostičke procedure kao što je bronhoskopija u diferencijalno-dijagnostičkom smislu neophodne radi utvrđivanja uzroka bolesti, sprovođenja pravovremene adekvatne terapije i sprečavanja nepotrebnih komplikacija.

KLJUČNE REČI

Apscedirajuća pneumonija, bronhoskopija, diferencijalna dijagnostika, strano telo.

P05 ABSCESSING PNEUMONIA CAUSED BY ASPIRATION OF A FOREIGN BODY

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INTRODUCTION *

Pneumonia is an inflammatory process of parts of the lungs distal to the terminal bronchioles, which involves the alveolar ducts, saccules, alveoli and/or the lung interstitium, while an abscess is a localized purulent inflammation with accompanying necrosis and collimation of the lung parenchyma, which leads to the formation of a lung cavity. Abscessing pneumonia most often occurs as a result of long-term lung infection with some types of bacteria such as Klebsiella or Staphylococcus or as a result of aspiration from the upper respiratory tract, infection distal to the tumor, hematogenous infection, lung trauma or spread from the abdomen. Due to the differential-diagnosis of a large number of clinical entities such as excavated tumors, tuberculous caverns, infected bullae, bronchogenic and hydatid cysts, Wegener's granulomatosis, diaphragmatic hernia, it is often necessary, in addition to imaging methods, to perform invasive diagnostics – bronchoscopy, which in a large number such cases prove the initially causative complicated pneumonia.

CASE REPORT

A 59-year-old female patient, a former smoker, suffers from high blood pressure and coronary disease, hospitalized in the Special Hospital in Surdulica due to high temperature, cough with green sputum, chest pain, sweating and weakness. After initial treatment at the primary level, she was referred on suspicion of right-sided pneumonia. After six weeks of treatment with antibiotics due to clinical and radiological deterioration, a bronchoscopy was performed, during which a foreign body was extracted from the lower lobe of the right lung, after which the symptoms subsided and there was a significant clinical and radiological improvement.

CONCLUSION

Given that a frequent problem in clinical practice is "diagnostic oversight" even by specialists, we believe that, in a certain number of unclear, complicated clinical conditions, invasive diagnostic procedures such as bronchoscopy in the differential-diagnostic sense are necessary to determine the cause of the disease, implementation of timely adequate therapy and prevention of unnecessary complications.

KEYWORDS

Abscessing pneumonia, bronchoscopy, differential diagnosis, foreign body.

P06 BRONHOSKOPSKA LAVAŽA U TRETMANU APSCESA PLUĆA

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UVOD

Apsces pluća može biti izazvan mnogobrojnim patogenim i uslovno patogenim bakterijama. Najčešći uzrocnici su: Staphylococcus aureus, Diplococcus pneumoniae, Streptococcus pneumoniae, Escherichia colli, Pseudomonas aeruginosa, dok se anaerobi retko izoluju. Infekcija nastaje inhalacijom uzročnika i širenjem iz okolnih ili udaljenih gnojnih ognjišta preko krvi ili limfe. Dijagnoza se postavlja na osnovu anamneze, kliničkog pregleda, rendgenografijom pluća, kao i bronhoskopskim pregledom. Laboratorijske analize pokazuju leukocitozu sa granulocitozom, ubrzanu sedimentaciuju, porast nespecificnih inflamatornih markera, često i sekundarnu anemiju. Od posebnog značaja je citološki nalaz u sputumu. Direktnom baciloskopijom i kulturom otkrivaju se uzročnici. Lecenje apscesa pluća u kliničkoj praksi je složeni postupak zbog postojanja više uzročnika i sprovodi se istovremenim davanjem dva antibiotika u maksimalnim dozama prema antibiogramu sputuma. Uspešnom lečenju od koristi mogu biti posturalna drenaža, primena bronhodilatatora, sekretolitika i ekspektoransa, a endoskopsku lavazu svavako treba prineniti osim u tezim slucajeva gde postoje apsolutne kontraindikacije za bronhoskopiju. Taktika lecenja plucnog abscesa direktno zavisi od tezine bolesti, ali se uvek sprovodi u bolnickim uslovima. Najveći broj obolelih uspešno se izleči u toku 6 do 8 nedelja. Neizlečeni apsces posle 8 nedelja označava se hroničnim i treba ga podvrgnuti hirurškom lečenju.

PRIKAZ SLUČAJA

Slucaj 1. GI, muskarac star 40 godina, nepusac, bez komorbiditeta, negativna licna i porodicna anamneza. Hospitalizovan na Pulmoloskom odeljenju oktobra 2023 zbog abscesa levog gornjeg reznja (u projekciji lingule). Simptomi su se javili 3 nedelja prethodno: febrilnost do 39C glavno tipa kontinua u popodnevnim i vecernjim satima, sa povremenom drhtavicom, jezom, preznojavanjem nocu, lakim smanjenjem apetita, produktivnim kasljem sa obilnom ekspektoracijom gustog tamnozelenog sekreta sa putridnim mirisom koji je jako zaudarao (miris "trulezi"). Bila je primenjena antibiotska terapija (tbl cefixim 400 1x1) u trajanju od deset dana bez efekta. Na radiografiji grudnog kosa u projekciji lingule videla se velika kavernozna promena (precnika od 10 cm) sa nivoom i izrazenim perikavernoznim infiltratom u konekciji sa srcanom i senkom lateralnog toraksnog zida. Laboratorijske analize su pokazale povecanje nespecificnih inflamatornih markera (CRP preko 200, ref vrednost do 5), uvecanu SeErc 84 za prvi sat, leukocitozu od 13.5/mm3 sa dominacuijom neutofila od 95% i lakse povecanje D-dimera (1090, ref <500). Nije dobivena bakterioloska potvrda iz bronhoaspirata (kulture su ostale negativne nakon inkubacije od 48

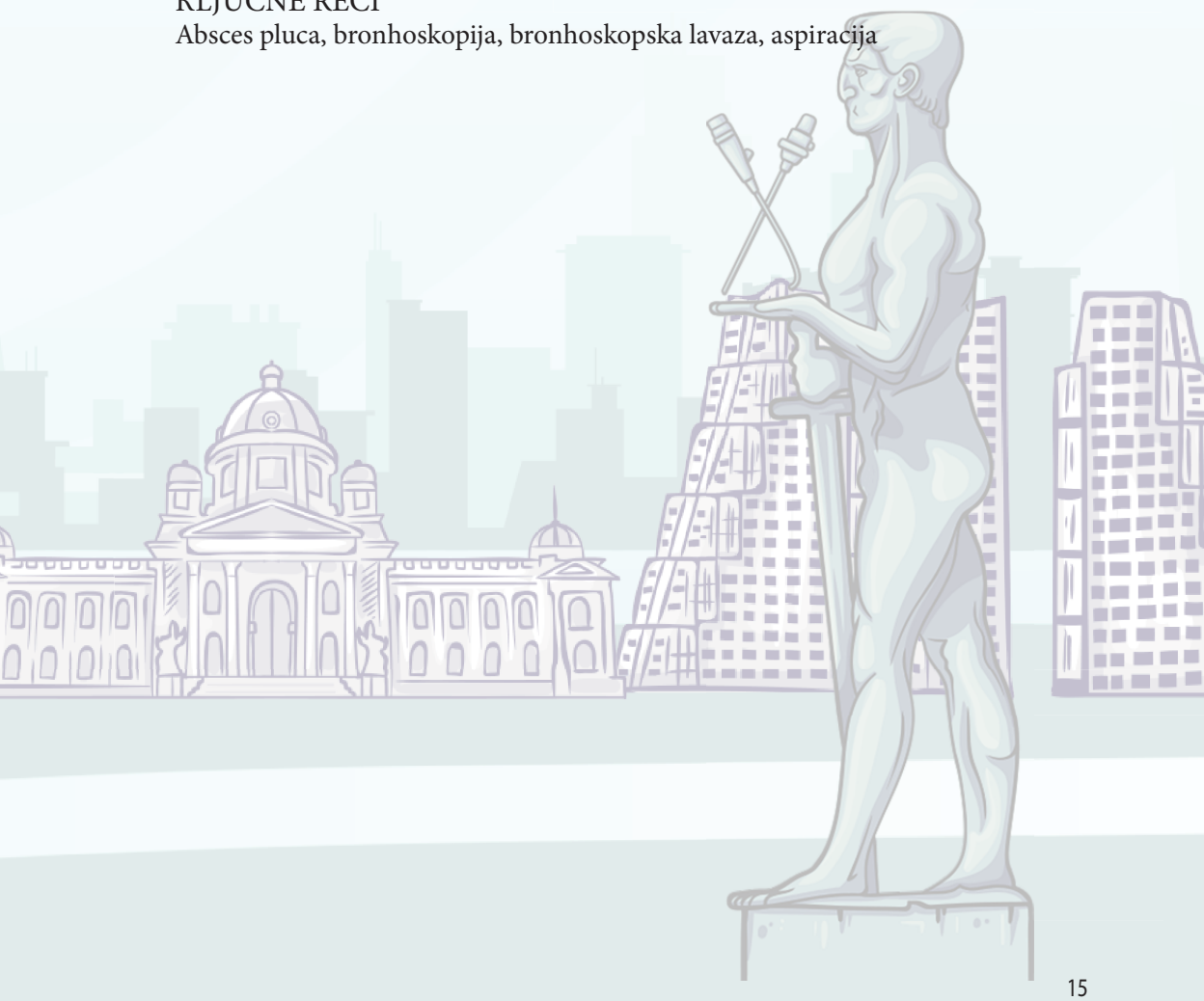
sati). Na CT toraksa se videla velika abscesna formacija i konsolidacija u linguli sa vazdusnim bronhogramom, te reaktivno uvecane medijastinalne limfoglandule. Bronhoskopija je pokazala urednu prolaznost do subsegmenata, hiperemija sluzokoze levog bronhijalnog stabla sa obilnim belicastim sekretom koji nailazi iz bazalnih segmentalnih usca. Nakon aspiracije izvrsena je lavaza sa 500 ml fizioloskog rastvora 0.9% NaCl. Postupak je ponovljen 14 puta tokom hospitalizacije od 20 dana, kontrolna grafija pri otpustu je pokazala rezoluciju sa smanjenjem debljine zidova i perikavernoznih infiltrata. Rtg grafija (PA i lateralna projekcija) pre pocetka terapije U toku hospitalizacije kod pacijenta su uradjene 14 bronhoskopje sa lavazom od 500 do 750 ml fizioloskog rastvora 0.9% NaCl i aspiracijom sadrzaja (bronhoskopska lavaza je bila radjena jedan put na 24 casova. Radiografije su pokazivale redukciju abscesne supljine, tako da za period od 14 dana je primecena redukcija za vise od polovine (od 4 na oko 1.5 cm). Subjektivno stanje se znacajno popravilo, paciejt je bio afebrilan za cello vreme hospitalizacije, apetit se normalizovao, dobio je na telesnu tezinu. Nakon otpusta produzen je medikamentozni tretman sledeca tri meseca sa clindmicoom u dozi od 600 mg/24 casa. Radioloska slika je pokazala potpunu normalizaciju nakon tri meseci. Rtg grafija (PA i lateralna projekcija) nakon tri meseca od pocetka terapije Slucaj 2. SP, muskarac star 70 godina, bez komorbiditeta, pusi po 5 cigareta na dan, ne konsumira alkohol. Hospitalizovan zbog kaslja sa ekspektoracijom gustog sekreta sa zelenim gnojavim i krvavim primesama, visoke febrilnosti sa pojavom groznice. Simptomi su se javili dve nedelje pre prijema. Sproveden tretman antibiotikom nije imao osobitog efekta zbog cega je indikovana hospitalizacija. Na radiografiji grudnog kosa desno u visini hilusa videla se okrugla formacija sa nivoom i suspektnim prikazom drenaznog bronha. CT toraksa je pokazao kavitacionu leziju aproksimativne velicine 8.5x7.6 cm sa aerolikvidnim nivoom i celijskim detritusom. Pratile su se i reaktivno uvecane hilarne i paratrahealne limfoglandule. Laboratorijske analize su pokazale povecanje nespecificnih inflamatornih markera (CRP 184, ref vrednost do 5), uvecanu SeErc 106 za prvi sat, leukocitozu od 21.5/mm3 sa dominacuijom neutofila od 90% i povecanje D-dimera (3080, ref <500). U toku hospitalizacije primenjen je dvojni antibiotski tretman (sirokospektarni i antianaerobik) sa ekscesivnom suportivnom terapijom. Postiglo se klinicko poboljsanje, a radioloski se pratila usporena rezolucija. Bronhoskopija je pokazala urednu prolaznost do subsegmenata. Bronhoskopska lavaza je bila radjena 8 puta (iz aspirata nisu izolovani patogeni uzrocnici, bakterioloski pregled nije pokazao porast kultura nakon inkubacije). Zbog perzistiranja radioloskih promena u dva navrata je bila uradjena bronhobiopsija i transbronhijalna biopsija (histopatoloskom analizom uzetih primeraka nije bio detektovan malignitet, specifican process ili drugi nalaz koji bi se uklapao u odredjeni klinicki entitet). Sveukupni nalaz je odgovarao plucnom abscesu, a ponavljane lavaze su pomogle ubrzavanju restitucije. Pratilo se klinicko i laboratorijsko poboljsanje, a rentgenski su se pratile promene u pravcu adhezija. Nakon otpusta pacijent je bio tretiran 3 meseci oralnim klindamicinom i privremenim oralnim steroidnim rezimom u opadajucim dozama. Pacijent je pracen tokom godinu dana od zavrsetka terapije. Nije zapazena pojava febrilnosti ili bilo kakve sumnje na recidiv.

ZAKLJUČAK

Prikazani su slucaji sa plucnim abscesom nastalim usled komplikacije pneumonije kod kojih nije dobivena bakterioloska potvrda. Tretman je bio empirijski dvojnim antibiotikom. Bronhoskopska lavaza i aspiracija sekreta bila je radjena svakodnevno u razumnom okviru podnosljivosti. Radiografsku regresiju smo dobili u ocekivanom vremenskom periodu, cime smo potvrdili uticaj i znacaj ponavljanih bronhoskopskih lavaza. Agresivnom aplikacijom fizioloskog rastvora kroz usce bronha anatomski zahvacenog segmenta i lobusa, vrseno je direktno ispiranje sluzavognojnog sadrzaja i detritusa, cime je bila olaksana tkivna regeneracija zahvacenog dela pluca i postigla se restitucija ad integrum u optimalnom vremenu sa redukovanjem stvaranja rezidua. Kod prikazanih smo dobili skoro potpunu radiolosku rezoluciju. Pacijenti su dobro podneli intervenciju i celokupni tretman. Ponavljane endoskopske lavaze fizioloskim rastvorom su imale pozitivan uticaj i u znacajnom obimu su pomogle konzervativnom lecenju.

KLJUČNE REČI

Absces pluca, bronhoskopija, bronhoskopska lavaza, aspiracija



P06 BRONCHOSCOPIC WASHING IN THE TREATMENT OF LUNG ABSCESS

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INTRODUCTION

Lung abscess can be caused by numerous pathogenic and conditionally pathogenic bacteria. The most common causative agents are: Staphylococcus aureus, Diplococcus pneumoniae, Streptococcus pneumoniae, Escherichia coli, Pseudomonas aeruginosa, while anaerobes are rarely isolated. The infection is caused by inhalation of the causative agent and its spread from surrounding or distant purulent foci via blood or lymph. The diagnosis is made on the basis of history, clinical examination, lung x-ray, as well as bronchoscopic examination. Laboratory analyzes show leukocytosis with granulocytosis, accelerated sedimentation, an increase in nonspecific inflammatory markers, and often secondary anemia. Of particular importance is the cytological finding in the sputum. Causative agents are detected by direct bacilloscopy and culture. Treatment of lung abscess in clinical practice is a complex procedure due to the existence of multiple causative agents and is carried out by simultaneous administration of two antibiotics in maximum doses according to the sputum antibiogram. Postural drainage, application of bronchodilators, secretolytics and expectorants can be useful for successful treatment, and endoscopic lavage should always be performed except in severe cases where there are absolute contraindications for bronchoscopy. The tactics of treating a lung abscess directly depends on the severity of the disease, but it is always carried out in hospital conditions. Most patients are successfully cured within 6 to 8 weeks. An untreated abscess after 8 weeks is considered chronic and should undergo surgical treatment.

CASE REPORT

Case 1. GI, 40-year-old man, non-smoker, no comorbidities, negative personal and family history. Hospitalized at the Pulmonology Department in October 2023 due to an abscess of the left upper lobe (in the projection of the lingula). The symptoms appeared 3 weeks previously: febrile up to 39C, mainly continuous type in the afternoon and evening, with occasional shivering, chills, night sweats, slight loss of appetite, productive cough with copious expectoration of thick dark green discharge with a putrid odor that was very foul smelling (smell “rotten”). Antibiotic therapy (tbl cefixim 400 1x1) was administered for ten days without effect. A large cavernous change (diameter of 10 cm) was seen on the chest X-ray in the projection of the lingula with a level and pronounced pericavernous infiltrate in connection with the heart and the shadow of the lateral thoracic wall. Laboratory analyzes showed an increase in non-specific inflammatory markers (CRP over 200, ref value up to 5), increased SeErc 84

for the first hour, leukocytosis of 13.5/mm3 with a predominance of neutrophils of 95% and a slight increase in D-dimer (1090, ref <500). . Bacteriological confirmation was not obtained from the bronchoaspirate (cultures remained negative after 48 hours of incubation). CT of the chest showed a large abscess formation and consolidation in the lingula with an air bronchogram, and reactively enlarged mediastinal lymph glands. Bronchoscopy showed regular passage to the subsegments, hyperemia of the mucous membrane of the left bronchial tree with abundant whitish secretion coming from the basal segmental mouths. After aspiration, lavage was performed with 500 ml of physiological solution 0.9% NaCl. The procedure was repeated 14 times during the 20-day hospitalization, the control graphy at discharge showed resolution with a decrease in the thickness of the walls and pericavernous infiltrates. X-ray (PA and lateral projection) before the start of therapy During the patient's hospitalization, 14 bronchoscopies were performed with lavage of 500 to 750 ml of physiological solution 0.9% NaCl and aspiration of the contents (bronchoscopic lavage was performed once every 24 hours. Radiographs showed a reduction of the abscess cavity, so that in a period of 14 days a reduction by more than half (from 4 to about 1.5 cm) was observed. The patient's condition improved significantly, the patient was afebrile for the entire time of hospitalization, his appetite returned to normal. After discharge, the medical treatment was extended for the next three months with clindmic at a dose of 600 mg/24 hours.The radiological picture showed complete normalization after three months. X-ray (PA and lateral projection) after three months from the beginning of therapy Case 2. SP, a 70-year-old man, without comorbidities, smokes 5 cigarettes a day, does not consume alcohol. Hospitalized due to cough with expectoration of thick secretions with green purulent and bloody admixtures, high febrility with onset of fever. Symptoms appeared two weeks before admission. The antibiotic treatment did not have a particular effect, which is why hospitalization is indicated. On the radiograph of the chest on the right at the level of the hilus, a round formation with a level and a suspicious view of the drainage bronchus was seen. Chest CT showed a cavitation lesion of approximate size 8.5x7.6 cm with air-liquid level and cellular detritus. Reactively enlarged hilar and paratracheal lymphoglands were also monitored. Laboratory analyzes showed an increase in non-specific inflammatory markers (CRP 184, ref value up to 5), an increased SeErc 106 for the first hour, a leukocytosis of 21.5/mm3 with a predominance of neutophils of 90% and an increase in D-dimer (3080, ref <500). During hospitalization, dual antibiotic treatment (broad-spectrum and anti-anaerobic) with excessive supportive therapy was applied. Clinical improvement was achieved, and slow resolution was observed radiologically. Bronchoscopy showed normal patency to the subsegments. Bronchoscopic lavage was performed 8 times (no pathogens were isolated from the aspirate, bacteriological examination did not show an increase in cultures after incubation). Due to the persistence of radiological changes, a bronchobiopsy and a transbronchial biopsy were performed on two occasions (the histopathological analysis of the samples did not detect malignancy, a specific process or other finding that would fit into a certain clinical entity). The overall finding was consistent with a lung abscess, and repeated lavages helped speed up restitution. Clinical and laboratory improvement was monitored, and changes in the direction of

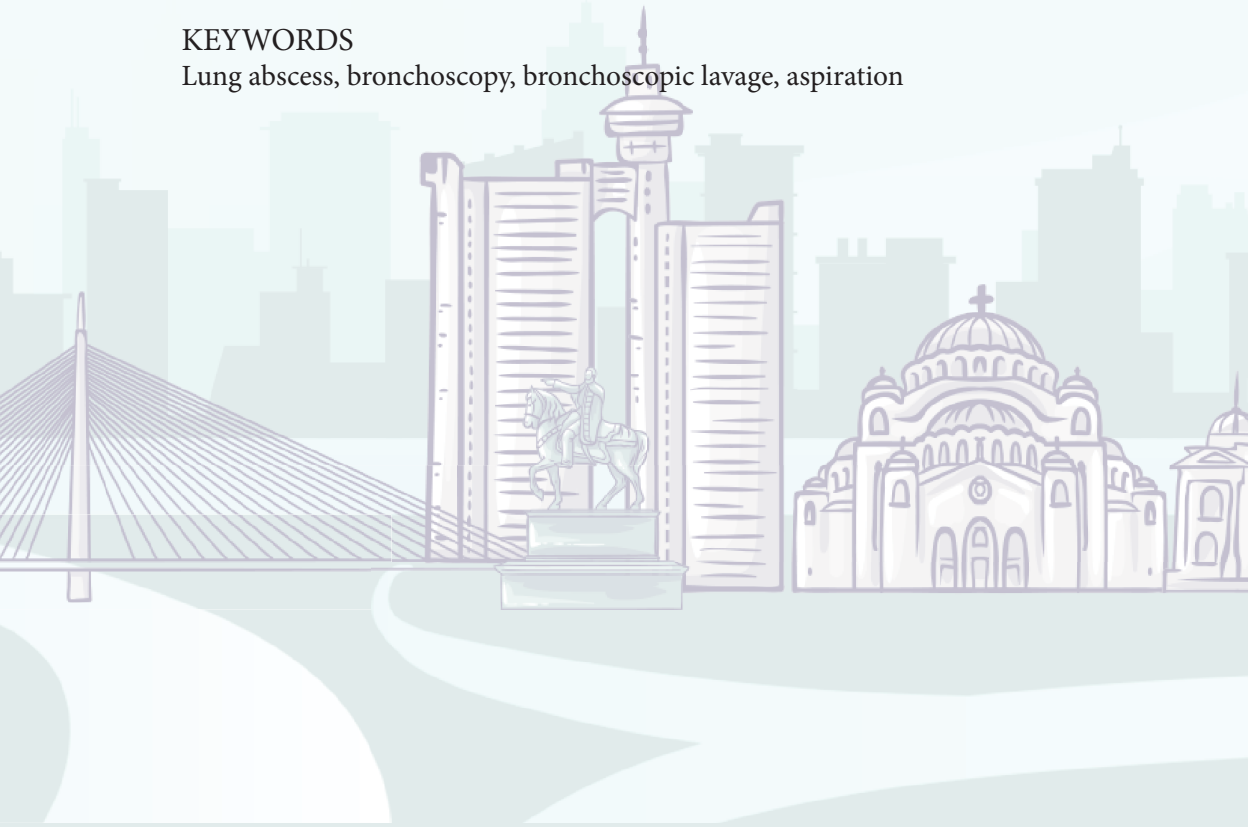
adhesions were monitored X-ray. After discharge, the patient was treated for 3 months with oral clindamycin and a temporary oral steroid regimen in decreasing doses. The patient was monitored for one year after the end of the therapy. No occurrence of fever or any suspicion of recurrence was observed

CONCLUSION

Cases with a lung abscess caused by a complication of pneumonia, in which no bacteriological confirmation was obtained, are presented. Treatment was empiric with dual antibiotics. Bronchoscopic lavage and aspiration of secretions was performed daily within a reasonable range of tolerance. We obtained radiographic regression in the expected time period, thereby confirming the impact and importance of repeated bronchoscopic lavages. By aggressive application of saline solution through the opening of the bronchus of the anatomically affected segment and lobe, a direct washing of the mucous content and detritus was performed, which facilitated the tissue regeneration of the affected part of the lung and achieved ad integrum restitution in the optimal time with reduced residue formation. With the ones shown, we got almost complete radiological resolution. The patients tolerated the intervention and the entire treatment well. Repeated endoscopic lavages with physiological solution had a positive effect and significantly helped conservative treatment.

KEYWORDS

Lung abscess, bronchoscopy, bronchoscopic lavage, aspiration



P07 VENSKI TROMBEMBOLIZAM ,PRVA MANIFESTACIJA KARCINOMA PRIKAZ SLUCAJA

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UVOD

Plućna embolija (PE) potencijalno je po život opasno stanje koje može biti povezano sa značajnim morbiditetom. Tromboza i karcinom su povezani brojnim patofiziološkim mehanizmima; incidenca VTE i stopa recidiva povećani su u populaciji oboljelih od carcinoma u uporedbi s drugim grupama pacijenata. VTE je drugi najčešći uzrok smrti kod pacijenata oboljelih od carcinoma, ali također može biti i početna manifestacija kod pacijenata s okultnim malignitetom. Prikazujemo slučaj sa VTE, gdje je malignitet otkriven kasnije.

PRIKAZ SLUČAJA

Muškarac star 42 godina. U bolnicu je primljen s dispnejom, hemoptizom i bolovima u prsima. Biokemijske pretrage pokazale su blago povišenu CK MB, povećane D-dimere gasne analize hiposaturaciju. CT angiografija prsnog koša pokazala je defekt punjenja desne donje plućne arterije. Nakon prijema pacijent tri dana lecen heparinom ,zatim prebacen na Rivaroxaban.Tekom hospitalizacije došlo je do netraumatskog prijeloma vrata desne butne kosti koji je zbog teske klinicke slike lečena konzervativno. Nakon dva mjeseca dogodila se ponovljena epizoda VTE s istim simptomima i sa dubokom venskom trombozom desne poplitealne vene . Šest tjedana nakon rekurentne PE ortopedski tim je izvršio operaciju zamjene bioprotezom pri čemu je uzet biopsijski materijal. Diferencijalno dijagnoza je bila metastatske koštane naslage vezivnog tkiva . Uragen je CT male zdjelice i uočen je tumor ovalnog oblika u desnoj ilijačnoj regiji.

ZAKLJUČAK

Bolesnici sa VTE izloženi su značajnom riziku od okultne maligne bolesti. Takvim pacijentima treba preporučiti skrining malignih bolesti. U partnerstvu s pacijentom , klinički tim može poboljšati ishode pacijenata uz optimalnu procjenu rizika i usklađenost s nacionalnim i međunarodnim smjernicama za profilaksu i liječenje VTE.

KLJUČNE REČI

Venska tromboembolija, malignitet, diferencijalna dijagnoza

P07 VENOUS THROMBOEMBOLISM, FIRST MANIFESTATION OF CARCINOMA, CASE REPORT

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INTRODUCTION

Pulmonary embolism (PE) is a potentially life-threatening condition that can be associated with significant morbidity. Thrombosis and cancer are linked by numerous pathophysiological mechanisms; the incidence of VTE and the recurrence rate are increased in the carcinoma patient population compared to other patient groups. VTE is the second most common cause of death in patients with carcinoma, but it can also be the initial manifestation in patients with occult malignancy. We present a case with VTE, where the malignancy was discovered later.

CASE REPORT

A 42-year-old man. He was admitted to the hospital with dyspnea, hemoptysis and chest pain. Biochemical tests showed slightly elevated CK MB, increased D-dimer gas analysis, hyposaturation. CT angiography of the chest showed a filling defect of the right lower pulmonary artery. After admission, the patient was treated with heparin for three days, then switched to Rivaroxaban. During hospitalization, a non-traumatic fracture of the neck of the right femur occurred, which was treated conservatively due to the severe clinical picture. After two months, a repeated episode of VTE occurred with the same symptoms and deep vein thrombosis of the right popliteal vein. Six weeks after the recurrent PE, the orthopedic team performed a bioprosthesis replacement operation, during which the biopsy material was taken. The differential diagnosis was metastatic bone deposits of connective tissue. A CT scan of the small pelvis was performed and an oval-shaped tumor was observed in the right iliac region.

CONCLUSION

Patients with VTE are at significant risk of occult malignancy. Screening for malignant diseases should be recommended to such patients. In partnership with the patient, the clinical team can improve patient outcomes with optimal risk assessment and compliance with national and international guidelines for VTE prophylaxis and treatment.

KEYWORDS

Venous thromboembolism, malignancy, differential diagnosis

P08 MULTIDISCIPLINARNI PRISTUP U LEČENJU PACIJENATA SA NEMIKROCELULARNIM KARCINOMOM BRONHA I FUZIJOM GENA ZA KINAZU ANAPLASTIČNOG LIMFOMA (ALK) – PRIKAZ SLUČAJA

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UVOD

Karcinom bronha je jedan od najčešćih uzroka smrtnosti u onkološkoj populaciji. Modaliteti savremenog onkološkog lečenja usmereni su na personalizaciju terapije u cilju da se produži period preživljavanja bez progresije bolesti i period ukupnog preživljavanja pacijenata koji boluju od karcinoma. „*Echinoderm microtubule associated protein like 4 – anaplastic lymphoma kinase*“ (EML4-ALK fuzija ili ALK rearanžman) spada u retke genske alteracije kod karcinoma bronha.

PRIKAZ SLUČAJA

U ovom radu prikazaćemo slučaj pacijenta starosti 36 godina, muškog pola, nepušač, bez prisutnih komorbiditeta. U julu 2020. godine pacijent je povodom tegoba u vidu zamaranja, otežanog disanja i suvog kašlja radiološki evaluiran. Radiološki je verifikovana atipična konsolidacija u levom donjem režnju, anteriorno perihilarno u regiji lingule još jedna ovalna promena dijametra 22x16mm. Medijastinalna limfadenomegalija. Osteoblastična zona VTh7. Sekundarni depozit jetre. Urađena je bronhoskopija dana 04.08.2020. godine, endoskopski verifikovan tumorski proces. Patohistološkom analizom materijala dobijenog bronhobiopsijom sa karine ušća za gornji levi režanj dijagnostikovan je adenokarcinom bronha, kliničkog stadijuma bolesti T4N2M1c. Urađena su molekularna testiranja, EGFR negativan (wild type), PDL1 negativan (0%), ALK – pozitivan. Kod bolesnika je avgusta 2020. godine sprovedena stereotaksična zračna terapija (SBRT) metastatske promene u jetri sa dozom od 30Gy u 5 frakcija, a potom i VMAT (rapidarc) stereotaksična zračna terapija primarnog tumora levog pluća i osteoblastične promene VTh7 u dozi od 30Gy u 12frakcija. U nastavku lečenja dana 09.09.2020. započeta je primena leka Alektinib u prvoj liniji lečenja u dozi od 1200mg dnevno. Pacijent je radiološki evaluiran u periodu na 12 nedelja sa CT grudnog koša, abdomena i endokranijuma u skladu sa RECIST 1.1 kritrijima. Kod pacijenta je inicijalno postignut radiološki odgovor, parcijalna regresija (PR) prema RECIST 1.1 kriterijumu. Zbog diseminacije bolesti intrakranijalno, kod pacijenta je decembra 2021. godine sprovedena VMAT (2Arc) SRS (Stereotactic radiosurgery) na dve lezije levo parijetalno i desno okcipitalno sa dozom 8-12Gy u jednoj frakciji, ukupna doza 12Gy. Nastavljena je primena leka Alektinib u dozi od 1200mg dnevno. U daljem toku lečenja dana aprila 2022. godine zbog novonastalih multiplih intrakranijalnih

promena, sprovedena je VMAT stereotaksična zračna terapija u dozi od 12Gy na dve nodularne promene leve hemisfere malog mozga i supratentorijalne multiple promene. S obzirom na diseminaciju bolesti u centralni nervni sistem kod pacijenta je u daljem toku lečenja započeta primena ALK tirozin kinaza inhibitora 3. generacije, leka Lorlatinib u dozi od 100mg dnevno maja 2022. godine. Pacijent aktuelno i dalje na terapiji lekom Lorlatinib bez ispoljenih neželjenih događaja, ECOG PS 0, bez tegoba. Ukupno do sada aplikovano 23 ciklusa. Radiološkom evaluacijom se verifikuje parcijalna regresija (PR) prema RECIST 1.1 kriterijumu.

ZAKLJUČAK

Multidisciplinarni pristup u lečenju pacijenata sa prisutnim metastatskim nemikrocelularnim karcinomom bronha i verifikovanim retkim molekularnim mutacijama ima značajan udeo u postizanju značajnijeg vremena preživljavanja, kao i vremena do progresije bolesti. Primena ALK tirozin kinaza inhibitora 2. i 3. generacije ima značajniji odgovor na razvijanje rezistencije i penetrantnost u centralni nervni sistem.

KLJUČNE REČI:
ALK fuzija, NSCLC, ALK –TKI

P08 A MULTIDISCIPLINARY APPROACH IN THE TREATMENT OF PATIENTS WITH NON-SMALL CELL LUNG CANCER AND ANAPLASTIC LYMPHOMA KINASE (ALK) GENE FUSION – CASE REPORT

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INTRODUCTION

Lung cancer is one of the most common causes of mortality in the oncology population. Modalities of modern oncological treatment are focused on the personalization of therapy in order to prolong the survival period without disease progression and the overall survival period of patients with cancer. "Echinoderm microtubule associated protein like 4 – anaplastic lymphoma kinase" (EML4-ALK fusion or ALK rearrangement) belongs to rare gene alterations in bronchial cancer.

CASE REPORT

In this paper, we present the case of a 36-year-old male patient, a non-smoker, without comorbidities. In July 2020, the patient was radiologically evaluated due to complaints of fatigue, difficulty breathing, and dry cough. Radiologically, atypical consolidation was verified in the left lower lobe, and another oval lesion measuring 22x16mm anterior perihilar in the lingular region. Mediastinal lymphadenopathy. Osteoblastic zone in VTh7. Secondary deposit in the liver. Bronchoscopy was performed on August 4, 2020, and a tumor process was endoscopically verified. Pathohistological analysis of the material obtained from bronchial biopsy with carina insertion for the upper left lobe diagnosed bronchial adenocarcinoma, clinical stage T4N2M1c. Molecular testing was performed, EGFR negative (wild type), PDL1 negative (0%), ALK-positive. In August 2020, the patient underwent stereotactic radiotherapy (SBRT) for liver metastases with a dose of 30Gy in 5 fractions, followed by VMAT (rapidarc) stereotactic radiotherapy for the primary tumor of the left lung and osteoblastic change VTh7 with a dose of 30Gy in 12 fractions. Treatment continued with the administration of Alectinib as first-line treatment at a dose of 1200mg daily starting on September 9, 2020. The patient was radiologically evaluated every 12 weeks with chest, abdominal, and endocranial CT scans according to RECIST 1.1 criteria. The patient initially achieved a radiological response, partial regression (PR) according to RECIST 1.1 criteria. Due to intracranial disease dissemination, the patient underwent VMAT (2Arc) SRS (Stereotactic radiosurgery) in December 2021 for two lesions left parietal and right occipital with a dose of 8-12Gy in a single fraction, total dose 12Gy. The administration of Alectinib at a dose of 1200mg daily was continued. In the course of further treatment in April 2022, due to newly developed multiple intracranial lesions, VMAT stereotactic radiotherapy was performed at a dose of 12Gy for two nodular

lesions in the left hemisphere of the cerebellum and supratentorial multiple lesions. Considering the dissemination of the disease to the central nervous system, the patient started receiving the 3rd generation ALK tyrosine kinase inhibitor, Lorlatinib, at a dose of 100mg daily in May 2022. Currently, the patient remains on Lorlatinib therapy without any adverse events, ECOG PS 0, and without symptoms. A total of 23 cycles have been administered so far. Radiological evaluation confirms partial regression (PR) according to RECIST 1.1 criteria.

CONCLUSION

A multidisciplinary approach in the treatment of patients with metastatic non-small cell lung carcinoma and verified rare molecular mutations plays a significant role in achieving prolonged survival time, as well as time to disease progression. The use of ALK tyrosine kinase inhibitors of the 2nd and 3rd generations exhibits a significant response in developing resistance and penetrance into the central nervous system

KEYWORDS

ALK fusion, NSCLC, ALK -TKI

P09 BRONHOLOŠKI NALAZ I HIRURŠKO LEČENJE SINHRONIH TUMORA U PLUĆIMA KOD PACIJENTKINJE SA TOTALNIM SITUS INVERSUSOM

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UVOD

Situs inversus je stanje koje je prisutno od rođenja gde su unutrašnji organi zarotirani ili imaju položaj odraza u ogledalu. Ovo utiče na sve glavne strukture u grudnom košu i abdomenu, obično uključujući zaokretanje duž srednje linije tela. Često, osobe sa situs inversus totalis nisu svesne svog jedinstvenog anatomskog stanja sve dok se ne suoče sa medicinskim problemima koji nisu povezani sa ovim stanjem. U ovom prikazu diskutujemo o slučaju četrdesetdevetogodišnje žene sa situs inversus totalis kod koje je dijagnostikovan karcinom pluća u srednjem režnju sa leve strane.

PRIKAZ SLUČAJA

Četrdesetdevetogodišnja žena, dugogodišnji pušač sa prethodnom istorijom karcinoma desne dojke i hroničnom obstruktivnom bolesti pluća, javila se u našu ustanovu sa tumorom u gornjem i srednjem režnju pluća sa leve strane, otkrivenim CT i PET/CT pregledima. CT nalaz je pokazao postojanje anatomske promene u rasporedu unutrašnjih organa po tipu situs inversus totalis. Stanje nakon mastektomije desne dojke. Takođe je evidentirana promena veličine 3,3 cm u gornjem režnju pluća sa leve strane, promena veličine 4,6 cm u srednjem režnju levo, limfni čvor veličine 0,12 cm na poziciji 11L. PET/CT pregled je pokazao pozitivnu aktivnost i u limfnom čvoru na poziciji 2L. Bronhoskopija je potvrdila situs inversus i identifikovala tumor koji potpuno opstruiše bronh za srednji režanj sa leve strane. Kako patohistološkom analizom bioptičkih materijala nije utvrđena priroda oboljenja u daljem toku je urađena transtorakalna aspiraciona iglena biopsija tumorske promene lokalizovane u gornjem režnju levog plućnog krila. Citopatološkom analizom uzetog materijala viđene su ćelije adenokarcinoma. Stadijum bolesti je okarakterisan kao cT1cN0M0, pogodan za operativno lečenje. Urađena je leva gornja bilobektomija. Disekcija limfnih čvorova na pozicijama 2L, 4L, 8L, 9L, 10L i 11L pokazala je reaktivne čvorove bez prisustva metastatskih malignih ćelija. Definitivan patohistološki nalaz potvrđuje da promena iz srednjeg režnja na prvom mestu primarnom plućnom adenokarcinomu, dok promena iz gornjeg režnja odgoavara metastatskom karcinomu porekla dojke.

ZAKLJUČAK

Ovaj slučaj je jedinstven u našoj ustanovi, budući da je to prvi slučaj gde su karcinom pluća, metastaza karcinoma dojke i situs inversus totalis istovremeno prisutni i hirurški lečeni. Situs inversus totalis je izuzetno retko stanje na koje kliničari

treba da obrate pažnju. Razumevanje ovih kongenitalnih varijacija je ključno, posebno u hirurškim, intubacionim i bronhoskopskim procedurama. Rano prepoznavanje situs inversus totalis je od vitalnog značaja za efikasno planiranje lečenja. Različiti dijagnostički postupci poput rendgenskih snimaka grudnog koša, CT skenova, MRI-a, PET/CT skenova, bronhoskopije, ultrazvuka, ehokardiografije i angiografije mogu potvrditi dijagnozu. Ovaj slučaj ističe istovremenu prisutnost situs inversus totalis, karcinoma pluća u levom srednjem režnju i metastaze karcinoma dojke u levom gornjem režnju, koji je uspešno hirurški lečen. Pretraživanjem dostupne naučne literature, nismo pronašli dokumentovane slučajeve sa ovakvim stanjima i tretmanom, zbog toga smatramo da je značajno prikazati ovaj slučaj.

KLJUČNE REČI
Situs inversus totalis, karcinom pluća, srednji režanj levo, leva gornja bilobektomija

P09 BRONCHOSCOPIC FINDINGS AND SURGICAL TREATMENT OF SYNCHRONOUS LUNG TUMORS IN A PATIENT WITH TOTAL SITUS INVERSUS

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INTRODUCTION

Situs inversus is a condition present from birth where the major internal organs are flipped or mirrored from their usual spots. This affects all major structures in the chest and abdomen, typically involving a simple reversal along the body's midline. Often, individuals with situs inversus totalis aren't aware of their unique anatomy until they encounter medical issues unrelated to this condition. In this article, we intend to discuss the case of a 49-year-old woman with situs inversus totalis who has been diagnosed with lung cancer.

CASE REPORT

A 49-year-old woman, a long-time smoker with a history of right breast cancer and COPD, came to our department with a tumor in the left upper and middle lung lobes, as detected by CT and PET/CT scans. The CT scan revealed an anatomically reversed internal organ arrangement. She had previously undergone right-side mastectomy. The CT scan also showed a 3.3 cm nodule in the left upper lobe, a 4.6 cm nodule in the middle lobe, and a 0.12 cm lymph node in area 11L. The PET/CT scan indicated positive activity in lymph node 2L. A bronchoscopy confirmed the situs inversus and identified a tumor fully blocking the bronchus in the left middle lobe. However, endobronchial biopsies were inconclusive, so a fine needle biopsy was performed on the left upper lobe tumor, revealing non-small cell adenocarcinoma. Preoperative staging suggested cT1cN0M0, and the patient was deemed suitable for surgery. A left upper bilobectomy was performed successfully, with the mirrored anatomy of the left lung facilitating the procedure. Lymph node dissection in areas 2L, 4L, 8L, 9L, 10L, and 11L showed reactive nodes without cancer metastasis. Final histology confirmed adenocarcinoma in the left upper lobe and metastasis of breast carcinoma in the middle lobe.

CONCLUSION

This particular patient represented a unique case in our surgery department, being the first instance where lung cancer, breast cancer metastasis, and situs inversus totalis coexisted and were surgically managed. Situs inversus totalis is an exceedingly rare condition that clinicians should be aware of. Understanding these congenital variations is crucial, especially in surgical, intubation, and bronchoscopy procedures. Early diagnosis of situs inversus totalis is vital for effective treatment planning. Various diagnostic tools such as chest X-rays, CT scans, MRIs, PET/CT scans, bronchoscopies,

ultrasonography, echocardiography, and angiography can confirm the diagnosis. This case highlights the simultaneous presence of situs inversus totalis, lung cancer in the left middle lobe, and breast cancer metastasis in the left upper lobe, all of which were successfully treated surgically. Upon reviewing existing scientific literature, we found no other documented cases with similar conditions and treatments, underscoring the significance of presenting this case.

KEYWORDS
Situs inversus totalis, lung cancer, left middle lobe, left upper bilobectomy

P10 ENDOBROHIJALNI LIPOM: MULTIDISCIPLINARNI PRISTUP DIJAGNOZI I LEČENJU

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UVOD

Endobronhijalni lipom je redak, benigni tumor koji dovodi do opstrukcije disajnog puta na mestu nastanka, praćenu oštećenjem plućnog parenhima. Klinička prezentacija često imitira onu koja se može videti kod opstruktivnih bolesti pluća te je odgovarajuća imidžing dijagnostika neophodan prvi korak u dijagnostici.

PRIKAZ SLUČAJA

Pacijent (74 godine) hospitalizovan u Institutu za plućne bolesti Vojvodine (IPBV) sa tegobama u vidu kašlja i sviranja u grudima. Urađena spirometrija i ordinirana inhalatorna dezopstruktivna terapija. Urađen RTG i CT pregled toraksa – nalaz opisuje da se u lumenu intermedijernog bronha uočava nehomogena promena, dijametra oko 10mm, koja se održava i u postkontrastnoj studiji pregleda i u prvom redu odgovora intraluminalnoj leziji. Urađene su dve bronhoskopije. Endoskopski opisan tumorski proboj na ekstramuralnoj kompresiji u distalnom delu intermedijernog bronha. Srednji se eksploriše ali se ispod tumora ka bazi ne prolazi. Patohistološkom analizom uzoraka dobijenih bronhobiopsijom opisane promene potvrđena je dijagnoza endobronhijalnog lipoma. Urađena je interventna procedura, argon plazma koagulacija, sa uklanjenjem dela lipoma iz početka ušća za donji režanj. Nakon intrevencije ušće za srednji slobodno, ušće za DB6 slobodno i načinjen manji otvor prema desnom donjem. Zaostaje deo lipoma koji zatvara ušće za bazu. Nakon šest nedelja urađen kontrolni CT pregled toraksa kojim se registruje da je desni donji lobus smanjenog volumena usled prisustva manje zone atelektaze koja se ne može jasno odvojiti od nepravilne hiperdenzne zone (3 cm) koja opturiše početne pripadajuće bronhe i bronh za S6 čiji lumen se većim delom ne vizualizuje. Kontrolna bronhoskopija: kompresija u distalnom delu intermedijernog koga ne zatvara u potpunosti. Srednji sa širom karinom ali slobodnih ušća. Ušća za DB7-10 se ne prikazuju, a DB6 je slobodan. Nakon kompletno sprovedene funkcionalne procene slučaj bolesnika prikazan je multidisciplinarnom timu IPBV koji indikuje operativno lečenje.

ZAKLJUČAK

Endobronhijalni lipom je redak, benigni tumor pluća – sa potencijalno problematičnom lokalizacijom. Često zahteva multidisciplinarni pristup dijagnozi i lečenju.

KLJUČNE REČI

Argon plazma koagulacija; bronhoskopija; bronhijalna opstrukcija; endobronhijalni lipom; tumor pluća

P10 ENDOBRONCHIAL LIPOMA: MULTIDISCIPLINARY APPROACH TO DIAGNOSIS AND TREATMENT

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INTRODUCTION

Endobronchial lipoma is a rare, benign tumor that can lead to the obstruction of airways and subsequent damage to lung parenchyma. Clinical presentation can mimic obstructive pulmonary diseases, hence imaging studies are the necessary first step in the diagnostics.

CASE REPORT

Male patient (74 y/o) was hospitalized at the ward of the Institute for Pulmonary Disease of Vojvodina with cough and wheezing. Spirometry was performed and due to bronchial obstruction therapy was prescribed. Chest X-ray followed by computed tomography (CT) was performed in subsequent diagnostics. An intraluminal lesion was reported in the right intermediary bronchus, 10 mm in diameter; the lession was described in both pre- and post-contrast studies. Further diagnostic algoritm included two bronchoscopies – endoscopic finding during both procedures describing infiltrative-like lesion on the top of the extrinsic compression in the distal part of intermediary bronchus. The middle lobe bronchus could be accessed but the bronchoscope could not be advanced to the right lower lobe. The patohistological analysis confirmed endobronchial lipoma in all the biopsies of the lesion. Bronchoscopic debulking with argon plasma coagulation was performed, and a part of the lipoma was removed. After the intervention the middle lobe bronchus was accessible, RB6 was also accessible, the patency was sufficient for maintaining communication to the basal buquet; but a part of the lipoma which obstructs sublobar part of the right base persisted. After 6 weeks a control CT exam was performed; imaging studies described that the volume of the right lower lobe was decreased due to area of atelectasis that could not be differentiated from a hyperdense area (around 3 cm in diameter) that is obturating the surrounding bronchi including the bronchus for RB6 whose lumen can not be fully visualized. CT exam was followed by bronchoscopy. Compression was seen in the distal part of the intermediary bronchus. Carina of the middle lobe bronchus was widend. Orifices for RB7-10 could not be seen and RB6 was again reachable. Complete preoperative functional assessment was done and the case was presented to the institutional multidisciplinary board which recommended a surgical treatment.

CONCLUSION

Endobronchial lipoma is a rare benign tumor of the lung – with potentially problematic localization. In many cases it requires a multidisciplinary approach to diagnosis and treatment.

KEYWORDS

Argon plasma coagulation; bronchoscopy; bronchial obstruction; endobronchial lipoma; lung tumor

P11 ENDOSKOPSKA PLUĆNA EKSTRANODALNA PREZENTACIJA KRUPNOĆELIJSKOG B LIMFOMA – PRIKAZ SLUČAJA

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UVOD

Limfoproliferativne bolesti često daju svoje ekstranodalne lezije, ali retko su prezentovane kao plućna forma i obuhvataju oko 1 % svih plućnih neoplazmi. Plućna forma Non – Hodgkin limfoma je veoma retka i obuhvata 3 – 4% svih ekstranodalnih manifestacija.

PRIKAZ SLUČAJA

Pacijentkinja stara 71 godinu javlja se na pregled pulmologu zbog kašlja, gubitka u telesnoj težini, malaksalosti i povremenog noćnog preznojavanja u trajanju od 6 meseci. Nepušač je, hipertoničar, daje podatak da je zbog splenomegalije ispitivana od strane hematologa pre 5 godina ali tada nije bila utvrđena hematološka bolest. Skenerom grudnog koša, abdomena i karlice zabeleženo je bilateralno više nodularnih promena plućnog parenhima po tipu sekundarnih depozita, kao i dve veće infiltrativne promene, okvirnih dimenzija desno 5x6 centimetara (cm), levo 4x5cm. Opisana je i patološka medijastinalna limfadenopatija i uvećana slezina sa više hipodenznih, nejasno ograničenih promena, takođe suspektnih na sekundarne depozite. Kako bismo ustanovili etiologiju opisanih promena, učinjena je bronhoskopija. Endoskopski nalaz ukazao je na postojanje ružičaste tumorske mase koja potpuno zatvara ušće bronha za bazalni buket desno. Endobronhijalnom biopsijom uzorkovano je tkivo za patohistološku dijagnostiku. Patohistološkim analizama dokazan je difuzni B krupnoćelijski limfom, te je bolesnica upućena hematologu radi daljeg lečenja.

ZAKLJUČAK

Ekstranodalna plućna prezentacija krupnoćelijskog B limfoma zbog svoje raznolike kliničke i radiološke prezentacije, kao i nespecifične simptomatologije, zahteva patohistološku verifikaciju, najpre kako bi se isključio primarni plućni karcinom. Obzirom i na raznoliku endoskopsku prezentaciju, bronhoskopija sa biopsijom je najčešća metoda izbora za uzorkovanje tkiva i materijala.

KLJUČNE REČI

Endobronhijalna, ekstranodalna, limfom, bronhoskopija, tumor

P11 ENDOSCOPIC PULMONARY EXTRANODAL PRESENTATION OF LARGE B-CELL LYMPHOMA – CASE REPORT

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INTRODUCTION

Lymphoproliferative diseases are often presented as extranodal lessions, rarely in a pulmonary form. They are representing 1% of all pulmonary neoplasms. Pulmonary form of Non – Hodgkin lymphoma is very rare, with the rate of 3 – 4% of all extranodal manifestations.

CASE REPORT

Female patient, 71 years old, was examined by pulmonologist due to chronic cough, progressive weight loss, weakness and sweating at night over the past six months. She was a nonsmoker, with medical history of elevated blood pressure and hematological evaluation conducted 5 years ago due to uncertain etiology of splenomegaly. Computed tomography (CT) scan of chest, abdomen and pelvis showed bilateral nodular lessions of lung parenchyma suspected for secondary deposits, two larger infiltrative lessions, right sized 5x6 centimeters (cm), left sized 4x5cm. It also showed pathologically enlarged mediastinal lymph nodes and enlarged spleen with multiple hypodense lessions, also suspected for secondary deposits. To determine the etiology of CT findings, bronchoscopy was performed. Endoscopic findings showed the presence of pink tumor mass completely obstructing bronchus for right basal bouquet. After the biopsy of the mass, pathohistological examination was performed and it confirmed the presence of Diffuse Large B-cell Lymphoma, so the patient was referred to a haematologist for further treatment.

CONCLUSION

Extranodal pulmonary presentation of Diffuse Large B-cell Lymphoma due to its diversity in clinical and radiology findings, also showing nonspecific symptomatology, demands pathohistological verification, firstly to exclude primary pulmonary carcinoma. Considering its variety in endoscopic presentation, bronchoscopy with biopsy is the most common method for sampling the tissue.

KEYWORDS

Endobronchial, extranodal, lymphoma, bronchoscopy, tumor

P12 DIFERENCIJALNA DIJAGNOSTIKA PLUĆNIH KAVITACIJA: ZNAČAJ BRONHOSKOPSKE DIJAGNOSTIKE

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UVOD

Plućna šupljina definiše se kao plućna lezija ispunjena gasom, bez plućne konsolidacije, mase ili nodula, ograničena nepravilnim zidovima različite debljine. Šupljine mogu biti pojedinačne ili multiple, a najčešće nastaju eliminacijom nekrotičnih delova plućnog parenhima putem bronhijalnog stabla. Mogu biti neoplastične (kavitirajući primarni ili metastatski tumor), infektivne (tuberkuloza, hidatidna cista, apsces, pneumonija, aspergiloza), kongenitalne i druge etiologije (granulomatoza sa poliangitisom, pneumatocele).

PRIKAZ SLUČAJA

Pacijent starosti 75 godina hospitalizovan je radi dopunske dijagnostike sa radiografskom sumnjom na postojanje kavitacije u desnom i tumorske promene u levom plućnom krilu. Od tegoba navodi kašalj sa otežanim iskašljavanjem i povremene probadajuće bolove u grudima. MSCT eksploracijom se potvrđuje ekskavirana lezija zadebljalih zidova dij. 48x98.5x43 mm u gornjem režnju desnog plućnog krila koja ostvaruje komunikaciju sa desnim glavnim bronhom. U levom plućnom krilu je opisana tumorska promena anteriornog segmenta, sa inkluzijom vazduha. Obe promene pokazuju heterogeno PKPD. Fiberoptičkom bronhoskopijom evidentira se destruirana karina bronha za desni gornji režanj, kao i lateralni zid intermedijalnog bronha. Bronh za gornji režanj ne postoji, te se iz desnog glavnog bronha odmah dospeva do parenhimske šupljine čiji su zidovi delom nekrotičnog tkiva, delom sa lakim krvarenjem, bez eksudata. Levo su ušća za LB1+2 i LB3 stenozirana i infiltrovana sa patološkom vaskularizacijom i spontanim krvarenjem. Uzorkovano je: EBB sa infiltrovane sluzokože desnog glavnog bronha i sa ostataka karine bronha za desni gornji lobus, EBB sa stenoziranog ušća LB3, ENAB iz ostatka karine za desni gornji lobus, FBA iz kavitacije desnog gornjeg režnja. Mikrobiološki i mikobakteriološki pregled sputuma i fiberbronhoaspirata bili su negativni. Patohistološkom analizom svih uzorkovanih biopsata i citoblokom FNAB dokazan je Carcinoma squamocellulare keratodes invasivum pulmonis G2. Proces je bio neresektabilan, a pacijent nemotivisan za dalje lečenje.

ZAKLJUČAK

Kavitacije u primarnom plućnom karcinomu nisu retke. Skvamocelularni karcinom je najčešći histološki tip karcinoma pluća sklon kavitacijama.

KLJUČNE REČI

Plućna šupljina, kavitirajući tumor, skvamocelularni karcinom

P12 DIFFERENTIAL DIAGNOSIS OF PULMONARY CAVITIES: THE ROLE OF BRONCHOSCOPY

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INTRODUCTION

A pulmonary cavity is defined as a gas-filled space within a zone of pulmonary consolidation or within a mass or nodule, bounded by irregular walls of varying thickness. Cavities may be single or multiple and usually occur when central necrotic tissue is expelled via a bronchial connection. Pulmonary cavities may be the result of malignancy (primary bronchogenic carcinoma, cavitating pulmonary metastases), infection (tuberculosis, hydatid cyst, abscess, pneumonia, aspegillosis), inflammation (granulomatosis with polyangiitis) or be congenital.

CASE REPORT

A 75-year-old patient was hospitalized after radiography for further diagnosis, with the suspicion of cavitation in the right and tumor changes in the left lung. Cough with difficult expectoration and occasional stabbing chest pains were present. MSCT exploration confirms an excavated lesion with thickened walls dia. 48x98.5x43 mm in the upper lobe of the right lung, which communicates with the right main bronchus. A tumoral change in the anterior segment, with air inclusion, was described in the left lung. Both changes show heterogeneous PKPD. Bronchological examination revealed destruction of the bronchus carina for the right upper lobe as well as the lateral wall of the intermediate bronchus. The bronchus for the upper lobe does not exist, and from the right main bronchus it immediately reaches the parenchymal cavity, the walls of which are partly necrotic tissue, partly with light bleeding, without exudate. Bronchial orifices of LB1+2 and LB3 are stenosed and infiltrated with pathological vascularization and spontaneous bleeding. The following were sampled: EBB from the infiltrated mucosa of the right main bronchus and from the remains of the carina of the bronchus for the right upper lobe, EBB from the stenosed ostia of LB3, ENAB from the remnant of the carina for the right upper lobe, FBA from the cavitation of the right upper lobe. Microbiological and mycobacteriological examination of the sputum and bronchial aspirate were normal. The histopathology examinations of transbronchial biopsies and cytobloc FNAB proved Carcinoma squamocellulare keratodes invasivum pulmonis G2. The process was unresectable and the patient was unmotivated for treatment.

CONCLUSION

Cavitation in primary lung cancer is not rare. Squamous cell carcinoma is the most common histological type of cavitation-prone lung cancer.

KEYWORDS

Pulmonary cavity, cavitating carcinoma, squamous cell carcinoma

P13 BRONHOSKOPIJA: PUT KA DIJAGNOZI I 'PREPREKA' KA TERAPIJI – PRIKAZ PACIJENTA SA BAZALOIDNIM SKVAMOCELULARNIM KARCINOMOM LARINKSA

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UVOD

Bazaloidni skvamocelularni karcinom predstavlja retku agresivnu formu maligne neoplazme pri čemu terapijski pristup nije u potpunosti standardizovan, a prognoza je neizvesna. Cilj rada je da kroz prikaz slučaja pacijenta ukažemo na značaj bronhoskopije u dijagnostici i terapijskom izboru kod ove bolesti.

PRIKAZ SLUČAJA

Muškarac starosti 72 godine javlja se na pregled pulmologu sa tegobama u vidu promuklosti i povremenog iskašljavanja sukrvičavog sadržaja. Nakon inicijalne radiografije pluća i srca, indikovan je MSCT toraksa i gornjeg abdomena i verifikovana mekotkivna tumorska masa 56x45 mm u lingularnom segmentu levog pluća koja širokom osnovom naleže na pleuru. Bronhoskopijom se vizuelizuje neoplastična promena larinksa koja se nadnosi nad rimu glotisa zbog čega je indikovano dalje sagledavanje od strane otorinolaringologa. Predložena laringomikroskopija sa biopsijom je urađena nakon šest nedelja usled odloženog pristanka pacijenta, a patohistološki nalaz potvrđuje bazaloidni skvamocelularni karcinom larinksa. CT pregledom endokranijuma su verikovani multipli sekundarni depoziti kao uzrok novonastale levostrane hemipareze i indikovana je palijativna zračna terapija. Konzilijum otorinolaringologa indikuje bronhoskopsku biopsiju neoplastične mase u levom pluću radi odluke o daljoj onkološkoj terapiji, ali je dopunski dijagnostički postupak ograničen pogoršanjem opšteg stanja pacijenta.

ZAKLJUČAK

Imajući u vidu mogućnost udruženog postojanja karcinoma pluća i larinksa, za preciznu dijagnozu i adekvatnu terapiju potreban je multidisciplinarni pristup u kome pravovremena odluka o modalitetu biopsije plućnih lezija ima ključnu odluku.

KLJUČNE REČI

Karcinom larinksa, neoplazma pluća, biopsija

P13 BRONCHOSCOPY: A WAY TO DIAGNOSIS AND „BARIER" TO THERAPY – A CASE REPORT OF A PATIENT WITH BASALOID SQUAMOUS CELL CARCINOMA OF THE LARYNX

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INTRODUCTION

Basaloid squamous cell carcinoma is a rare aggressive form of malignant neoplasm, where the therapeutic approach is not fully standardized and the prognosis is uncertain. Presenting the case, we aimed to emphasise the importance of bronchoscopy in the diagnosis and therapeutic algorithm of this disease.

CASE REPORT

A 72-year-old man presents to a pulmonologist with complaints of hoarseness and occasional hemoptysis. After the initial radiography, MSCT of the chest and upper abdomen was done revealing a soft tissue tumor mass of 56x45 mm in the lingular segment of the left lung. Bronchoscopy reveals a neoplastic formation of the larynx that covers the glottis opening, so further examination by an otorhinolaryngologist is indicated. The proposed laryngomicroscopy with biopsy was performed after six weeks due to the patient's delayed consent, and the pathohistological finding confirmed basaloid squamous cell carcinoma of the larynx. A CT scan of the endocranium confirmed multiple secondary deposits as the cause of the new-onset left hemiparesis, and palliative radiation therapy was prescribed. Bronchoscopic biopsy of the neoplastic mass in the left lung was indicated in order to decide on further oncological therapy, but the additional diagnostic procedures are limited by the patient's general condition worsening.

CONCLUSION

Considering the possibility of the concurrently existence of lung and larynx cancer, a multidisciplinary approach is required for accurate diagnosis and adequate therapy, in which a timely decision on the modality of lung lesions biopsy is a key.

KEYWORDS
Carcinoma of the larynx, lung neoplasm, biopsy

P14 ASPIRACIJA STRANOG TELA UDRŽENA SA NALAZOM PLUĆNIH KAVITACIJA UZROKOVANIH KLEBSIELLOM PNEUMONIAE

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UVOD

Aspiracija stranog tela je urgentno stanje sa mogućim mortalitetom. Najčešći simptomi su asfiksija, sa ili bez potpune opstrukcije disajnih puteva, kašlj i gušenje. Radiografija pluća je neophodna, ali je bronhoskopija zlatni standard za dijagnozu i lečenje. Klebsiella pneumoniae je čest uzročnik nozokomijalnih pneumonija i pneumonija stečenih u zajednici. Ova gram negativna bakterija može izazvati masivnu plućnu nekrozu i česte kavitacije. Plućne infekcije uzrokovane Klebsiellom pneumoniae mogu se manifestovati hemoptizijama, a radiološki oponašati tuberkulozu.

PRIKAZ SLUČAJA

Pacijent star 41 godinu, štićenik doma za smeštaj odraslih lica, primljen je u Reanimacioni centar Univerzitetskog kliničkog centra Niš zbog desaturacije i sumnje na aspiraciju tečne hrane. Na MSCT-u pluća opisane su kavitarne senke u apikalnom i posteriornom segmentu gornjeg lobusa desno, promera 40mm, debljine zida 3mm. Slična promena manjih dimenzija (28x12mm, debljine zida 8mm) opisana je u srednjem režnju. Zbog sumnje na aspiraciju stranog tela uradjena je fiberoptička bronhoskopija. U desnom bronhijalnom stablu viđen je grumuljičasti gnojav sekret. Ostala ušća su bila slobodna i prolazna do subsegmenatnog nivoa. Gnojav sekret viđen je u lumenu levog glavnog bronha i oko ušća za gornji režanj. U segmentnom ušću donjeg režnja levo uočeno je strano telo koje je u potpunosti opturiralo lumen bronha. Strano telo je ekstrahovano pomoću korpe i hvataljki za ekstrakciju. Nakon ekstrakcije, strano telo je ličilo je na zrno graška ili pasulja. Iz fiberaspirata izolovana je Klebsiella pneumoniae ESBL (extended-spectrum β-lactamases) senzitivna samo na karbapeneme, kojima je započeto lečenje. Na primenjenu terapiju doslo je do poboljšanja opšteg stanja i pada vrednosti markera inflamacije.

ZAKLJUČAK

Prikazan je slučaj aspiracije stranog tela kod pacijenta sa nekrotičnim promenama i kavitacijama u plućima uzrokovanim kolonizacijom Klebsiella pneumoniae. Ove promene se mogu dovesti u vezu sa prethodnim aspiracionim pneumonijama.

KLJUČNE REČI

Strano telo, Klebsiella pneumoniae, pneumonija, nekroza, kavitacije

P14 FOREIGN BODY ASPIRATION ASSOCIATED WITH THE FINDING OF PULMONARY CAVITATIONS CAUSED BY KLEBSIELLA PNEUMONIAE

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INTRODUCTION

Aspiration of a foreign body is an emergency with possible mortality. The most common symptoms are asphyxia, with or without complete airway obstruction, coughing and choking. Chest radiography is essential, but bronchoscopy is the gold standard for diagnosis and treatment. Klebsiella pneumoniae is a common cause of nosocomial and community-acquired pneumonia. This gram-negative bacterium can cause massive pulmonary necrosis and frequent cavitations. Pulmonary infections caused by Klebsiella pneumoniae can manifest as hemoptysis and radiologically mimic tuberculosis.

CASE REPORT

A 41-year-old patient, a resident of a home for adults, was admitted to the resuscitation unit of the University Clinical Center Nis due to desaturation and suspected aspiration of liquid food. On the MSCT of the lungs, cavitary shadows were described in the apical and posterior segment of the upper lobe on the right, diameter 40 mm, wall thickness 3 mm. A similar change of smaller dimensions (28x12mm, wall thickness 8mm) was described in the middle lobe. Due to the suspicion of aspiration of a foreign body, a fiberoptic bronchoscopy was performed. A lumpy purulent secretion was seen in the right bronchial tree. Other orifices were free and passable up to the subsegmental level. A purulent secretion was seen in the lumen of the left main bronchus and around the confluence for the upper lobe. A foreign body was observed in the segmental orifice of the lower lobe on the left, which completely obturated the lumen of the bronchus. The foreign body was extracted using a basket and extraction forceps. After extraction, the foreign body looked like a pea or bean. Klebsiella pneumoniae ESBL (extended-spectrum β-lactamases) sensitive only to carbapenems, with which treatment was started, was isolated from the fiber aspirate. The applied therapy led to an improvement in the general condition and a decrease in inflammation markers.

CONCLUSION

A case of foreign body aspiration in a patient with necrotic changes and cavitations in the lungs caused by Klebsiella pneumoniae colonization is presented. These changes can be related to previous aspiration pneumonias.

KEYWORDS

Foreign body, Klebsiella pneumoniae, pneumonia, necrosis, cavitations

P15 MULTIDISCIPLINARNI PRISTUP U DIJAGNOSTICI I LEČENJU TIMOMA

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UVOD

Hirurgija predstavlja jedan od terapijskih, ali i dijagnostičkih metoda kada drugi modaliteti nisu mogući. Iako se često povezuje sa povišenim rizikom, hirurgija predstavlja metodu kojom je moguće uzeti najadekvatniji uzorak radi citološke i patohistološke dijagnostike. Timus predstavlja limfoidni organ koji se nalazi u prednjem medijastinumu, ima značajnu ulogu u imunitetu posredovanim T limfocitima i nastaje iz parnog epitelijalnog dela faringealnog nabora. Timomi predstavljaju najčešći tumor koji se nalazi u prednjem delu medijastinuma, i ne postoji jasna razlika između benignih i malignih timoma osim u kliničkom ponašanju. Iako su retki u kliničkoj praksi, timomi su realtivno spororastući tumori, a kada se otkriju u ranom stadijumu imaju odličnu prognozu i ukupno preživljavanje. Klasifikacija timoma se prethodno delila prema Masaoka Koga klasifikaciji na stadijume I do IV u odnosu na tumore ograničene kapsulom, invaziju okolnih struktura i udaljene metastaze, a u novom 8. izdanju TNM klasifikaciji su i tumomi uvršteni u klasifikaciju po TNM statusu, a stadijumi bolesti se klasifikuju od I do IVB. Lečenje timoma zavisi od stadijuma bolesti. Kod prvog stadijuma je dovoljna samo hirurška resekcija tumora, dok se kod viših stadijuma bolesti lečenje sprovodi prema protokolu: hemioterapija kao i radioterapija nakon operativnog lečenja/dijagnostike.

PRIKAZ SLUČAJA

Pacijent starosti 45 godina, dobrog opšteg stanja ECOG PS 1, se javio svom izabranom lekaru zbog tegoba u vidu perzistentnog suvog kašlja, kada je urađen RTG i CT grudnog koša gde je viđena promena paraaortalno u 6. grupi dij. 49x38x46mm, bez signifikantne limfadenomegalije. Urađena je dodatno ezofagogastroduodenoskopija koja je bila urednog nalaza, kao i scintigrafija skeleta koja je takođe bila urednog nalaza. Pacijent je hospitalizovan na Klinici za grudnu hirugiju radi biopsije tumora. Urađena je anterolateralna torakotomija, viđen je gornji režanj koji je srastao uz perikard i medijastinalnu pleuru. Urađena je adheozioliza tupom i oštrom preparacijom, te se naišlo na tumorsku promenu u gornjem režnju levog pluća, veličine oraha koja infiltriše perikard, n. Phrenicus i gornju plućnu venu. Ex tempore patohistološkim pregledom biopsije je dobijeno da je preparat maligni, a definitivnom patohistološkom analizom je dobijen nalaz timoma stadijuma T3N0M0 (Masaoka stadijum III). Indikovana je prva linija hemioterapije prema CAP protokolu u 4 ciklusa. S obzirom na odličnu regresiju veličine tumora, kao i dobro opšte stanje pacijenta nakon sprovedene kompletne hemioterapije, indikovana je radioterapija i bolesnik je obrađen za konformalnu

radioterapiju sa dozom na PTV od 60Gy/30fr. Kontrolni CT grudnog koša nakon sprovedene radioterapije je pokazao kompletnu regresiju tumora, dok je pacijent i dalje bio dobrog opšteg stanja.

ZAKLJUČAK

Dijagnostika i lečenje timoma se treba sprovoditi u okviru multidisciplinarnog tima koji se sastoji od hirurga, interniste onkologa i radijacionog onkologa sa individualnim pristupom za svakog pacijenta pojedinačno.

KLJUČNE REČI

Timom, hirurgija, hemioterapija, radioterapija, maligni tumor

P15 A MULTIDISCIPLINARY APPROACH IN THE DIAGNOSTICS AND TREATMENT OF THYMOMA

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INTRODUCTION

Surgery represents one of the therapeutic, as well as diagnostic methods when other methods are unavailable. Although surgery is commonly associated with a greater risk, it is the method to get the most adequate sample for cytological and pathohistological analysis. Thymus is a lymphoid organ located in the front mediastinum, plays a crucial role in T lymphocytes mediated immunity and is developed from the dual epithelial pharyngeal folds. Thymomas represent the most common tumor located in the upper mediastinum and there is not a clear distinction between benign and malignant thymomas except their clinical manifestation. Although rare in clinical practice, thymomas are a relatively slow growing group of tumors, and if found in the early stage have a good prognosis and long overall survival rate. Classification of thymomas was previously done according to the Masaoka Koga classification from stages I do IV in regard of tumors limited by the capsule, invasion of surrounding tissue and distant metastasis, and in the new 8th edition of the TNM classification, thymomas have also been staged according to the TNM status, and stages are classified from the I to the IVB. Treatment of thymomas depends of the stadium of the disease. At stage I surgical resection is only needed, while at later stages treatment is done according to protocol with chemotherapy and radiotherapy after surgical treatment/diagnostics.

CASE REPORT

A male patient of 45 years, good overall performance status ECOG PS 1, has reported to his family doctor that he has a persistent dry cough, an X ray and CT scan of the chest was made and there was a formation in group 6 size of 49x38x46mm, without enlarged lymph nodes. Also, an esophagogastroduodenoscopy was done which was normal as well as an osteoscan which was also normal. The patient was hospitalized at the Clinic for thoracic surgery for a biopsy of the formation. An anterolateral thoracotomy was done, where the upper left lung lobe was moved, and there was a tumorous like formation which was the size of a nut and was infiltrating the pericardium, n. Phrenicus and Superior Vena Cava. Ex tempore pathohistological analysis of the biopsy was malignant, and the definitive pathohistological analysis showed that it was a thymoma of stage T3N0M0 (Masaoka stage III). First line chemotherapy was indicated according to the CAP protocol in 4 cycles. Since there was a great regression in the size of the tumor after the first line chemotherapy, and the patient was of good performance status, radiotherapy was also indicated and the patient received via 3D conformal radiotherapy 60Gy/30fr. The next control CT after

radiotherapy showed complete regression of the tumor, and the patient was of good performance status.

CONCLUSION

Diagnostics and treatment of thymomas should be carried out in with a multidisciplinary team which consists of a surgeon, a medical oncologist and a radiation oncologist where every patient should be assed individually.

KEYWORDS

Thymoma, surgery, chemotherapy, radiotherapy, malignant tumor

P16 ENDOSKOPSKI ASPEKTI SINDROMA SREDNJEG REŽNJA

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UVOD

Sindrom srednjeg režnja je termin koji se u pulmologiji koristi za označavanje brojnih patoloških stanja praćenih atelektazom i smanjenjem volumena srednjeg režnja. Prema različitim autorima, sindrom srednjeg režnja se javlja kod 0,33-6% plućnih bolesnika, a kod muškaraca se nalazi oko dva puta češće. Sindrom srednjeg režnja je preliminarna klinička i radiološka dijagnoza koja zahteva dalje razjašnjenje uzroka ovog patološkog procesa. Predlaže se da se iz ovog koncepta isključe slučajevi atelektaze uzrokovane tumorskom opstrukcijom bronha. U praksi, do diferenciranja dijagnoze i utvrđivanja etiologije, u ovaj termin se može skrivati i uključujući bronhogeni karcinom. Različite varijante sindroma srednjeg režnja treba razlikovati od centralnog karcinoma pluća, tuberkuloze i interlobarnog pleuritisa. Rjeđi diferencijalno dijagnosticki uzroci mogu biti perikardijalna cista i abdomenomedijastinalni lipom. Izolacija ovog sindroma je posljedica relativno visoke incidencije oštećenja ovog područja desnog pluća, što je povezano sa anatomskim karakteristikama. U poredjenju sa drugim lobarnim bronhima, srednji lobarni bronh ima najuži promjer i najveću dužinu, osim toga, kada se odvoji od intermediernog bronha formira akutni ugao od oko 30°. U neposrednoj blizini bronha srednjeg režnja nalazi se veliki broj bronhopulmonalnih limfnih čvorova čija hiperplazija vrsi spoljasnu kompresiju zida bronha. Obzirom na ove karakteristike lakse se desava hipoventiliranost srednjeg reznja. Cilj rada je analiza, procena i uporedjenje bronhoskopskih nalaza u slucajevima gde su indikacije za endoskopski pregled bile radiografski uocene promene (na posteroanteriornu i grafiju u lateralnom polozaju) u predeo anatomske projekcije srednjeg reznja (sifra po MKB R91 – „nenormalni nalazi kod dijagnostickog snimanja pluca" – Pulmones ad diagnosticam abnormales), bez obzira na ispoljavanju klinickih simptoma.

PRIKAZ SLUČAJA

Slucaj 1. AM, zena 48 godina starosti, sa anamnezom za nespecificne tegobe koje su se manifestovale nekoliko dana pre javljanja na pregled: dominira laksi bol u grudima i retki suvi kasalj. Nije dobiven podatak za povisenu temperaturu ili groznicu. Nepusac, bez komorbiditeta, negativna licna i porodicna anamneza. Standardne laboratorijske analize i tumorski markeri su bili u granicama referentnih vrednosti. Rentgengrafija je pokazala nalaz infiltracije u projekciji srednjeg reznja. CT toraksa je prikazao konglomerat limfoglandula u medijastinumu, konsolidacionu zonu u desnom hilusu sa anterobazalnom propagacijom, te pozitivni vazdusni bronhogram. Bronhoskopski pregled je utvrdio laku stenozu usca srednjeg reznja, submukoznu i mukoznu infiltraciju sa stenozom lumena, te potpunu neprohodnost lumena distalno

od infiltrirajuce mase sa hiperemicnom sluzokozom. Takodje je primecen difuzni edem sluzokoze (morfoloski podtip edematozni, hyperemic, fibrostenic). Histoloski nalaz je potvrdio granulomatoznu inflamaciju sa mnostvom epitelovidnih granuloma, deo sa prisutnom centralnom nekrozom, oko kojih su se videli nakupine limfocita. Definitivna histoloska dijagnoza je bila Inflammatio chronica granulomatosa, cime je bila potvrdjena klinicka dijagnoza endobronhijalne tuberkuloze. Mikrobioloski nalaz bronhoaspirata i sputuma nije povrdio psisustvo acidorezistentnih bacila (u direktnom preparatu i sa imunofluorescentnom tehnikom, kultrure po Lovenstein-Jensen-u i Bactec-u su ostale negativne). Dobijen je pozitivan nalaz molekularnog testa (GeneXpert). Antituberkulotska terapija je sprovodjena 9-to mesecnim rezimom (zbog produljene klinicke simptomatologije i prolongiranog radioloskog nalaza infiltrativnih promena, sto je upucivalo na produzenu aktivnost bolesti i usporene tkivne regeneracije, usled toga je bio sproveden i vremeni oralni steroidni rezim nakon cega se pratila srednje izrazena radioloska rezolucija (u daljem toku ce se pratiti stvaranje rezidua i sekudarnih bronhiektaticnih promena u srednjem reznju, sto ce se najverovatnije i klinicki manifestovati u sklopu „sindroma rednjeg reznja“). Terapijski rezim je zavrsen, pacijentkinja je se vratila na posao, fizicki je u solidnu kondiciju, ali se zapazaju povremeni simptomi u vidu slabo produktivnog kaslja, stezanja u grudima, povremenim osecajem grudnog diskomforta i opste nelagodnosti, te cescih „prehlada“, dok su laboratoriski parametri i plucna funkcija u normalnim granicima. Kontrolna bronhoskopija je pokazala difuzni edem sluzkoze lika submukozne infiltracije osobito u lingularnom bronhu (u biopsiji su nadjene fibrokolagene i hijaline promene, odgovor patologa je “fibrosis“). Usce srednjeg reznja je prohodno, distalno se prati stenoza lumena bronha te se ne mogu vizuelizirati segmentalna usca (komparativno sa nalazom pre UVODjenja terapije, prati se redukcija promena usca srednjeg reznja koje je sada prohodno, dok su promene u linguli skoro identicnog izgleda). Sveukupni izlged upucuje na posttuberkulozne sekvele (u daljem toku I visegodisnjeg pracenja bice procenjeno u pogledu definitivnih rezidua kao i ispoljavanju simptoma u sklopu „sindroma srednjeg reznja“). Slucaj 2. JV, u dobi od 72 godine, upucen pulmologu zbog opstih simptoma: osecaj malaksalosti, gubitak apetita i gubitak na telesnu tezinu, produzeni kasalj sa iskasljavanjem gustog sekreta, te bolova po celom telu osobito u ledjima (slabinskom i krstnom predelu kicme), bol u grudima sa desne strane. Tegobe traju vec 6 meseci unazad. Prethodno zbog simptoma parapareze postavljena je sumnja na paraneoplasticni sindrom. Pacijent je bio hospitalizavan na Neuroloskoj klinici gde je uradjen KT pregled LS kisme i vidjene su osteoliticke promene sa smanjenjem promera pojedinih prsljenskih tela. Iz licne anamneze: visegodisnji pusac. Auskultatorni nalaz na plucima pokazuje oslabljeni disajni sum s predne strane desnog hemitoraksa, nema uvecanih limfoglandula. Laboratorijske analize nisu karakteristicne. Radiografija je pokazala solidnu homogenu promenu trouglastog izduzenog oblika u projekciji srednjeg reznja (lobarna atelektaza). Bronhoskopski nalaz je bio tipican – iz usca srednjeg reznja prominira tumorska masa glatke sivkastobelicaste povrsine koja obturira u potpunosti usce bronha sa involviranjem interlobarne karine koja se ne moze raspoznati u tumorsku infiltraciju – endoskopska dijagnoza je bila: Infiltratio et obturatio bronchi lobi medii, Infiltratio carinae interlobaris. Patohistoloski nalaz iz biopsije je pokazao

sitnoceljski karcinom (histoloska i imunohistohemijska diferencijacija podtipa nije bila uradjena). U staging-u su utvrdjene metastaze u jetri i lumbalnih prsljena. Zbod opste loseg stanja (Karnofsky 50) kod pacijenta nije bio sproveden onkoloski tretman.

ZAKLJUČAK

Prikazani slucaji su nedvosmisleni u dijagnostickom pogledu. Algoritam ispitivanja kod radioloski uocenih promena u projekciji srednjeg reznja treba bezuslovno da ukljuci i endoskopski pregled. Detaljan bronhoskopski pregled je neizbezan kao jednostavan, pouzdan i pecizan dijagnosticki postupak. U prikazanih slucaja endoskopski nalaz je korelisao sa radioloskim i CT nalazom, sto je takodje pomoglo postavljanju dijagnoze, a i sam ishod lecenja je nadopunio dijagnozu.

KLJUČNE REČI

Srednji režanj, sindroma lobi medii, bronhoskopija, endobronhijalna tubekuloza

P16 ENDOSCOPIC ASPECTS OF MIDDLE LOBE SYNDROME

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INTRODUCTION

Middle lobe syndrome is a term used in pulmonology to denote a number of pathological conditions accompanied by atelectasis and a decrease in the volume of the middle lobe. According to different authors, middle lobe syndrome occurs in 0.33-6% of lung patients, and in men it is found about twice as often. Middle lobe syndrome is a preliminary clinical and radiological diagnosis that requires further clarification of the cause of this pathological process. It is suggested to exclude cases of atelectasis caused by tumoral obstruction of the bronchus from this concept. In practice, until the diagnosis is differentiated and the etiology determined, this term can be hidden and include bronchogenic carcinoma. Different variants of middle lobe syndrome should be distinguished from central lung cancer, tuberculosis and interlobar pleurisy. Rarer differential diagnostic causes can be pericardial cyst and abdominal mediastinal lipoma. The isolation of this syndrome is a consequence of the relatively high incidence of damage to this area of the right lung, which is related to anatomical characteristics. In comparison with other lobar bronchi, the middle lobar bronchus has the narrowest diameter and the longest length, moreover, when it separates from the intermediate bronchus it forms an acute angle of about 30°. In the immediate vicinity of the bronchus of the middle lobe, there is a large number of bronchopulmonary lymph nodes whose hyperplasia causes external compression of the bronchial wall. Due to these characteristics, hypoventilation of the middle section occurs more easily. The aim of the work is the analysis, assessment and comparison of bronchoscopic findings in cases where the indications for endoscopic examination were radiographically observed changes (on posteroanterior and lateral view) in the area of the anatomical projection of the middle section (code according to ICD R91 - "abnormal findings in diagnostic imaging of the lungs " - Pulmones ad diagnosticam abnormales), regardless of the manifestation of clinical symptoms.

CASE REPORT

Case 1. AM, a 48-year-old woman, with a history of non-specific complaints that manifested themselves a few days before appearing for an examination: light chest pain and a rare dry cough predominate. No data was obtained for elevated temperature or fever. Non-smoker, no comorbidities, negative personal and family history. Standard laboratory analyzes and tumor markers were within reference values. X-ray showed the finding of infiltration in the mid-section projection. Chest CT showed a conglomeration of lymphoglands in the mediastinum, a consolidation zone in the right hilus with anterobasal propagation, and a positive air bronchogram. Bronchoscopic examination confirmed mild stenosis of the mouth of the median incision, submucosal and mucosal infiltration with stenosis of the lumen, and complete impermeability of the lumen

distal to the infiltrating mass with hyperemic mucous membrane. Diffuse edema of the mucosa (morphological subtype edematous, hyperemic, fibrosthenic) was also observed. Histological findings confirmed granulomatous inflammation with many epithelioid granulomas, some with central necrosis, around which accumulations of lymphocytes were seen. The definitive histological diagnosis was Inflammatio chronica granulomatosa, which confirmed the clinical diagnosis of endobronchial tuberculosis. The microbiological findings of bronchoaspirate and sputum did not reveal the presence of acid-resistant bacilli (in the direct preparation and with the immunofluorescence technique, cultures according to Lovenstein-Jensen and Bactec remained negative). A positive molecular test result (GeneXpert) was obtained. Antituberculosis therapy was carried out with a 9-month regime (due to prolonged clinical symptoms and prolonged radiological findings of infiltrative changes, which pointed to prolonged disease activity and slowed tissue regeneration, as a result, a temporary oral steroid regime was also carried out, after which moderate radiological resolution (in the future, the formation of residual and secondary bronchiectatic changes in the middle section will be monitored, which will most likely manifest clinically as part of the "second section syndrome"). condition, but there are occasional symptoms in the form of a poorly productive cough, chest tightness, occasional feeling of chest discomfort and general discomfort, and frequent "colds", while laboratory parameters and lung function are within normal limits submucosal infiltration, especially in the lingular bronchus (in the biopsy, fibrocollagenous and hyaline changes were found, the pathologist's answer was "fibrosis"). The mouth of the median incision is passable, stenosis of the bronchial lumen is observed distally, and segmental orifices cannot be visualized (compared to the findings before the INTRODUCTION of therapy, the reduction of changes in the orifice of the median incision is monitored, which is now passable, while the changes in the lingula are almost identical in appearance). The overall appearance points to post-tuberculosis sequelae (in the further course of the multi-year follow-up, it will be evaluated in terms of definite residues as well as the manifestation of symptoms as part of the "middle cut syndrome"). Case 2. JV, aged 72, was referred to a pulmonologist due to general symptoms: a feeling of weakness, loss of appetite and weight loss, prolonged cough with expectoration of thick secretions, and pain all over the body, especially in the back (lumbar and sacral region of the spine). , pain in the chest on the right side. The problems have been going on for 6 months. Paraneoplastic syndrome was previously suspected due to symptoms of paraparesis. The patient was hospitalized at the Neurological Clinic, where a CT scan of the LS region was performed and osteolytic changes were seen with a decrease in the diameter of individual vertebral bodies. From personal history: long-term smoker. Auscultatory findings on the lungs show a weakened respiratory sound on the front side of the right hemithorax, there are no enlarged lymph glands. Laboratory analyzes are not characteristic. Radiography showed a solid homogeneous change of elongated triangular shape in the mid-section projection (lobar atelectasis). The bronchoscopic finding was typical – a tumor mass with a smooth grayish-white surface protrudes from the mouth of the median incision, which completely obturates the mouth of the bronchus with the involvement of the interlobar carina, which cannot be recognized as tumor infiltration – the endoscopic

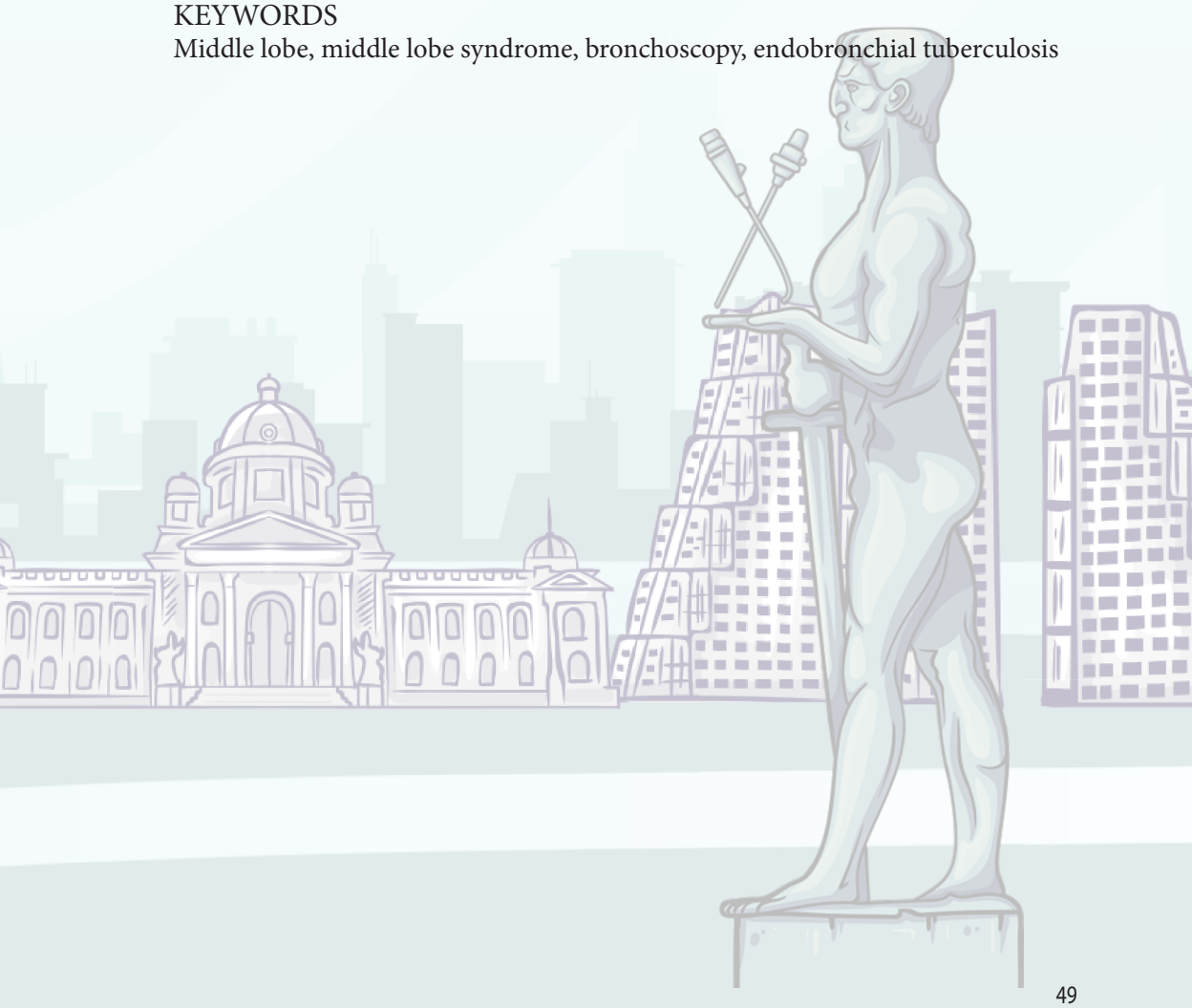
diagnosis was: Infiltratio et obturatio bronchi lobi medii, Infiltratio carinae interlobaris . Pathohistological findings from the biopsy showed small cell carcinoma (histological and immunohistochemical differentiation of the subtype was not performed). During the staging, metastases in the liver and lumbar vertebrae were found. Due to general poor condition (Karnofsky 50), the patient was not treated oncologically.

CONCLUSION

The presented cases are unequivocal in terms of diagnosis. The examination algorithm for radiologically observed changes in the mid-section projection should unconditionally include an endoscopic examination. A detailed bronchoscopic examination is inevitable as a simple, reliable and accurate diagnostic procedure. In the presented cases, the endoscopic finding correlated with the radiological and CT findings, which also helped to establish the diagnosis, and the outcome of the treatment itself complemented the diagnosis.

KEYWORDS

Middle lobe, middle lobe syndrome, bronchoscopy, endobronchial tuberculosis



P17 ULOGA MEDICNSKE SESTRE PRILIKOM IZVOĐENJA TRANSTORAKALNE BIOPSIJE

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UVOD

Transtorakalna biopsija je invazivna metoda gde se sa specijalnom iglom sa koso izrezanim vrhom aspirira delić tkiva za histolosku analizu. Izvodi se zbog evaluacije perifernih plućnih nodusa ili masa, promena u hilusu, medijastinumu i pleure, pod KT, RTG ili EHO kontrolom.

PRIKAZ SLUČAJA

Prikazujemo slucaj pacijentkinje K.S, 69 godina, koja je bila upućena na Klinici za pulmologiju i alergologiju za dijagnostiku periferne senke, detektirane na KT pluća. Senka je vizuelizirana ultrazvučnom sondom; sukcesivno je izvršena transtorakalna kor biopsija pod ultrazvučnom kontrolom. Dokazan je planocelularni karcinom pluća i bolesnica je upućena za onkološki tretman. Uloga medicinske sestre u ovoj intervenciji je veoma vazna, u pripremi pacijenta, materijala i u asistiranju tokom intervencije. Za izvođenje transtorakalne biopsije potrebne su dve sestre, jedna koja prati vitalne parametre bolesnika prije i tokom postupka i pruza potporu bolesniku, a druga [sterilna] medicinska sestra koja asistira doktoru. Nakon intervencije, sestra je odgovorna za transport materijala za histopatološko analiziranje I dokumentiranje intervencije. Medicinska sestra smesti bolesnika u bolnicki krevet 24 sata i meri vitalne znake, kasalj, eventualnu pojavu hemoptizija, proverava mesto uboda i alarmira doktoru ukoliko primeti promenu kod pacijenta.

ZAKLJUČAK

Uspešno izvođenje transtorakalne kor biopsijei minimizranje komplikacija zavisi od tesne suradnje celog tima, a narochito od veštine i uigranosti medicinske sestre I pulmologa koji izvodi inervenciju.

KLJUČNE REČI

Medicinska sestra, transtorakalna kor biopsija, plucni infiltrati

P17 ROLE OF PULMOLONOGY NURSE IN TRANS THORACIC CORE BIOPSY

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INTRODUCTION

Transthoracic biopsy represents an invasive method intended for sampling/ aspiration of part of lung tissue with a specially cut needle for histopathological analysis. It is indicated for evaluation of peripheral lung nodules or masses, hillar changes, mediastinal and pleural infiltrates, under CT, X-ray or ultrasound control.

CASE REPORT

We present the case of a female patient K.S., 69 years old, who was referred to the Clinic for Pulmonology and Allergology for diagnosis of a peripheral mass, detected on lung CT. The tumor was visualized with an ultrasound probe; a transthoracic core biopsy was successively performed under ultrasound control. Squamous cell carcinoma of the lung was diagnosed and the patient was referred for oncological treatment. The role of the nurse in this intervention is very important, in preparing the patient and the materials and in assisting during the intervention. To perform a transthoracic biopsy, two nurses are needed, one who monitors the patient's vital parameters before and during the procedure and provides support to the patient, and the other [sterile] nurse who assists the doctor. After the intervention, the nurse is responsible for transporting the acquired material for histopathological analysis and documenting the intervention. The nurse rorganizes hospitalization and monitoring of th epatient for 24 hours and measures vital signs, cough, possible occurrence of hemoptysis, checks the punction site and alerts the doctor if she notices signs of any complications.

CONCLUSION

Successful performance of a transthoracic core biopsy and minimization of complications depends on the close cooperation of the entire team, and especially on the skill and coordination of the nurse and the pulmonologist performing the intervention.

KEYWORDS
Medical nurse, transthoracic core biopsy, lung infiltrates

P18 HEMOPTIZA SA UGLA BRONHOLOGA U OKVIRU OPŠTE BOLNICE

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UVOD

Hemoptiza je iskašljavanje krvi iz disnog sistema. To je zabrinjavajuci simptom i ujedno klinički znak koji najcešce odvodi pacijenta lekaru. Masivna (obilna) hemoptiza je iskašljavanje preko 600 ml krvi (otprilike količina koja odgovara jednoj posudi koja ima oblik bubrega, tzv bubrežnjak) za 24 h. Iskašljaj protkan krvlju je prilicno čest i vecinom nije ozbiljan nalaz. Iskasljaj sa primjesama krvi moze biti posledica infekcije ali i ozbiljnijeg procesa, tako da svakako zahteva dijagnostičku obradu kako bi se otkrilo sta stoji u podlozi njegove pojave. Uzroci hemoptizija u 20% su tumori, posebno karcinom pluca. U pusača starijih od 40 godina sa hemoptizom, lekari traze rak pluca čak i kada je iskasljalj samo protkan krvlju. Plucni infarkt moze takodje uzrokovati hemoptizu. Endoskopski pregled je osnovni i doktrinarni postupak kod pacijenta koji prijavi hemoptizu u pneumoftiziolosku ambulantu bolnice opsteg tipa. Embolizacija bronhalnih arterija je postala glavna metoda koja uspjesno zaustavlja obilne hemoptize u do 90% slucajeva. Hitna hirurska intervencija je indicirana kod obilnih hemoptiza koje nije moguce zaustaviti rigidnom bronhoskopijom niti embolizacijom i opste pretstavlja zadnju mogucnost. Lečenje oskudnije hemoptize je usmereno na uzrok. Krvarenje usled mitralne stenoze ili srčane dekompenzacije drugog uzroka, obicno reagira na specifičnu kardiolosku terapiju. Krvarenje zbog plucne embolije retko je obilno (masivno) i gotovo uvek se spontano zaustavlja. Ako dodje do recidiva embolije a krvarenje i dalje traje, antikoagulantna terapija moze biti kontraindicirana, a terapijski izbor je postavljanje filtra u donju suplju venu. Buduci da je krvarenje iz bronhiektazija obično posljedica infekcije, bitno je sprovesti odgovarajucu antibiotsku terapiju i polozajnu drenazu.

CILJ

Cilj rada je pregled bronhoskopskih nalaza kod pacijenata koji su dali anamnesticki podatak o iskasljavanju krvavog sekreta ili ciste krvi (bez obzira na kolicinu), a koji su imali urednu radiografiju (na radiografiji grudnog kosa nisu bile uocene patoloske promene plucnih polja, medijastinuma, srcane siluete ili toraksnog zida).

MATERIJALI I METODE

Izvrsena je retrospektivna analiza 3140 bronhoskopskih izvestaja sa protokola pulmoloske ambulante Gradske opste bolnice "8-mi septemvri" i Dispanzera za plucne bolesti i tuberkulozu bivse Vojne bolnice u Skoplju. Razmatran je period od 40 godina (1983-2023). U obradu su uzeti izvestaji gde je indikacija za endoskopski pregled bila dijagnoza hemoptiza – sifra po ICD-u R04.2- krvav ispljuvak (Haemoptysis).

Iskljucivo retko smo nalazili druge sifre sa indikacijom za bronhoskoski pregled, kao: R04 krvarenje iz disjnih puteva (Haemorrhagia tractuum respiratoriorum), R04.1 krvarenje iz zdrela (Haemorrhagia pharyngis), R04.8 krvarenje iz drugih delova disajnih puteva (Haemorrhagia partium tractuum respiratoriorum aliarum) i R04.9 krvarenje iz disajnih puteva, neoznaceno (Haemorrhagia partium tractuum respiratoriorum non specificata). Razmotreni su samo slucajevi koji su imali uredan radioloski nalaz (radiografija grudnog kosa u okviru fizioloskog nalaza za odredjenu dobrnu uzrast, bez uocenih patoloskih parenhimskih ili medijastinalnih promena u smislu konsolidacije/ infiltracije, slobodnih frenikokostalnih sinusa, srcana silueta sa sacuvanim kardiotoraksnim indeksom i bez promena na zidu grudnog kosa). Uzrast se kretala od 18 do 88 godina. Endoskopski pregled je kod svih bio uradjen fleksifilnim instrumentom (marke Olympus i Stortz) u lokalnu anesteziju. Pregled je izvodjen u skladu sa standardima i normativima. Premedikaciju apaurinom ili atropinom smo retko primenili. Intubacija je u najvecem broju bila transnazalna (u manjem broju oralna, a iskljucivo retko preko trahealnog tubusa).

REZULTATI

Endoskopske nalaze smo razvrstili i podelili u sledece grupe – Difuzni krvni podlivi po sluzokozi N 140 (4.5%) – Jednostrana hemoragija (naslage krvi ili ugrusaka po sluzokozi) N 310 (10%) – Minimalni nalaz krvavog sadrzaja (tačkasti krvni podlivi jednostrano ili obostrano) – N 316 (10%) – Krvarenje iz gornjih disajnih puteva (slevanje krvi i krvavog sadrzaja u traheji i bronhije) – N 248 (8%) – Hiperemija, edem, pojačana vulnerabilnost bronhalne sluzokoze (nisu nadjeni tragovi krvi) – N 810 (26%) – Normalan nalaz (nalaz u okviru fizioloskog, otsustvo patoloskog supstrata, nisu vidjeni tragovi krvi – nalaz se uklapa u fizioloski za dobnu uzrast) – N 1306 (41.5%) – Anatomski varijetet bronhalnog stabla (laznopatoloski nalaz – prekobrojna ili nedostatak usca na mestu anatomskog polozaja, atrezije i slepi zavrsetci segmentalnih/ subsegmentalnih grana) – N 8 (0.2%) – Endoskopski nalaz infiltracije bronhalne sluzokoze (nalaz visoko suspektan za maligne promene) - N 2 (0.06%) – kod ova dva pacijenta je uzeta biopsija i histoloski je potvrdjena bronhogena neoplazma (NSCLC). Rezultati ovog ispitivanja su pokazali da je najveci broj pacijenata sa anamnezom o hemoptizijama imao uredan bronhoskopski nalaz. Radilo se o hemoptizi manjeg obima. Uzimajuci u obzir anatomiju i fiziologiju plucnog krvotoka, najveci deo krvi u plucima (oko 95%) cirkulira kroz plucne arterije u kojima je pritisak nizak i zavrsava u plucnu kapilarnu mrezu gde dolazi do izmene gasova. Oko 5% krvi koja dospeva u pluca cirkulira kroz visokopritisačni sistem bronhijalnih arterija koje su ogranci aorte i koje snabdevaju velike bronhe i potporna tkiva (nutritivni krvotok). Kod hemoptiza krv po pravilu potiče iz bronhijalnog krvotoka, osim u slučaju ostecenja plucnih arterija. Dobiveni rezultati upucuju na to da kod hroničnih bronhopulmonalnih stanja česce dolazi do stvaranja anastomoza (komunikacije bronhijalnih-sistemskih i pulmonalnih kapliara) koje krvare usled upale ili mikroozljeda, pri cemu se krv sakupi i iskaslje.

ZAKLJUČAK

Pacijentima sa anamnezom o iskasljavanju krvi ili krvavog sekreta u kojih je radiografski nalaz u okviru fizioloskog, apsolutno indikovati endoskopski pregled. Bronhoskopski pregled kod hemoptize uzeti za doktrinarni stav sa gledista pneumoftiziologa-bronhologa i u okviru opste bolnice, bez obzira na okolnosti ili drugih mogucih uzroka. Radiografski i endoskopski nalaz u okviru fizioloskog za starosnu dob ne isključuje mogucnost intrapulmonalnih uzroka hemoptizija. Sistemsko pulmonalne arterijske komunikacije su najčesti uzrok hemoptizija. Endoskopski nalaz hiperemije i minimalnih krvnih podliva, te vulnerabilnost bronhalne sluzokoze, nije dao dovoljnog objasnjenja o uzroku. Shodno tome, kod recidivirajuce hemoptize su indikovani dalji dijagnostičko interventni postupci kao i prosireni hematoloski paket istrazivanja.

KLJUČNE REČI

Hemoptiza, bronhoskopija, krvav iskasljaj, bronholog

P18 HAEMOPTYSIS FROM THE POINT OF VIEW OF A BRONCHOLOGIST IN THE FRAMEWORK OF A GENERAL HOSPITAL

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INTRODUCTION

Hemoptysis is the coughing up of blood from the respiratory system. It is a worrying symptom and at the same time a clinical sign that most often leads the patient to the doctor. Massive (abundant) hemoptysis is the coughing up of over 600 ml of blood (approximately the amount that corresponds to one kidney-shaped vessel, the so-called kidney) in 24 hours. Coughing up blood is quite common and is usually not a serious finding. Cough with admixtures of blood can be the result of an infection or a more serious process, so it definitely requires diagnostic workup to find out what is behind its appearance. The causes of hemoptysis in 20% are tumors, especially lung cancer. In a smoker over 40 with hemoptysis, doctors look for lung cancer even when the cough is only blood-tinged. Pulmonary infarction can also cause hemoptysis. Endoscopic examination is a basic and doctrinal procedure in a patient who reports hemoptysis to the pneumophthisiology clinic of a general hospital. Bronchial artery embolization has become the main method that successfully stops profuse hemoptysis in up to 90% of cases. Urgent surgical intervention is indicated for profuse hemoptysis that cannot be stopped by rigid bronchoscopy or embolization and generally represents the last possibility. Treatment of scantier hemoptysis is directed at the cause. Bleeding due to mitral stenosis or cardiac decompensation from another cause usually responds to specific cardiological therapy. Bleeding due to pulmonary embolism is rarely profuse (massive) and almost always stops spontaneously. If the embolism recurs and the bleeding continues, anticoagulant therapy may be contraindicated, and the therapeutic choice is the placement of a filter in the inferior saphenous vein. Since bleeding from bronchiectasis is usually a consequence of infection, it is important to carry out appropriate antibiotic therapy and local drainage.

OBJECTIVE

The aim of the work is to review the bronchoscopic findings in patients who gave anamnestic information about coughing up bloody secretions or clear blood (regardless of the amount), and who had a normal radiograph (no pathological changes in the lung fields, mediastinum, cardiac silhouette or in the chest wall were no observed on the chest radiography).

MATERIAL AND METHODS

A retrospective analysis of 3140 bronchoscopic reports from the protocols of the pulmonology clinic of the City General Hospital "8-mi Septemvri" and the Dispensary

for Lung Diseases and Tuberculosis of the former Military Hospital in Skopje was performed. A period of 40 years (1983-2023) was considered. Reports where the indication for endoscopic examination was the diagnosis of hemoptysis – ICD code R04.2 – bloody sputum (Haemoptysis) were taken into consideration. We rarely found other codes with an indication for a bronchoscopic examination, such as: R04 bleeding from the respiratory tract (Haemorrhage tractuum respiratoryorum), R04.1 bleeding from the pharynx (Haemorrhage pharyngis), R04.8 bleeding from other parts of the respiratory tract (Haemorrhage partium tractuum respiratoryorum aliarum) and R04.9 bleeding from the respiratory tract, unspecified (Haemorrhagia partium tractuum respiratoryorum non specificata). Only cases that had normal radiological findings were considered (chest radiograph within physiological findings for a given age, without observed pathological parenchymal or mediastinal changes in terms of consolidation/infiltration, free phrenicocostal sinuses, cardiac silhouette with a preserved cardiothoracic index and no changes in chest wall). The age ranged from 18 to 88 years. Endoscopic examination was performed in all patients with a flexible instrument (Olympus and Stortz brands) under local anesthesia. The review was performed in accordance with standards and norms. Premedication with apaurin or atropine was rarely used. Intubation was mostly transnasal (oral in a smaller number, and only rarely through a tracheal tube).

RESULTS

We classified and divided the endoscopic findings into the following groups – Diffuse hemorrhages on the mucous membrane N 140 (4.5%) – Unilateral hemorrhage (deposits of blood or clots on the mucous membrane) N 310 (10%) – Minimal finding of blood content (punctate bruises on one or both sides) - N 316 (10%) – Bleeding from the upper respiratory tract (pouring of blood and bloody contents in the trachea and bronchi) – N 248 (8%) – Hyperemia, edema, increased vulnerability of the bronchial mucosa (no traces of blood were found) – N 810 (26%) – Normal finding (finding within the physiological range, absence of pathological substrate, no traces of blood were seen – the finding fits into the physiological range for the age group) – N 1306 (41.5%) – Anatomical variety of the bronchial tree (false pathological finding – excessive or lack of mouth at the anatomical location, atresia and dead ends of segmental/subsegmental branches) – N 8 (0.2%) – Endoscopic finding of infiltration of the bronchial mucosa (a finding highly suspicious for malignant changes) – N 2 (0.06%) – biopsies were taken in these two patients and bronchogenic neoplasm (NSCLC was histologically confirmed). The results of this study showed that the largest number of patients with a history of hemoptysis had normal bronchoscopic findings. It was a minor hemoptysis. Taking into account the anatomy and physiology of the pulmonary blood flow, most of the blood in the lungs (about 95%) circulates through the pulmonary arteries where the pressure is low and ends up in the pulmonary capillary network where gas exchange occurs. About 5% of the blood that reaches the lungs circulates through the high-pressure system of the bronchial arteries, which are branches of the aorta and which supply the large bronchi and supporting tissues (nutritional blood flow). In hemoptysis, as a rule, the blood originates from the bronchial bloodstream, except in the case of damage to the

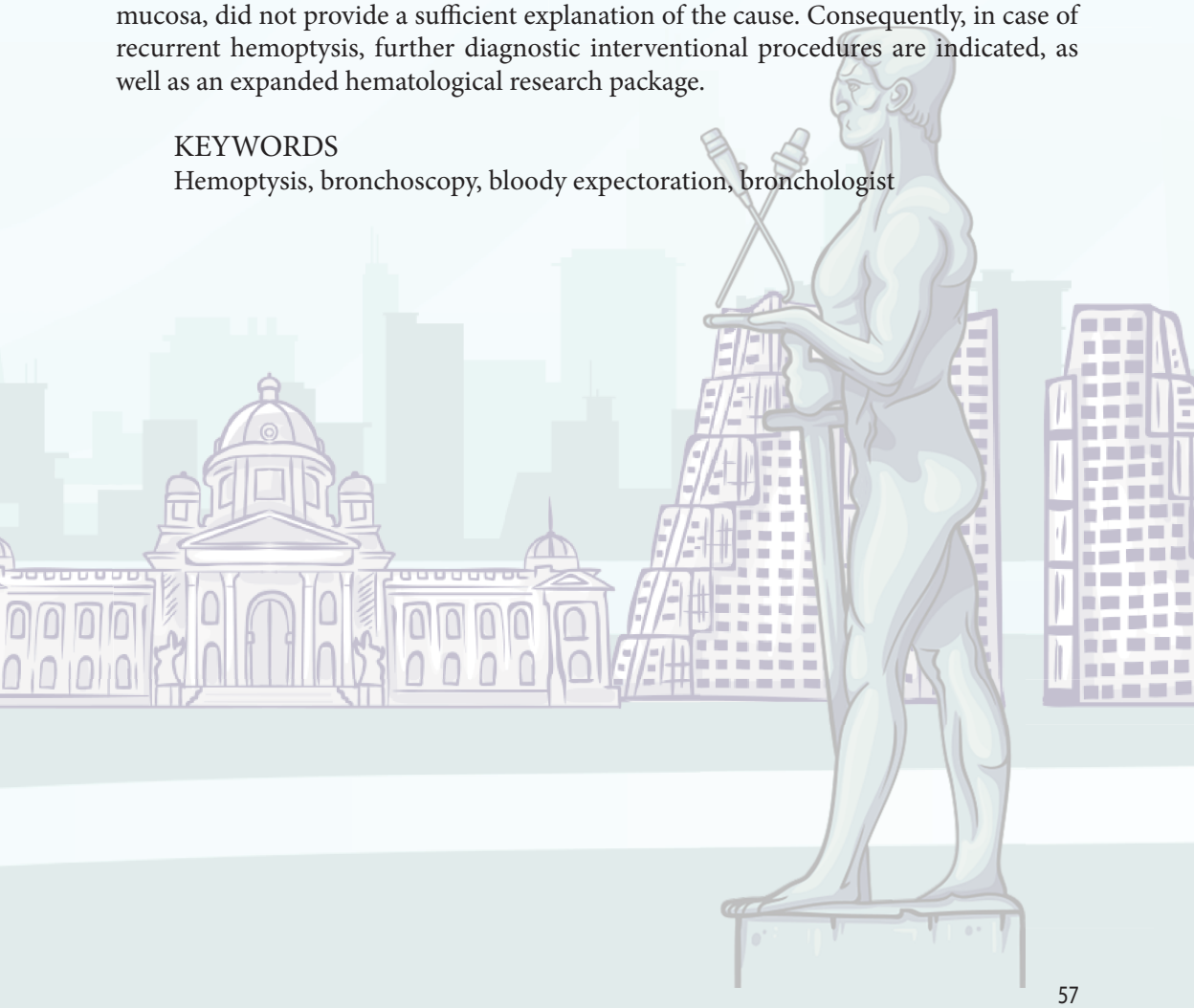
pulmonary arteries. The obtained results indicate that in chronic bronchopulmonary conditions, the creation of anastomoses (communication of bronchial-systemic and pulmonary capillaries) that bleed due to inflammation or microinjury, during which the blood collects and drains out, often occurs.

CONCLUSION

patients with a history of coughing up blood or bloody secretions, in whom the radiographic findings are within the physiological range, absolutely indicate endoscopic examination. Bronchoscopic examination in hemoptysis should be taken as a doctrinal position from the point of view of a pneumophthisiologist-bronchologist and within a general hospital, regardless of the circumstances or other possible causes. Radiographic and endoscopic findings within the physiological framework for age do not exclude the possibility of intrapulmonary causes of hemoptysis. Systemic pulmonary arterial communication is the most common cause of hemoptysis. The endoscopic finding of hyperemia and minimal blood vessels, as well as the vulnerability of the bronchial mucosa, did not provide a sufficient explanation of the cause. Consequently, in case of recurrent hemoptysis, further diagnostic interventional procedures are indicated, as well as an expanded hematological research package.

KEYWORDS

Hemoptysis, bronchoscopy, bloody expectoration, bronchologist



P19 DIJAGNOSTIČKA TAČNOST I BEZBEDNOST CT VOĐENE PERKUTANE BIOPSIJE PLUĆNE PERIFERNE LEZIJE

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UVOD

Perkutana biopsija (PCNB) vođena CT-om je dobro uspostavljena metoda za histološku dijagnozu plućnih lezija. Postoji obilna literatura o dijagnostičkom prinosu i komplikacijama povezanim sa CT – vođenim PCNB. Mnoge studije su istraživale faktore rizika koji utiču na pneumotoraks. Nasuprot tome, postoji ograničen broj izveštaja koji detaljno opisuju tehnike za smanjenje incidence pneumotoraksa ili drugih komplikacija.

CILJ

Ova studija je imala za cilj da proceni dijagnostičku tačnost i bezbednost ove procedure.

MATERIJALI I METODE

Ova studija je obuhvatila 50 pacijenata za koje se sumnja da imaju rak pluća, lečenih u Opštoj bolnici 8. septembra. PCNB vođen CT-om je izveden korišćenjem koaksijalne igle 20 kalibra kod svih pacijenata sa perifernom lezijom pluća kod kojih transbronhijalni pregled nije uspeo da postavi dijagnozu. Nakon biopsije, pacijenti su posmatrani na odeljenju i pozicionirani sa ubodnom stranom nadole. CT snimci neposredno nakon procedure su dobijeni u odabranim slučajevima prema želji operatera. U skladu sa protokolom, radiografija grudnog koša je urađena 4 časa nakon biopsije da bi se isključile komplikacije kao što su pneumotoraks i krvarenje. U slučajevima koji pokazuju razvoj pneumotoraksa, primenjivan je konzervativni tretman uz dodatak kiseonika i praćenje vitalnih znakova. Kod pacijenata koji su pokazivali znake respiratornog distresa ili veliku količinu pneumotoraksa, umetnut je dren. Pacijenti koji nisu imali komplikacije ili su imali minimalan pneumotoraks su otpušteni sledećeg dana. Promenljive koje se odnose na pacijenta kao što su starost, pol, istorija pušenja (nikad pušač, bivši pušač ili sadašnji pušač) i rezultati testa plućne funkcije (prisilni vitalni kapacitet [FVC] su zabeleženi. Informacije u vezi sa lezijom uključivale su lokaciju (gornji, srednji i/ili donji režanj), veličina (prečnik duge ose na aksijalnim CT snimcima) i gustina čvorova (čvrsta ili subsolidna), dodatno je procenjeno prisustvo emfizema.

REZULTATI

Utvrđena je dijagnostička tačnost, osetljivost, specifičnost i procenat nedijagnostičkih rezultata za PCNB u poređenju sa konačnom dijagnozom. Pored toga,

analizirani su faktori rizika za nedijagnostičke rezultate i pneumotoraks. Za centralni rak pluća i endobronhijalne lezije, biopsija pod fleksibilnom bronhoskopijom je imala osetljivost od 86% za dijagnostikovanje raka pluća. Međutim, dijagnostički prinos bronhoskopije za periferne lezije bio je manji, sa osetljivošću od 30%. S druge strane, biopsija vođena CT je veoma osetljiva za dijagnostikovanje perifernog karcinoma pluća. Ukupna dijagnostička tačnost, osetljivost i specifičnost PCNB-a iznosile su 86,2%, 84,5%, odnosno 88,2%. Procenat nedijagnostičkih rezultata bio je 16,0% (8/50). Dva ili manje uzorkovanja biopsije su bili faktor rizika za nedijagnostičke rezultate ($p = 0,003$). Ukupna stopa komplikacija bila je 30% (15/50), a pneumotoraks se razvio kod 10 pacijenata (20%), 5 pacijenata (10%) je imalo manju prolaznu hemoptizu. Drenaža je urađena kod 5 pacijenata (10%), a kod 5 pacijenata (10%) pneumotoraks je spontano porastao. Dugačak transpulmonalni put igle bio je faktor rizika za razvoj pneumotoraksa ($p = 0,006$). Emfizem je bio prisutan kod 14 pacijenata, srednji FEV1% pacijenata bio je 68%, srednji FVC 81%, PaO2 9,1kPa, PaCO2 4,7kPa.

ZAKLJUČAK

PCNB vođen CT pomoću koaksijalne igle je efikasan metod sa razumnom preciznošću i prihvatljivom stopom komplikacija za dijagnozu raka pluća. Može se razmotriti CT vođena biopsija pluća, posebno za lezije pluća koje su postigle dijagnostički neuspeh transbronhijalnim pregledom, koje se nalaze u perifernim oblastima ili imaju nodule od brušenog stakla (GGN).

KLJUČNE REČI

Rak pluća, CT vođena perkutana biopsija pluća, periferna lezija pluća, bronhoskopija

P19 DIAGNOSTIC ACCURACY AND SAFETY OF CT-GUIDED PERCUTANEOUS LUNG BIOPSY FOR PERIPHERAL LESIONS

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INTRODUCTION

CT-guided percutaneous core needle biopsy (PCNB) is a well-established method for the histological diagnosis of pulmonary lesions. There is abundant literature regarding the diagnostic yield of and complications associated with CT – guided PCNB. Many studies have investigated the risk factors influencing pneumothorax. Conversely, there are a limited number of reports detailing techniques for reducing the incidence of pneumothorax or other complications.

OBJECTIVE

This study aimed to assess the diagnostic accuracy and safety of this procedure.

MATERIAL AND METHODS

This study included 50 patients suspected to have lung cancer, treated in General Hospital 8th September. CT-guided PCNB was performed using a 20-gauge coaxial cutting needle in all patients with peripheral lung lesion where transbronchial examination failed in diagnosis. After the biopsy, the patients were observed in the ward and positioned with the puncture side down. Immediate post-procedure CT images were obtained in selected cases according to the operator's preference. In accordance with the protocol, chest radiography was performed 4 h after the biopsy to rule out complications such as pneumothorax and hemorrhage. In cases showing pneumothorax development, conservative treatment was administered with supplemental oxygen and monitoring of vital signs. In patients who showed signs of respiratory distress or a large amount of pneumothorax, a chest tube was inserted. Patients who did not have complications or had minimal pneumothorax were discharged the following day. Patient-related variables such as age, sex, smoking history (never smoker, ex-smoker, or current smoker), and results of the pulmonary function test (forced vital capacity [FVC] were recorded. The lesion-related information included the location (upper, middle, and/or lower lobe), size (long-axis diameter on axial CT images) and nodule density (solid or subsolid). In addition, the presence of emphysema was evaluated.

RESULTS

The diagnostic accuracy, sensitivity, specificity, and percentage of nondiagnostic results for PCNB were determined in comparison with the final diagnosis. Additionally, the risk factors for nondiagnostic results and pneumothorax were analyzed. For central lung cancer and endobronchial lesions, biopsy under flexible bronchoscopy

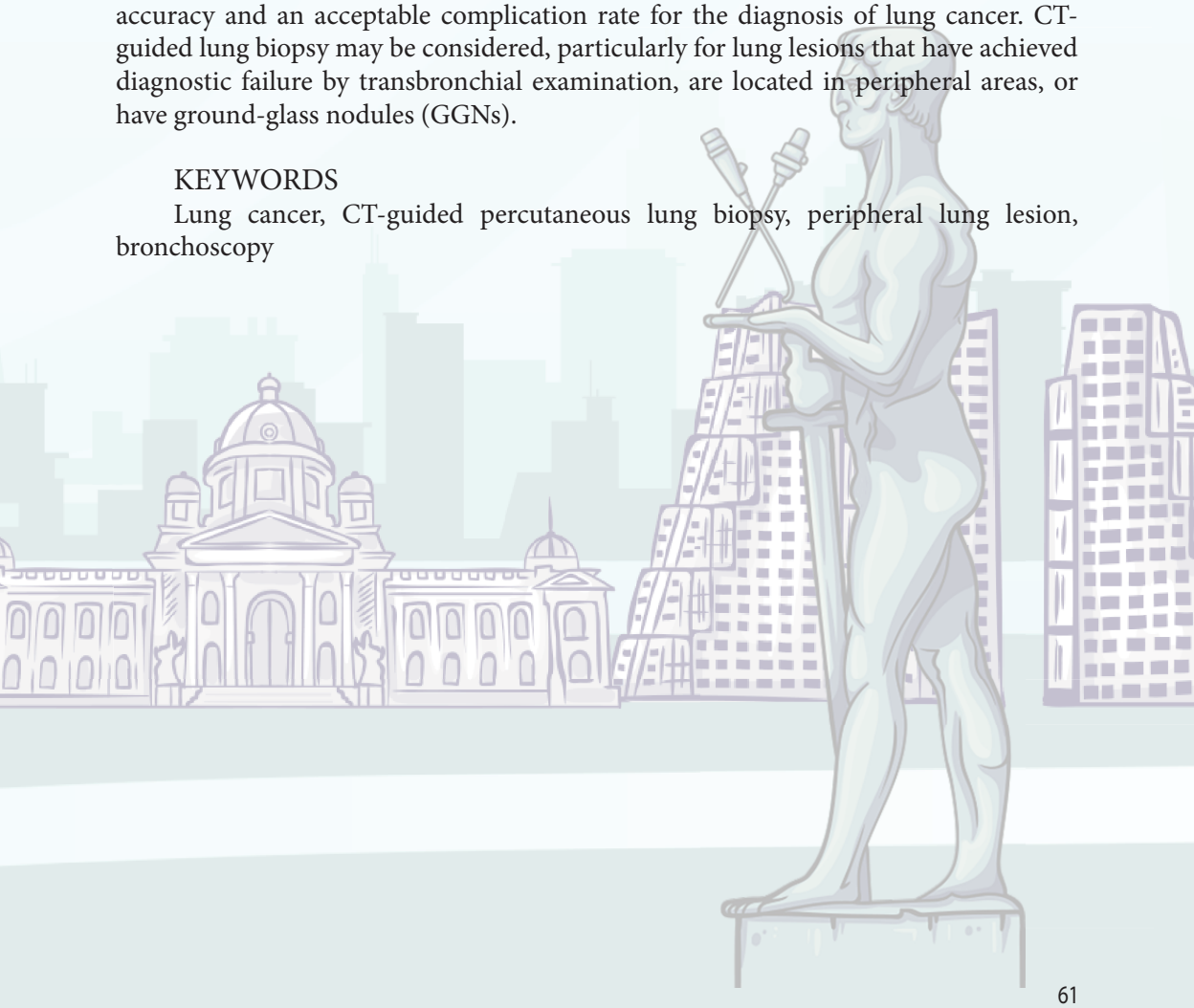
had a sensitivity of 86% for diagnosing lung cancer. However, the diagnostic yield of bronchoscopy for peripheral lesions was lower, with a sensitivity of 30%. On the other hand, CT-guided biopsy is highly sensitive for diagnosing peripheral lung cancer. The overall diagnostic accuracy, sensitivity, and specificity of PCNB were 86.2%, 84.5%, and 88.2%, respectively. The percentage of nondiagnostic results was 16.0% (8/50). Two or less biopsy sampling was a risk factor for nondiagnostic results ($p = 0.003$). The overall complication rate was 30% (15/50), and pneumothorax developed in 10 patients (20%), 5 patients (10%) had minor transient hemoptysis. Drainage was performed in 5 patients (10%), and in 5 patients (10%), pneumothorax resolved spontaneously. A long transpulmonary needle path was a risk factor for the development of pneumothorax ($p = 0.006$). Emphysema was present in 14 patients, mean FEV1% of the patients was 68%, mean FVC 81%, PaO2 9.1kPa, PaCO2 4.7kPa.

CONCLUSION

CT-guided PCNB using a coaxial needle is an effective method with reasonable accuracy and an acceptable complication rate for the diagnosis of lung cancer. CT-guided lung biopsy may be considered, particularly for lung lesions that have achieved diagnostic failure by transbronchial examination, are located in peripheral areas, or have ground-glass nodules (GGNs).

KEYWORDS

Lung cancer, CT-guided percutaneous lung biopsy, peripheral lung lesion, bronchoscopy



P20 KOMPLIKACIJE NAKON TRANSPLANTACIJE PLUĆA

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UVOD

Plućna transplantacija se koristi kao opcija lečenja pacijenata sa terminalnim stadijumom plućnih bolesti. Bolesti kao što su hronična opstruktivna bolest pluća, cistična fibroza, intersticijalna bolest pluća i plućna arterijska hipertenzija u terminalnoj fazi predstavljaju najčešće indikacije za transplantaciju pluća. Nakon složenog procesa transplanatcije osnovni problemi koji mogu nastati nakon transplanatcije se mogu podeliti na lokalne i sistemske komplikacije, a prema vremenu nastanka na akutne i hronične. U lokalne komplikacije spadaju promene koje se dešavaju na mestu grafta 1. Dehiscencija primarne anastomoze i 2. Pneumotoraks, a u sistemske spadaju različite vrste infekcije i odbacivanje grafta. Najčešće komlikacije koje ujedno predstavljaju i indikacije za bronhoskopiju u prvoj nedelji nakon transplatacije pluća su primarna disfunkcija grafta, bakterijska infekcija, akutno odbacivanje i brohijalna dehiscencija, zatim u prvih 6 meseci gljivična i virusna infekcija i brohijalna stenoza, a nakon 6 meseci posttransplantacioni proliferativni poremećaj, hronična disfunkcija alografta pluća i rekurentne bolesti.Dijagnostika komplikacija je složena i zahteva multidisciplinarni pristup više specijalnosti, neophodno je brzo reagovanje, usodtavljanje dijagnoya i brza reakcija-terapija. Metode koje se koriste u dojagnostii su RTG pluća, CT grudnog koša, bronhoskopija sa transhbronhijalnom biopsijom. Najznačajnija dijagnostička procedura je bronhoskopija. Postoje određene kontraverze o samom značaju bronhoskopije pre i nakon transplatacije zbog ograničenog broja studija i izvedenih transplatacija pluća u svetu. Pojedine opservacione studije su pokazale da klinički indikovana bronhoskopija bez rutinskog nadzornog uzorkovanja plućnog alografta ne smanjuje preživljavanje pacijenata sa transplatacijom pluća. Zaključci su da bronhoskopija sa transbrohijalnom biopsijom predstavlja bezbednu dijagnostičku proceduru u toku prve godine nakon transplatacije pluća za otkrivanje infekcija i ranog odbacivanja alografta kod asimptomatskih pacijenata, što može značajno poboljšati dugoročno preživljavanje. Nakon brze kvalitetne dijagnostike u terapijskom planu lečenja akutnih komplikacija nakon transplanatcija pluća primenjuju se moćni lekovi koji u velikom briju slučajeva daju značajne rezultate. U okviru lečenja akutnih komlikacija nakon transplanatcije oluća primenjuju se imunosupresivi, antimikrobni agensi, imunoglobulini, a ne isključuje se i retranplantacija kao procedure. Dobijanje donora, kvalitetnog organa, vrhunska hirurška procedura i dijagnostika su neophodne za uspešnu transplanatciju pluća. Takođe, održavanje transplantiranog pacijenta predstavlja visoko značajan proces sa veklikim brojem učesnika, procedura i terapija koji predstavljaju verifikaciju kvaliteta celog procesa transplanatcije i bez čega nema uspeha.

CILJ

Cilj rada je prikazati kompleksnost procesa transplantacije pluća koja se ogleda kroz direktno složeno sprovođenje procedure. Posebno želimo da istaknemo

dijagnostičke procedure i tretman nakon procesa transplntacije pluća koji predstavlja suštinski nastavak hirurške intervencije i po složenosti i značaju je izuzetno zahtevan i težak proces.

MATERIJALI I METODE

Jedna od najznačajnijih procedura u praćenju posttransplantacionih komplikacija je bronhospokopija.Bronhoskopija kao endoskopska metoda direktnog pregleda traheobrohijalnog stabla, ima značajnu ulogu pre i posle transplatacije pluća. Kao metoda pre transplatacije se koristi u cilju procene kvaliteta plućnog parenhima donora, uz uzimanje bronhoalveolarnog lavata koji se daje na dalje dopunske mikrobiološke i virusološke analize. Ova procedura nije prihvaćena kao standardna operativna procedura ali je itekako značajna u samoj pripremi za transplantaciju, a i u post transplantacionom periodu. Bronhoskopija sa bronhoalveolarnom lavažom i transbrohijalnom biopsijom se nakon transplatacije pluća izvodi radi procene mogućnosti akutnog ćelijskog odbacivanja, ali i komplikacija i infekcija disajnih puteva, naročito citomegalovirusom i limfocitnog bronhiolitisa. Bronhoskopija kao dijagnostička procedura sprovodi se u cilju otklanjanja mogućih ranih i kasnih komplikacija posle transplantacije pluća. Komplikacije se mogu podeliti na lokalne (dehiscencija primarne anastomose i pneumotoraks) i sisitemske komplikacije koje obuhvataju infekcije i odbacivanje grafta. Najčešća komplikacija disajnih puteva u periodu 1-4 nedelje nakon transplantacije je dehiscencija primarne anastomoze koja se karakteriše defektom protoka krvi kroz bronhijalne arterije. (Slika 1) Komplikacije koje se još mogu javiti u prvoj nedelji nakon transplantacije su primarne disfunkcija grafta koja se očekuje u prvih 72h nakon transplantacije, perihilarne ground glass opacifikacije, zadebljanje bronhijalnog zida, predominantno srednji i donji režnjevi pluća, Fenomen tree-in-bud (sekretom ispunjene bronhiole uz zapaljenski proces) (Slika 2). Takođe, u prvoj nedelji još može doći do akutnog odbacivanja grafta koji se javlja kod 50-60% slučajeva u vidu: 1.Akutnog humoralno odbacivanja (hiperakutni tok, minuti-sati, prethodno stvorena Anti HLA At- formirati rečenicu) (Slika3) 2. Akutnog ćelijskog odbacivanja koje se očekuje u periodu od 5 do 10 dana od procedure (velika limfocitna infiltracija) a javlja se kao teško oštećenje tkiva kao posledica aktivnosti citotoksičnih T limfocita.-razraditi rečenicu, i zahteva obaveznu bronhoskopiju sa transbronhijalnom biopsijom. Radiološkim pregledom se mogu uočiti progresivne perihilarne i bazalne opacifikacije, pleuralne efuzije, dok se na skeneru uočavaju ground glass opacifikacije (mlečno staklo) sa septalnim linijama, nodulima, konsolidacijama. Odsustvo ground glass opacifikacija isključuje akutno odbacivanje (Slika 4). U periodu do 6 meseci nakon transplantacije pluća najčešće komplikacije su plućni embolizam (27%) koji se može javiti do 4 meseca nakon transplantacije, gljivične infekcije koje izazivaju gljivice iz roda Aspergillus. Takođe se može javiti i gljivična infekcija koja je kombinovana sa CMV infekcijom (pun naziv virusa-Citomegalovirusi?) i dovodi do sistemskog širenja infekcije u organizmu, zahvata centralni nervni sistem i u velikom procentu (kod 90 %) ishod je letalan. U istom periodu može se očekivati i pojava virusnih infekcija (CMV, EBV, HSV, Influenza) koje se mogu lečiti specifičnom antivirusnom terapijom, ali su svakako neophodne i nedeljne CMV PCR u prva dva meseca nakon transplantacije.

Tuberkuloza, kao još jedna od mogućih komplikacija nakon transplantacije pluća može se očekivati u periodu od 3 meseca nakon operacije ali je dobra prognoza. U ovom periodu kao još jedna od mogućih komplikacija javlja se i bronhijalna stenoza koja se pojavljuje u periodu od 2-9 meseci nakon transplantacije (Slika 5). Nakon transplantacije pluća mogu se očekivati i određene komplikacije u periodu nakon isteka 6 meseci od transplantacije. Jedna od mogućih komplikacija jeste hronično odbacivanje alografta koje se očekuje kod više od 50% pacijenata do 5 godina nakon operacije. PTLD-Posttransplant Lymphoproliferative Disease se javlja u vidu B ćelijskog limfoma u okviru prve godine nakon operacije, dok se CLAD-Chronic lung allograft dysfunction-pad FEV1 >20% može javiti sa dva klinička entiteta: 1.BOS-Bronchiolitis obliterans Sy koji se karakteriše promenom malih disajnih puteva sa opstruktivnom ventilacijom. (Slika 6) 2. RAS-Restriktivni alograft sindrom koji se karakteriše restriktivnim poremećajem ventilacije gde se kroz kliničku sliku uočava kroz Pad FEV 1 do 20%, pad TLC više od 10%. Ovaj sindrom može imati sporu ili brzu progresiju, ali svakako ima lošiju prognozu nego BOS-a (Slika 7). Nakon perioda od godinu dana posle transplantacije pluća mogu se javite rekurentne bolesti kao što su ponovna pojava primarne bolesti, Sarkoidoza (u 35% slučajeva), Lymphagioleiomyomatosis,Langerhanscell histiocytosis,Giant cell pneumonitis, Alveolarna proteinoza, Infekcija mikobakterijom i Karcinom pluća (slika 8 na kojoj su predstavljene sve komplikacije od prve nedelje do posle 6 meseci)-

REZULTATI

Konkluzivnim radom velikog broja stručnjaka uz izuzetan timski rad i multi-disciplinarni pristup postižu se značajni rezultati kako u smanjenju broja komplikacija tako i u lečenju istih.Ovakvim pristupom transplantacija je postala standardni postupak lečenja bolesnika sa uznapredovanom fazom različitih plućnih bolesti.

ZAKLJUČAK

Kvalitetno lečenje komplikacija transplantacije pluća zahteva koordiniranu aktivnost više timova lekara iz oblasti pulmologije uz veliki broj konsultanata i ekspertski pristup rešavanja komplikacija. Činjenica da je transplanatcija pluća postala u velkom broju zdravstvenih sistema standardna procedura govori o napredovanju medicinskih poastupaka i uspešnom lečenju u celom procesu. Promptna evaluacija, postavljanja ispravne dijagnoze i ciljano lečenje je ključ uspešnog transplantacionog procesa koji zahteva jedinstveni multidisciplinarni pristup.

KLJUČNE REČI

Bronhokopija, transplantacija, pluća, komplikacije

P20 COMPLICATION POST LUNG TRANSPLANTATION

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INTRODUCTION

Lung transplantation is used as a treatment option for patients with terminal lung diseases. Diseases such as chronic obstructive pulmonary disease, cystic fibrosis, interstitial lung disease and end-stage pulmonary arterial hypertension are the most common indications for lung transplantation. After the complex process of transplantation, the basic problems that may arise after transplantation can be divided into local and systemic complications, and according to the time of occurrence, into acute and chronic. Local complications include changes that occur at the graft site 1. Dehiscence of the primary anastomosis and 2. Pneumothorax, and systemic complications include various types of infection and graft rejection. The most common complications that are also indications for bronchoscopy in the first week after lung transplantation are primary graft dysfunction, bacterial infection, acute rejection and brochial dehiscence, then in the first 6 months fungal and viral infection and brochial stenosis, and after 6 months post-transplantation proliferative disorder, chronic dysfunction of the lung allograft and recurrent diseases. The diagnosis of complications is complex and requires a multidisciplinary approach of several specialties, it is necessary to react quickly, to make a diagnosis and a quick reaction-therapy. The methods used in diagnostics are X-ray of the lungs, CT of the chest, bronchoscopy with transbronchial biopsy. The most important diagnostic procedure is bronchoscopy. There are certain controversies about the very importance of bronchoscopy before and after transplantation due to the limited number of studies and performed lung transplantations in the world. Some observational studies have shown that clinically indicated bronchoscopy without routine surveillance sampling of the lung allograft does not reduce the survival of lung transplant patients. Conclusions: bronchoscopy with transbronchial biopsy is a safe diagnostic procedure during the first year after lung transplantation to detect infections and early allograft rejection in asymptomatic patients, which can significantly improve long-term survival. After a quick, high-quality diagnosis, in the therapeutic plan for the treatment of acute complications after lung transplantation, powerful drugs are applied, which in a large number of cases give significant results. As part of the treatment of acute complications after kidney transplantation, immunosuppressants, antimicrobial agents, and immunoglobulins are used, and re-transplantation is not excluded as a procedure. Obtaining a donor, a quality organ, a superior surgical procedure and diagnostics are necessary for a successful lung transplantation. Also, maintaining a transplanted patient is a highly significant process with a large number of participants, procedures and therapies that represent the verification of the quality of the entire transplantation process and without which there is no success.

OBJECTIVE

The aim of the paper is to show the complexity of the lung transplantation process, which is reflected in the direct, complex implementation of the procedure.

In particular, we would like to highlight the diagnostic procedures and treatment after the lung transplantation procedure, which is an essential continuation of the surgical intervention, and in terms of complexity and importance, it is an extremely demanding and difficult procedure.

MATERIAL AND METHODS

One of the most important procedures in the monitoring of post-transplantation complications is bronchoscopy. Bronchoscopy, as an endoscopic method of direct examination of the tracheobronchial tree, has a significant role before and after lung transplantation. As a method before transplantation, it is used in order to assess the quality of the donor's lung parenchyma, with the extraction of bronchoalveolar lavage, which is sent for further additional microbiological and virological analyses. This procedure is not accepted as a standard operative procedure, but it is very important in the preparation for transplantation itself, and in the post-transplantation period. Bronchoscopy with bronchoalveolar lavage and transbronchial biopsy is performed after lung transplantation to assess the possibility of acute cellular rejection, as well as complications and infections of the respiratory tract, especially cytomegalovirus and lymphocytic bronchiolitis. Bronchoscopy, as a diagnostic procedure, is carried out with the goal of elimination of possible early and late complication after lung transplantation. Complications may be divided into local ones (dehiscence of primary anastomoses and pneumothorax) and systemic complications which include infections and graft rejection. The most common complication of respiratory pathways which occurs in the period of 1-4 weeks after transplantation is dehiscence of primary anastomoses which is characterized by blood flow defect through the bronchial arteries. (Figure 1) Complications that may occur in the first weeks after transplants are the primary graft dysfunction which is expected in the first 72 hours after transplantation, perihilar ground glass opacification, thickening of bronchial walls, predominantly in the middle and lower lung lobes, the tree-in-bud phenomenon (secretion-filled bronchioles with an inflammatory process) (Figure 2). Also, in the first weeks acute rejection of the graft may occur in 50-60% of cases in the form of : 1. Acute humoral rejection (hyperacute flow, minutes-hours, previously created Anti HLA At- form a sentence) (Figure 3) 2. Acute cellular rejection which is expected in the period from 5 to 10 days after the procedure (large lymphocytic infiltration) and appears as a severe tissue damage as a consequence of the activity of cytotoxic T lymphocytes. – elaborate the sentence, and which demands mandatory bronchoscopy with transbronchial biopsy. Radiological examination can detect progressive perihilar and basal opacification, pleural effusions, while ground glass opacifications (milky glass) with septal lines, nodules, consolidations are observed on the scanner. Absence of ground glass opacification excludes acute rejection (Figure 4). In the period of up to 6 months after lung transplantation, the most common complications are pulmonary embolism (27%), which can occur up to 4 months after transplantation and fungal infections caused by fungi from the Aspergillus genus. Fungal infection may also occur combined with CMV infection (full name of the virus -Cytomegalovirus ?) which leads to systemic expansion of infections in the body, affects the central nervous system and in a large percentage of

cases (in 90%) the outcome is fatal. What can also be expected in the same period is the occurrence of viral infections (CMV, EBV , HSV, Influenza) that can be treated with specific antiviral therapy, but weekly CMV PCR is definitely necessary in the first two months after transplantation. Tuberculosis, as another possible complication after lung transplantation, can be expected in the period of 3 months after the operation, but it is a good prognosis. In this period, another possible complication is bronchial stenosis, which appears in the period of 2-9 months after transplantation (Figure 5) . After a lung transplant, certain complications can be expected in the period after the expiration of 6 months from the transplantation. One of the possible complications is a chronic allograft rejection, which is expected in more than 50% of patients up to 5 years after surgery. PTLD – Posttransplant Lymphoproliferative Disease occurs in the form of B cell lymphoma within the first year after operations, while CLAD-Chronic lung allograft dysfunction-drop of FEV1 > 20% can occur with two clinical entities: 1. BOS-Bronchiolitis obliterans Sy which is characterized by a change in the small airways with obstructive ventilation. (Figure 6) 2. RAS-Restrictive allograft syndrome, which is characterized by a restrictive ventilation disorder, where the clinical picture shows a drop in FEV of 1 to 20% and a drop in TLC of more than 10%. This syndrome can have a slow or fast progression, but it certainly has a worse prognosis than BOS (Figure 7). After a period of one year after lung transplantation, recurrent diseases such as the recurrence of the primary disease, Sarcoidosis (in 35% of cases), Lymphagioleiomyomatosis, Langerhanscell histiocytosis, Giant cell pneumonitis, Alveolar proteinosis, Mycobacterium infection and Lung cancer can occur (Figure 8 where all complications from the first week to 6 months post op are presented)-

RESULTS

Conclusive work of a large number of experts along with exceptional teamwork and a multidisciplinary approach produces significant results both in reducing the number of complication and in the treatment of these complications. With this approach, transplantation has become standard procedure for treatment of patients with advanced phases of different pulmonary diseases.

CONCLUSION

A high-quality treatment of complications of lung transplantation requires a coordinated action of several teams of doctors in the field of pulmonology with a large number of consultants and an expert approach to solving complications. The fact that lung transplantation has become a standard procedure in many healthcare systems speaks to the advancement of medical procedures and successful treatment throughout the process. Prompt evaluation, correct diagnosis and targeted treatment is the key to a successful transplantation procedure that requires a unique multidisciplinary approach.

KEYWORDS

Bronchoscopy, transplantation, lungs, complications

P21 TRANSBRONHIJALNA BIOPSIJA

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UVOD

Transbronhijalna biopsija (TBB ili TBLB – transbronchial lung biopsy) je invazivna metoda koja se primenjuje u postavljanju definitivne histoloske dijagnoze kod lokalizovanih fokalnih i difuznih promena plucnog parenhima. TBB se izvodi u lokalnoj anesteziji kod hospitalnih i ambulantnih pacijenata. Senzitivnost i specificnost se povecavaju sa napredovanjem rentgenskih promjena i u odmaklom stadijumu bolesti. Kod nekih oboljenja (kao sarkoidoza), moze se dobiti karakteristicna histoloska slika i kada rentgenske promene se ne mogu uociti. Kada se vrsi pod fluoroskopskom kontrolom i uz vestog patologa, tocnost transbronhijale biopsije u dijagnostici lokalizovanih malignih tumora je preko 70%. Transbronhijalna biopsija pluća (TBB), takođe poznata kao „Bronhoskopska biopsija pluća" je dobro uspostavljena tehnika i obično se izvodi od strane pulmologa kako bi se dobili uzorci kod žarišnih i difuznih bolesti pluća. Ova tehnika ima nisku stopu morbiditeta i mortaliteta. Biopsija pluća je obavljana otvorenim hirurškim metodama do 1963 godine, kada je dr Anderson izvršio bronhoskopsku biopsiju pluća uz pomoć krutog bronhoskopa. Transbronhijalna biopsija pluća (TBLB ili TBBx) putem fleksibilne bronhoskopije (FB) uvedena je u ranih 1970-ih i od tada je široko korišćena. Postoje mnoge modifikacije tehnike transbronhijalne biopsije. Najčešće se izvodi zaglavljivanjem opsega u segmentni bronhus od interesa, a zatim propuštanjem forcepsa (kljesta) kroz radni kanal opsega i napredovanjem do obolelog regiona dok se ne oseti otpor. Nakon toga forceps se povlači oko 1 – 2 cm, čeljusti se otvaraju i šire se pažljivo, klešta napreduje do područja gde se pronalazi otpor i vilice se zatvaraju. Forceps za biopsiju mora biti čvrsto povučen da bi se dobio uzorak. Tokom postupka neki lekari pitaju pacijenta za neugodnost u ramena, grudima ili gornji deo trbuha sto bi ukazivalo na blizinu pleuralnog prostora, naročito ako se ne koristi fluoroskopija. Zatvaranje čeljusti kljesti u toku ekspirijuma je također uobičajena tehnika. Fluoroskopija je vrsta rentgenskog snimanja koja pruža kontinuiranu sliku na monitoru. Tokom fluoroskopije rentgenski zrak prolazi kroz tijelo i daje sliku kretanja dijela tijela ili instrumenta (može se videti detaljno na ekranu). Kontraindikacije za TBB su respiratorna slabost, mehanička ventilacija, kontralateralna pulmektomija, suspektne vaskularne lezije, apsces pluća, ehinokokna cista, plućna hipertenzija, bulozna bolest, tvrdokoran kašalj, koagulopatija, trombocitopenija.

CILJ

Cilj rada je utvrditi doprinos i ucinkovitost transbronhijalne biopsije u dijagnostickom algoritmu kod lokalizovanih i difuznih rentgenskih promena na plucima u hospitalizovanih i ambulatornih pacijenata

MATERIJALI I METODE

retrospektivnom analizom 20 godisnjeg perioda (2003-2023) razmotreni su 450 bronhoskopskih izvestaja sa uradjenom TBB (72 ambulantno, kod ostalih 378 TBB je bila uradjena u hospitalnim uslovima na Pulmoloskom odeljenju, iskljucivo retko kod hospitalizovanih sa drugih odeljenja Gradske opste bolnice "8-mi septemvri" u Skoplju). Kod svih su na radiografiji pluca bile uocene promene (fokalne ili dufuzne). Dijagnostika je ukljucivala sledece postupke: standardnu PA i profilnu radiografiju (kod vecine i CT sken grudnog kosa sa primenom intravenskog kontrasta), fiberopticku bronhoskopiju (u najvecem broju sa instrumentom marke Olympus BF TYPE 1T 180, redje Stortz-ovim fiberskopom) i transbronhijalnu biopsiju fleksibilnim forcepsom.

REZULTATI

prema radiografskom nalazu ispitanike (N 395) smo podelii u 4 kategorije Kategorija 1 (N 268) – Jednostrane lokalizovane promene prema polozaju i velicini rentgenskih promena opredelili smo dve podgrupe – centralne promene – periferne promene (velicine ispod 30mm, 30-60mm i preko 60mm) Kategorija 2 (N 42) – Jednostrane prosirene promene (tumorske lezije i atelektaze) Kategorija 3 (N 23) – Obostrane ogranicene promene Kategorija 4 (N 62) – Difuzne promene plucnih polja (intersticijske promene) Svi ispitanici su imali UREDAN endoskopski nalaz (u okviru fizioloskog za odredjene starosne dobi: bronhije slobodno prolazne do nivou subsegmenata, karine ostre, bez submukoznih ili drugih patoloskih infiltrata). Dominirao je muski pol (67%), starosti od18 do 88 godina. U 395 pacijenata uradjeno je ukupno 450 TBB (ponovljene su 55 biopsije – 12%). Konkluzivni histopatoloski nalaz (histoloski entitet/dijagnoza) dobiven je kod 270 (68%) pacijenata kod kojih je bilo uradjeno 306 biopsija (68% od ukupnog broja, 36 su bile ponovljene biopsije). U ostalih 125 (32%) pacijenata u kojih je bilo uradjeno 144 biopsija (19 ponovljenih), dobiveni histoloski nalazi su kategorisani kao „negativan nalaz". Konkluzivni ("pozitivni") histopatoloski nalazi (iz prve ili iz ponovljene TBB) su podeljeni u 5 grupe/kategorije • Non Small Cell Lung Carcinoma (ukljucivsi histopatoloske entitete Carcinoma planocellulare bronchogenes, Large cell i Adenocarcinoma (ukljucivsi carcinoma bronchioloalveolare) kao i neklasifikovanii nedovoljno definisani malignitet – 157 (58 %) • Small Cell Lung Carcinoma (Carcinoma microcellulare bronchogenes (ukljucivsi histopatoloskientitet Oat cell carcinoma i nalaz metastatskog depozita) – 51 (19%) • Sarcoidosis 16 (6%) • Tuberculosis (ukljucivsi miliarni oblik i nalaz nedovoljno definisanog granulomatoznog tkiva) – 19 (7%) • Drugi nalazi (kao "fibrosis", "hemosiderosis" i histoloski opisi koji su se klinicki uklapali u kategorije nemalignih entiteta ali su u velikoj meri i znacajno doprineli postavljanju (definisanju i formiranju) konacne dijagnoze – 27 (10 %) U 125 ispitanika iz prve i iz ponavljanih biopsija (ukupno 144) bio je dobiven nekonkluzivni („nedefinisan") histopatoloski nalaz (odgovor patologa nije bio dovoljno precizan, jasan ili definisan u pravcu maligniteta, hronicne upale i/ili druge benigne promene, ili je uzorak bio mali i nepodoban za histolosku obradu, sto je zahtevalo rebiopsiju od reprezentativnijeg mesta). Fluoroskopija je koriscena kod izvodjenja 404 biopsija (46 TBB su uradjene bez fluoroskopske kontrole, od kojih u 20 je bio dobiven „pozitivan" histopatoloski nalaz). Nisu zapazene vece komplikacije. Parcijalni pneumotoraks se

retko zapazao (u 13 – 3% slucajeva neposredno ili 24 casova nakon izvodjenja prve ili ponovljene biopsije). Obicno se radilo o malom samolimitirajucem obliku sto nije zahtevalo vecu intervenciju (tretman je bio konzervativan, retko je bila primenjena torakalna drenaza).

ZAKLJUČAK

Rezultati ovog ispitivanja ukazuju da je primena biopsije tokom bronhoskopskog pregleda neophodna u svih radiografski nejasnih parenhimskih plucnih infiltrata. TBB je bezbedna i jeftina invazivna dijagnosticka metoda za histolosku potvrdu promena u plucima. Pri dobrom selekcijom bolesnika koji nisu razjasnjeni postizu se solidni rezultati sa prihvatljivim komplikacijama. Strategija lecenja bronhijalnog karcinoma zahteva jasnu histopatolosku kategorizaciju. Saglasno time, kod nedovoljno definisanih histoloskih nalaza je indicirana rebiopsija. Ponavljane biopsije povecavaju dijagnosticki doprinos. Dijagnostički doprinos se može poboljšati fluoroskopijom u odabranoj populaciji pacijenata sa smanjenjem rizika od komplikacija. Fluoroskopski vođena transbronhijalna biopsija je vremenski efektivna, sigurna i efikasna metoda kod fokalnih i difuznih plućnih lezija.

KLJUČNE REČI

Transbronhijalna biopsija, bronhoskopija, histopatoloski nalaz, fluoroskopija

P21 TRANSBRONCHIAL BIOPSY

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INTRODUCTION

Transbronchial biopsy (TBB or TBLB – transbronchial lung biopsy) is an invasive method used to establish a definitive histological diagnosis in localized focal and diffuse changes in the lung parenchyma. TBB is performed under local anesthesia in hospital and outpatient patients. Sensitivity and specificity increase with the progression of X-ray changes and in the advanced stage of the disease. In some diseases (such as sarcoidosis), a characteristic histological picture can be obtained even when X-ray changes cannot be observed. When performed under fluoroscopic control and with an experienced pathologist, the accuracy of transbronchial biopsy in the diagnosis of localized malignant tumors is over 70%. Transbronchial lung biopsy (TBB), also known as "bronchoscopic lung biopsy" is a well-established technique and is commonly performed by pulmonologists to obtain samples in focal and diffuse lung disease. This technique has a low morbidity and mortality rate. Lung biopsy was performed by open surgical methods until 1963, when Dr. Anderson performed a bronchoscopic lung biopsy using a rigid bronchoscope. Transbronchial lung biopsy (TBLB or TBBx) via flexible bronchoscopy (FB) was introduced in the early 1970s and has been widely used since then. There are many modifications of the transbronchial biopsy technique. It is most commonly performed by jamming the scope into the segmental bronchus of interest, then passing the forceps through the working channel of the scope and advancing to the diseased region until resistance is felt. After that, the forceps are withdrawn about 1 - 2 cm, the jaws are opened and spread carefully, the forceps are advanced to the area where resistance is found and the jaws are closed. The biopsy forceps must be pulled firmly to obtain the specimen. During the procedure, some doctors ask the patient about discomfort in the shoulders, chest or upper abdomen that would indicate the proximity of the pleural space, especially if fluoroscopy is not used. Closing the jaws of the forceps during expiration is also a common technique. Fluoroscopy is a type of X-ray imaging that provides a continuous image on a monitor. During fluoroscopy, an X-ray beam passes through the body and gives an image of the movement of a part of the body or an instrument (can be seen in detail on the screen). Contraindications for TBB are respiratory weakness, mechanical ventilation, contralateral pulmectomy, suspicious vascular lesions, lung abscess, echinococcal cyst, pulmonary hypertension, bullous disease, persistent cough, coagulopathy, thrombocytopenia.

OBJECTIVE

The aim of the work is to determine the contribution and effectiveness of transbronchial biopsy in the diagnostic algorithm for localized and diffuse X-ray changes in the lungs in hospitalized and ambulatory patients

MATERIAL AND METHODS

in a retrospective analysis of a 20-year period (2003-2023), 450 bronchoscopic reports with performed TBB were considered (72 on an outpatient basis, in the other 378 TBB was performed in hospital conditions at the Pulmonology Department, exclusively rarely in patients hospitalized from other departments of the City General Hospital "8-mi September" in Skopje). In all of them, changes (focal or diffuse) were observed on the radiograph of the lungs. Diagnostics included the following procedures: standard PA and profile radiography (in most cases, a CT scan of the chest with the use of intravenous contrast), fiberoptic bronchoscopy (mostly with an Olympus BF TYPE 1T 180 instrument, rarely with a Stortz fiberscope) and transbronchial biopsy with a flexible forceps.

RESULTS

according to the radiographic findings, we divided the respondents (N 395) into 4 categories Category 1 (N 268) – Unilateral localized changes according to the position and size of the X-ray changes, we identified two subgroups – central changes – peripheral changes (sizes under 30mm, 30-60mm and over 60mm) Category 2 (N 42) – Unilateral extended changes (tumor lesions and atelectasis) Category 3 (N 23) – Mutual limited changes Category 4 (N 62) – Diffuse changes in lung fields (interstitial changes) All subjects had a PERFECT endoscopic finding (within the physiological range for a certain age: bronchi freely passing to the level of subsegments, carinae sharp, without submucosal or other pathological infiltrates). The male gender dominated (67%), aged from 18 to 88 years. A total of 450 TBBs were performed in 395 patients (55 biopsies were repeated - 12%). A conclusive histopathological finding (histological entity/diagnosis) was obtained in 270 (68%) patients in whom 306 biopsies were performed (68% of the total number, 36 were repeated biopsies). In the other 125 (32%) patients in whom 144 biopsies were performed (19 repeated), the obtained histological findings were categorized as "negative findings". Conclusive ("positive") histopathological findings (from the first or from repeated TBB) are divided into 5 groups/categories • Non Small Cell Lung Carcinoma (including the histopathological entities Carcinoma planocellulare bronchogenes, Large cell and Adenocarcinoma (including carcinoma bronchioloalveolare) as well as unclassified insufficiently defined malignancy - 157 (58%) • Small Cell Lung Carcinoma (Carcinoma microcellulare bronchogenes (including the histopathology of Oat cell carcinoma and the finding of a metastatic deposit) – 51 (19%) • Sarcoidosis 16 (6%) • Tuberculosis (including miliary form and the finding of insufficiently defined granulomatous tissue) - 19 (7%) • Other findings (such as "fibrosis", "hemosiderosis" and histological descriptions that clinically fit into the categories of non-malignant entities but contributed to a large extent and significantly to the establishment (definition and formation) of the final diagnosis - 27 (10%) In 125 subjects from the first and repeated biopsies (144 in total), an inconclusive ("undefined") histopathological finding was obtained (the pathologist's answer was not sufficiently precise, clear or defined in the direction of malignancy, chronic inflammation and/or other benign changes, or the sample was small and unsuitable for histological processing, which required a rebiopsy from a more representative site).

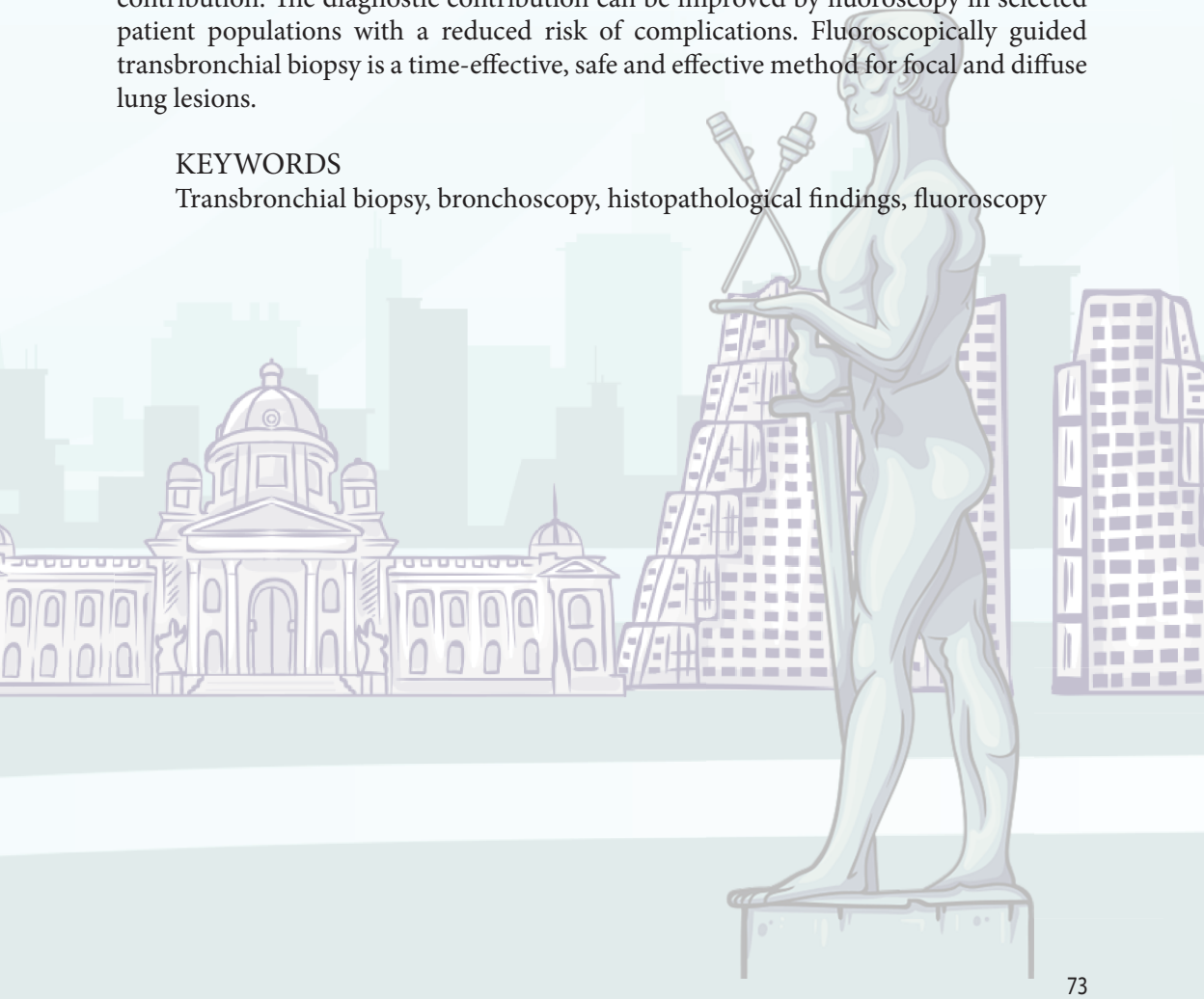
Fluoroscopy was used in the performance of 404 biopsies (46 TBB were performed without fluoroscopic control, in 20 of which a "positive" histopathological finding was obtained). No major complications were observed. Partial pneumothorax was rarely observed (in 13 – 3% of cases immediately or 24 hours after the first or repeated biopsy). It was usually a small self-limiting form that did not require major intervention (the treatment was conservative, thoracic drainage was rarely used).

CONCLUSION

The results of this study indicate that biopsy during bronchoscopic examination is necessary in all radiographically unclear parenchymal lung infiltrates. TBB is a safe and inexpensive invasive diagnostic method for histological confirmation of lung changes. With a good selection of patients who have not been clarified, solid results are achieved with acceptable complications. Bronchial cancer treatment strategy requires a clear histopathological categorization. Accordingly, rebiopsy is indicated for insufficiently defined histological findings. Repeated biopsies increase the diagnostic contribution. The diagnostic contribution can be improved by fluoroscopy in selected patient populations with a reduced risk of complications. Fluoroscopically guided transbronchial biopsy is a time-effective, safe and effective method for focal and diffuse lung lesions.

KEYWORDS

Transbronchial biopsy, bronchoscopy, histopathological findings, fluoroscopy



P22 ENDOSKOPSKI I MIKROBIOLOŠKI NALAZI FIBERBRONHOSKOPIJE KOD PACIJENATA SA BRONHIEKTAZIJAMA

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UVOD

Bronhiektazije predstavljaju hroničnu respiratornu bolest karakterisanu kliničkim sindromom sa kašljem, produkcijom sputuma i bronhijalnom infekcijom kao i radiološki sa nalazom abnormalne i stalne dilatacije bronhija.

CILJ

Uloga bronhoskopije u protokolima lečenja i dijagnostike bronhiektazija do sada nije u potpunosti definisana.

MATERIJALI I METODE

Istraživanjem je obuhvaćeno 50 pacijenata starosne dobi od 37 do 82 godine, muškog i ženskog pola sa MSCT radiografijom verifikovanim bronhiektazijama kod kojih je učinjena dijagnostička ili terapijska fiberbronhoskopija u periodu od 2020-2023. godine u Klinici za pulmologiju UKCS.

REZULTATI

Prosečna starost pacijenata bila je 62.76 godine sa većim brojem pacijenata ženskog pola (29 prema 21). Dominantan endoskopski nalaz u ženskoj populaciji bili su znaci inflamacije u odnosu na uredan nalaz (25/4) dok je kod muškog pola taj odnos 14/7. Ukupno 39 od 50 pacijenata je imalo znakove inflamacije u odnosu na 11 sa urednim nalazom. Negativan nalaz mikrobioloških nalaza imala su 29 pacijenata, od 21-og pacijenta sa mikrobiološkim izolatima kod 10 je izolovano više od jednog mikroba, dok je najčešće izolovan Pseudomonas aeruginosa u 9 slučajeva (18%), potom Klebisella sa 4 (8%), te H. influenzae, Streptococcus pneumoniae i Staphylococcus aureus u 3 navrata, kod jednog pacijenta je pristigao PCR+ nalaz na Mycobacterijum tuberculosis. S obzirom na učestalu kolonizaciju mikroorganizmima kod ¾ pacijenata bronhiektazije su očekivano davale endoskopski nalaz inflamacije. Prema statistikama iz poslednjih deset godina dominacija Pa u odnosu na Hi, Sa i Sp više odgovara rezultatima kineskih i turskih istraživanja gde je učestalost izolata Pa 20-30% a Hi oko 10%, u odnosu na UK, Zapadnu Evropu (Hi 20-29%, Pa 8-12%) i Australiju (Hi 23-47%, Pa oko 12%). Na malom uzorku pacijenata Klebsiella se izdvojila kao drugi najčešći uzročnik što je atipično u odnosu na dosadašnja istraživanja.

ZAKLJUČAK

U ovom delu sveta na malom uzorku ispitanika P. aeruginosa se istakao kao najčešći kolonizator ili uzročnik. Potrebna su dalja ispitivanja na većem broju pacijenata kako bi se utvrdilo jasno mesto bronhoskopije u dijagnostici i lečenju bronhiektazija.

KLJUČNE REČI

Bronhiektazije, bronhoskopija, Pseudomonas aeruginosa, Klebsiella enterobacter

P22 ENDOSCOPIC AND MICROBIOLOGICAL FINDINGS OF FIBERBRONCHOSCOPY IN PATIENTS WITH BRONCHIECTASIS

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INTRODUCTION

Bronchiectasis is a chronic respiratory disease characterized by a clinical syndrome with cough, sputum production and bronchial infection, as well as radiological findings of abnormal and permanent bronchial dilatation.

OBJECTIVE

The role of bronchoscopy in the protocols of treatment and diagnosis of bronchiectasis has not yet been fully defined.

MATERIAL AND METHODS

The research included 50 patients aged 37 to 82, male and female, with bronchiectasis verified by MSCT radiography, who underwent diagnostic or therapeutic fiberbronchoscopy in the period from 2020-2023. in the Clinic for Pulmonology UCCS, Belgrade.

RESULTS

The average age of the patients was 62.76 years with a higher number of female patients (29 vs. 21). The dominant endoscopic findings in the female population were signs of inflammation in relation to normal findings (25/4), while in males this ratio was 14/7. A total of 39 out of 50 patients had signs of inflammation compared to 11 with normal findings. 29 patients had negative microbiological findings, of the 21 patients with microbiological isolates, more than one microbe was isolated in 10 patients, while Pseudomonas aeruginosa was most often isolated in 9 cases (18%), followed by Klebisella with 4 (8%), and H. influenzae, Streptococcus pneumoniae and Staphylococcus aureus on 3 occasions, one patient received a PCR+ finding for Mycobacterium tuberculosis. Due the frequent colonization by microorganisms in ¾ of the bronchiectasis patients, endoscopic findings of inflammation were expected. According to statistics from the last ten years, the dominance of Pseudomonas (Pa) in relation to Haemophilus influenzae (Hi), Staphylococus aureus (Sa) and Streptococcus pneumoniae (Sp) corresponds more to the results of Chinese and Turkish research, where the frequency of Pa isolates is 20-30% and Hi is about 10%, compared to the UK, Western Europe (Hi 20-29 %, Pa 8-12%) and Australia (Hi 23-47%, Pa about 12%). In a small sample of patients, Klebsiella stood out as the second most common causative agent, which is atypical compared to previous researches.

CONCLUSION

In this part of the world, on a small sample of respondents, P. aeruginosa stood out as the most common colonizer or causative agent. Further studies on a larger number of patients are needed in order to determine the clear place of bronchoscopy in the diagnosis and treatment of bronchiectasis.

KEYWORDS

Bronchiectasis, bronchoscopy, Pseudomonas aeruginosa, Klebsiella enterobacter

P23 ENDOSKOPSKI ASPEKTI TRAHEOBRONHIJALNIH ABNORMALNOSTI – DESETOGODIŠNJE ISKUSTVO

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APSTRAKT

Cilj ovog rada je da se procene bronhoskopske promene kod malformacija bronhijalnog stabla kod dece. Materijal i metode. Retrospektivna studija desetogodišnjeg perioda sa 32202 hospitalizovana pacijenta. Bronhoskopija je realizovana kod 2304 (7,15%) dece. Malformacija bronhijalnog stabla nađena je kod 32 (1,4%). Starost dece je od 10 meseci do 15 godina (glavni = 2,9 god). Muškarci su bili 19 pacijenata. Odnos polova (muško/žensko) bio je 1,46:1. Sva 32 pacijenta su podvrgnuta standardizovanim istraživanjima. Rezultati. Klinički nalazi: Kod 22 (68,75%) bolesnika vodeći simptom je bio kašalj; vlažan bronhitični nalaz kod 15 (46,87%); teškoće disanja kod 5 (15,62%); stridor u 3 (9,36%). Petoro dece je bilo sa iskašljavanjem, a visoka temperatura je zabeležena kod 9 (28,12%). Rendgenski nalaz: senke dispergovanog infiltrata kod 15 (46,87%); konsolidacija parenhima kod 4 (12,5%); peribronhijalne promene-4 (12,5%), hiperinflacija-7 (21,87%), kolaps donjeg režnja-1 (3,12%). Bronhoskopski nalaz: ageneza levog pluća kod 1 (3,12%) bolesnika, lingvalna i ageneza levog niskog režnja-2 (6,24%), situs inversus pulmonum-1 (3,12%), traheomalacija -3 (9,36%); topografske anomalije- trahealni bronh kod 9 (28,12%) dece, prekobrojni segmentni bronhus-13 (40,62%); subnumerarni segmentni bronhus-3 (9,36%). ZAKLJUČAK. Umesto niskog procenta malformacija disajnih puteva (bronhografija je zlatni standard u dijagnozi), naši rezultati naglašavaju značaj bronhoskopske evaluacije bronhijalnog stabla kao suštinske korisne intervencije za kliničara. To ga vodi do koraka koje mora da napravi.

P23 ENDOSCOPIC ASPECTS OF TRACHEO-BRONCHIAL ABNORMALITIES- 10 YEARS REVIEW

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ABSTRACT

The aim of this study is to evaluate the bronchoscopic changes in bronchial tree malformation in children. Material and methods. Retrospective study of ten years period with 32202 hospitalized patients. Bronchoscopy was realized in 2304 (7.15%) children. Malformation of the bronchial tree was found in 32 (1.4%). The age of children vas 10 months to 15 years (main= 2.9 yrs). Male were 19 patients. Gender ratio (male/female) was1.46:1. All 32 patients underwent standardized investigations. Results. Clinical findings: In 22 (68.75%) patients leading symptom was cough; chest rales were presented in 15 (46.87%); breathing difficulties in 5 (15.62%); stridor in 3 (9.36%). Five children were with expectoration and high temperature was noted in 9 (28.12%). X-ray findings: dispersed infiltrate shadows in 15 (46.87%); parenchyma consolidation in 4 (12.5%); peribronchial changes-4 (12.5%), hyperinflation- 7 (21.87%), collapse of the low lobe-1 (3.12%). Bronchoscopic finding: left lung agenesis in 1 (3.12%) patient, lingual and left low lobe agenesis-2 (6.24%), situs inversus pulmonum-1 (3.12%), tracheomalatio -3 (9.36%); topographic anomalies- tracheal bronchus in 9 (28.12%) children, supernumerary segmental bronchus-13 (40.62%); subnumerary segmental bronchus-3 (9.36%). Conclusion. Instead of the low percentage in airways malformation (bronchography is a gold standard in diagnosis) our results accent the significance of bronchial tree bronchoscopic evaluation as essential useful intervention for the clinician. It leads him to the steps he has to make.

P24 BRONCHIAL ASPIRATE VERSUS INDUCED SPUTUM IN DIAGNOSIS OF TUBERCULOSIS CASE REPORT

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ABSTRACT

Microbiology sampling of sputum smear is the most usual procedure for the diagnosis of the tuberculosis. However, sputum sampling is only 70% accurate, there still around 30% of patients who remain negative. We present case report of 68 years old female patient with recurrent episodes of malaise, weakness and constant sub febrile fever. X rays showed infiltrative change in the right upper lobe, not clearly delineated from the surroundings, with mild fibrotic lines towards right hilus. Inflammatory markers such as CRP, fibrinogen, erythrocyte sedimentation rate and leukocites were increased. At this point sputum smears for standard TBC findings (microscopy, Xpert, culture) were negative. Patient had two cycles of antibiotic therapy, started with amoxicillin + clavulonide acid, then macrolide, and in between Oseltamivir for five days. Two weeks after finishing the treatment, symptoms relapsed, worsened with respiratory failure. Patient was hospitalized, CT scan was performed showing same, previously described infiltrative lesion of the right upper lobe with fibrotic lining towards right hillus, nodular change in the right middle lobe and ground glass opacification in apical and middle lobes of the right lung. Inflammatory markers were highly increased, standard microbiology for sputum, nasal and pharyngeal smear remained negative after incubation. Treatment with third generation cephalosporin was parenterally administered, but without resolution of clinical state. Bronchoscopy was performed, no endoscopic finding in both bronchial branches, bronchial aspirate was taken, and it was positive for all standard TBC findings. Patient had been submitted to TBC clinic, and after treatment per TBC protocol there was resolution in symptoms and clinical findings.

APSTRAKTI PREDAVAČA

KADA SE ODLUČITI ZA ICS/LABA/LAMA U ASTMI?

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APSTRAKT

Globalno, mali procenat (5-12%) pacijenata sa astmom ima težak oblik bolesti tj tešku astmu. Međutim, upravo pacijenti sa teškom astmom su nesrazmerno veliki korisnici zdravstvenih resursa. Globalna inicijativa za lečenje astme (GINA) preporučuje lečenje pacijenata sa astmom inhalacionim kortikosteroidima plus b2-agonistima dugog dejstva i dodavanjem dugodelujućeg antagonista muskarinskih receptora (LAMA) ili biološke terapije kod pacijenata sa umerenom do teškom nekontrolisanom astmom. Muskarinski antagonisti dugog dejstva imaju dokazanu ulogu u lečenju hronične opstruktivne bolesti pluća. Kod astme, muskarinski antagonisti (i kratkog i dugotrajnog dejstva) su istorijski smatrani manje efikasnim od b2-agonista; tek relativno nedavno su sprovedene studije za procenu efikasnosti LAMA, kao dodatna terapija. Ove studije su dovele do odobrenja prvog LAMA, tiotropijuma, kao dodatne terapije kod pacijenata sa nedovoljno kontrolisanom astmom. Ovaj režim preporučuje GINA kao korak optimizacije za pacijente sa teškom astmom pre nego što se započne lečenje biološkom terapijom ili sistemskim kortikosteroidima. Sprovedenim studijama dokazano je da tripla terapija poboljšava kontrolu astme i smanjuje učestalost egzacerbacija kod pacijenata sa umerenom do teškom astmom koji su nekontrolisani uprkos upotrebi ICS-LABA. Zaključeno je da benefit od triple terapije mogu imati pacijenti koji su nedovoljno kontrolisani uz maksimalnu dozu ICS/LABA, imaju česte egzacerbacije i pušači opterećeni respiratornim simptomima. Fenotipizacija igra ključnu ulogu u individualizovanom lečenju teške astme. Međutim, kao ciljane terapije, njihova primena će i dalje biti usmerena na pacijente sa određenim fenotipovima koji ispunjavaju specifične kriterijume za upotrebu utvrđene u kliničkim ispitivanjima.

KADA SE ODLUČITI ZA ICS/LABA/LAMA U ASTMI?

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ABSTRACT

Globally, a small proportion (5–12%) of asthma patients are estimated to have severe disease, ie sever asthma. However, patients with severe asthma are disproportionately high healthcare resource users. The Global Initiative for Asthma (GINA) management recommends treating patients with asthma with inhaled corticosteroids plus long-acting β2-agonists and, adding a long-acting muscarinic receptor antagonist or biologic agent in patients with moderate to severe uncontrolled asthma. Long-acting muscarinic antagonists (LAMAs) have a recognized role in the management of chronic obstructive pulmonary disease. In asthma, muscarinic antagonists (both short- and long-acting) were historically considered less effective than β2-agonists; only relatively recently have studies been conducted to evaluate the efficacy of LAMAs, as add-on therapy. These studies led to the approval of the first LAMA, tiotropium, as an add-on therapy in patients with poorly controlled asthma. This regimen is recommended by GINA as an optimization step for patients with severe asthma before any biologic or systemic corticosteroid treatment is initiated. Previous studies showed that triple therapy improves asthma control, and reduces exacerbations in patients with moderate to severe asthma who are uncontrolled despite the use of ICS-LABA. It was concluded that patients who are uncontrolled with the maximum dose of ICS/LABA, have frequent exacerbations and smokers burdened with respiratory symptoms can benefit from triple therapy. Phenotyping play key roles in the individualized treatment of severe asthma. However, as targeted therapies, their application will continue to be focused on patients with certain phenotypes who meet the specific criteria for use as identified in clinical trials.

RADIJALNI ENDOBRONHIJALNI ULTRAZVUK

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APSTRAKT

Dijagnoza perifernih plućnih lezija (PPL) za interventne pulmologe je uvek izazovna. Kompjuterskom tomografijom vođena transtorakalna aspiracija iglom (CT-TTNA) i endobronhijalna ultrasonografija sa vodičem (guide sheat) (EBUS-GS), nazvana i radijalni EBUS (R-EBUS), transbronhijalna biopsija pluća, su važne metode za dijagnozu PPL. Bez dovoljno dokaza, kontroverzno je koji je bolji izbor za dijagnostikovanje PPL. Izazov sa bronhoskopskim uzorkovanjem PPL je dvostruk. Prvi izazov je navigacija bronhijalnog stabla do PPL, a drugi izazov je dobijanje uzorka iz lezije. Najjednostavniji bronhoskopski modalitet koristi fleksibilni bronhoskop sa ili bez fluoroskopskog navođenja. Nažalost, sa 30–60%, doprinos fleksibilne bronhoskopije za PPL je suboptimalan. Ovo je dovelo do razvoja novih bronhoskopskih procedura kao što su radijalni endobronhijalni ultrazvuk, elektromagnetna navigaciona bronhoskopija (ENB), virtuelna bronhoskopija (VB), ultratanka bronhoskopija. Među ovim tehnikama bronhoskopske navigacije, R-EBUS, kao uobičajen i moćan alat, preporučen je za dijagnozu PPL od strane Američke asocijacije grudnih hirurga (AATS) i Evropskog društva za medicinsku onkologiju (ESMO). Prve rezultate senzitivnosti za R-EBUS dao Herth 2002. godine, sa širokim opsegom prijavljenih dijagnostičkih rezultata između 50,0 % i 97,6 %, i stopama komplikacija između 0 % i 18,4 %. Poslednja metaanaliza objavljena 2023.g. sadržala je 46 studija sa ukupno 7252 PPL. Objedinjeni dijagnostički doprinos R-EBUS-a bio je 73,4 % (95 % CI: 69,9 %–76,7 %), sa značajnom heterogenošću otkrivenom među studijama ($I2 = 90$ %, $P < 0,001$). Dalja analiza je pokazala PPL locirane u srednjem ili donjem režnju, veličine >2 cm, malignog tipa, solidnog izgleda na kompjuterizovanoj tomografiji (CT), prisutnog pozitivanog bronhijalnog znaka, lokacija unutar sonde i dodavanje brzog očitavanja rezultata na licu mesta – rapid on site (ROSE) bile su povezane sa povećanim dijagnostičkom senzitivnošću, dok upotreba (GS), tipa bronhoskopije i multimodalnog pristupa nisu uspeli da utiču na ishod. Objedinjene stope incidencije ukupnih komplikacija, pneumotoraksa, umerenog i teškog krvarenja bile su 3,1%. Najnovija bronhoskopska tehnika – robotski asistirana bronhoskopija (RAB) omogućila je poboljšanu vizualizaciju i pristup malim i teško dostupnim PPL. RAB studije su međutim prvenstveno sprovedene u akademskim centrima, ograničavajuća im je generalizacija rezultata, dok je varijabilnost u definicijama dijagnostičkog doprinosa narušiena validnošću poređenja unakrsnih studija. Iako najnovije bronhoskopske tehnike omogućavaju preciznu navigaciju do PPL, dijagnostička vrednost je i dalje niža od one dobijene sa CT-TTNA. Transbronhijalna plućna kriobiopsija navođena RP-EBUS-om uz poželjnu navigaciju omogućava dobijanje većih uzoraka tkiva, time je i dijagnostička vrednost veća, pozitivan rezultat dobija se kod PPL koja su uz bronh a ne u nejmu, a takođe je kriobiopsijom povećana površina zahvatanja PPL te je svime navedenim dijagnostička vrednost za PPL ovom

metodom povećana. Rizik od krvarenja i pneumotoraksa nije znatno veći u poređenju sa prethodno navedenim tehnikama uzorkovanja, uz napomenu da kriobiopsija za PPL još uvek nije standardizovana procedura u odnosu na primenu kriobiopsije pluća kod intersticijskih bolesti pluća. KLJUČNE REČI: perifriferne plućne lezije, radijalni endobronhijalni ultrazvuk, transbronhijalna plućna kriobiopsija

RADIJALNI ENDOBRONHIJALNI ULTRAZVUK

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ABSTRACT

The diagnosis of peripheral lung lesions (PPL) is always challenging for interventional pulmonologists. Computed tomography-guided transthoracic needle aspiration (CT-TTNA) and endobronchial ultrasonography with guide sheath (EBUS-GS), also called radial EBUS (R-EBUS), transbronchial lung biopsy, are important methods for the diagnosis of PPL. Without sufficient evidence, it is controversial which is the better choice for diagnosing PPL. The challenge with bronchoscopic sampling of PPL is twofold. The first challenge is navigating the bronchial tree to the PPL, and the second challenge is obtaining a sample from the lesion. The simplest bronchoscopic modality uses a flexible bronchoscope with or without fluoroscopic guidance. Unfortunately, at 30–60%, the contribution of flexible bronchoscopy for PPL is suboptimal. This led to the development of new bronchoscopic procedures such as radial endobronchial ultrasound, electromagnetic navigation bronchoscopy (ENB), virtual bronchoscopy (VB), ultrathin bronchoscopy. Among these bronchoscopic navigation techniques, R-EBUS, as a common and powerful tool, has been recommended for the diagnosis of PPL by the American Association of Thoracic Surgeons (AATS) and the European Society of Medical Oncology (ESMO). The first sensitivity results for R-EBUS were given by Herth in 2002, with a wide range of reported diagnostic results between 50.0% and 97.6%, and complication rates between 0% and 18.4%. The last meta-analysis was published in 2023. contained 46 studies with a total of 7252 PPL. The pooled diagnostic yield of R-EBUS was 73.4 % (95 % CI: 69.9 %–76.7 %), with significant heterogeneity detected among studies ($I2 = 90$ %, $P < 0.001$). Further analysis showed PPL located in the middle or lower lobe, size >2 cm, malignant type, solid appearance on computed tomography (CT), positive bronchial sign present, intra-probe location and addition of rapid on site examination (ROSE), were associated with increased diagnostic sensitivity, while the use of (GS), type of bronchoscopy and multimodal approach failed to influence the outcome. The pooled incidence rates of total complications, pneumothorax, moderate and severe bleeding were 3.1%. The latest bronchoscopic technique, robot-assisted bronchoscopy (RAB) has enabled improved visualization and access to small and hard-to-reach PPL. However, RAB studies were primarily conducted in academic centers, limiting the generalizability of results, while variability in definitions of diagnostic contribution impaired the validity of cross-study comparisons. Although the latest bronchoscopic techniques allow precise navigation to the PPL, the diagnostic value is still lower than that obtained with CT-TTNA. Transbronchial lung cryobiopsy guided by RP-EBUS with desirable navigation allows obtaining larger tissue samples, thus the diagnostic value is higher, a positive result is obtained in PPLs that are next to the bronchus and not in the neem, and cryobiopsy also increases the area of involvement of PPLs and is with all of the above, the diagnostic value for PPL is increased by this

method. The risk of bleeding and pneumothorax is not significantly higher compared to the previously mentioned sampling techniques, noting that cryobiopsy for PPL is still not a standardized procedure compared to the use of lung cryobiopsy in interstitial lung diseases. KEYWORDS: peripheral lung lesions, radial endobronchial ultrasound, transbronchial lung cryobiopsy

ENDOSCOPIC LUNG VOLUME REDUCTION (ELVR) FOR CAVITARY TB

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APSTRAKT

Endoskopsko smanjenje zapremine pluća se široko koristi kao opcija za lečenje HOBP, rešavajući hiperinflaciju zahvaćenog plućnog tkiva. Druga moguća indikacija za ELVR je destruktivna plućna tuberkuloza. Primena jeftine, bezbedne, jednostavne za postavljanje lokalno proizvedene endobronhijalne valvule može dati šansu za zatvaranje plućne šupljine i negativizaciju sputuma kod 50-75% pacijenata, spasavajući ih od agresivne operacije.

ENDOSCOPIC LUNG VOLUME REDUCTION (ELVR) FOR CAVITARY TB

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ABSTRACT

Endoscopic lung volume reduction is widely used as an option for COPD treatment, resolving hyperinflation of affected pulmonary tissue. Another possible indication for ELVR is a destrutive pulmonary tuberculosis. Application of cheap, safe, simple in placement locally produced endobronchial valve can give a chance to close pulmonary cavity and sputum negativation in 50-75% of patients, saving them from aggresive surgery.

PERKUTANA TRAHEOSTOMIJA

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APSTRAKT

Perkutana traheotomija je hiruška, minimalno invazivna terapijska metoda kojom se stvara veštački otvor (traheostoma) na prednjem zidu vratnog dela dušnika, i tako obezbeđuje disajni put i ventilacija pacijenta. Poslednjih nekoliko decenija perkutana traheotomija je dobro ustanovljena procedura u jedinicama intezivnog lečenja. Najčešća indikacija za izvodjenje traheotomije jeste produžena mehanička ventilatorna potpora intubiranih pacijenata. Vreme konverzije sa translaringealne tube na ventlaciju putem traheostome i dalje je predmet rasprave u stručnim krugovima. Ranije se smatralo da su gojaznost pacijenta, prisustvo koagulopatije, nemogućnost zabacivanja glave pacijenta, visoka zavisnost od ventilatora kao i traheotomja u hitnim stanjima relativne kontraindikacije. Međutim, nedavno objavljeni podaci ukazuju na bezbednost perkutane traheotomije i kod ovih grupacija pacijenata. Utvrđeno je da su ultrazvuk i bronhoskopija veoma korisni tokom izvođenja intervencije. Ultrazvuk se može koristiti pre intervencije za identifikaciju vaskularnih struktura i odabir optimalnog mesta punkcije, a posle procedure za procenu pneumotoraksa. Bronhoskopija pruža vizuelno vođenje iz lumena traheje i smanjuje komplikacije poput paratrahealne punkcije i povrede zadnjeg zida traheje. Iskustvo sa odabranom tehnikom rada i pažljivo planiranje su uslov bez koga se ne može, kako bi se sve eventualne komplikacije svele na minimum.

PERKUTANA TRAHEOSTOMIJA

Zdravko Brković[1], Živka Usković-Stefanović[1], Spasoje Popević [1,2] Jasmina Opačić [1], Maja Omčikus [1,2] Irina Čokrlić [1], Ivana Sekulović-Radovanović [1], Zlatan Bojić [1]

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ABSTRACT

Percutaneous tracheotomy is a surgical, minimally invasive, therapeutic method that creates an artificial opening (a tracheostomy) on the front wall of the neck of the trachea, thus ensuring the patient's airway and ventilation are free from obstructions. During the last few decades, percutaneous tracheotomy has been a commonly performed surgical procedure in intensive care units. The most common indication for percutaneous tracheotomy is prolonged mechanical ventilation support of patients who have been intubated. The ideal timing for the procedure has still not been agreed upon as of the present date. Although obesity, emergency tracheostomy, coagulopathy, inability to extend the neck and high ventilator dependency were initially thought to be a relative contraindication, recent data suggest that percutaneous tracheostomy has been proven safe in these specific patient populations. Ultrasound and bronchoscopy are useful adjunct tools for optimizing the performance of the procedure itself. Ultrasound can be used pre-procedurally to identify the vascular structure and select the optimal puncture site as well as post-procedurally to evaluate the pneumothorax. Bronchoscopy provides visual guidance from within the tracheal lumen and can reduce complications, such as paratracheal punctures and injury to the posterior tracheal wall. Experience with the technique and careful planning are needed to minimize any avoidable potential complications.

ANESTEZIOLOGIJA U INTERVENTNOJ PULMOLOGIJI

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APSTRAKT

Napredak u medicinskom znanju i ubrzan tehnološki razvoj omogućili izvođenje velikog broja sofisticiranih i složenih invazivnih dijagnostičkih i terapijskih procedura van operacione sale. U pulmologiji, postoje brojne metode interventne pulmologije koje se izvode pomoću fleksibilne i rigidne bronhoskopije kao što su: laser terapija, elektrokauterizacija, argon plazma koagulacija, krioterapija, brahiterapija, endobronhijalni ultrazvuk itd. Anestezija u interventnoj pulmologiji zavisi od vrste procedure i može biti: topikalna (površinska) anestezija, „monitored anasthesia care“ (MAC)koja predstavlja kombinaciju topikalne anestezije i analgosedacije i opšta anestezija. U zavisnosti od vrste koja se primenjuje, anesteziju može dati bronholog i/ili anesteziolog. Zajedničko za sve vrste anestezija jeste da se moraju izvoditi u prostorima i sa opremom koji omogućavaju isti stepen sigurnosti i visokih standarda koje pruža i operaciona sala. Potom, priprema pacijenta mora biti adekvatna. Posebnu pažnju treba obratiti na procenu rizika od pojave krvarenja tokom bronhoskopije i pripremu pacijenata u tom smislu, jer ono predstavlja najozbiljniju komplikaciju interventnih procedura u pulmologiji. Specifičnost anestezije u bronhologiji jeste isto “polje delovanja” bronhologa i anesteziologa, što često predstavlja dodatni problem, naročito vezano za ventilaciju pacijenta. U ovom radu iznete su detaljne preporuke za sve pomenute vidove anestezije važećih vodiča britanskog torakalnog udruženja, kao i evropskog i američkog udruženja anesteziologa. Unapređenjem saradnje bronhologa i anesteziologa, podiže se nivo kvaliteta rada. Poštujući date preporuke, svakodnevni rad treba prilagoditi svakom pojedinačnom bolesniku i aktuelnim uslovima rada. KLJUČNE REČI: anestezija u interventnoj pulmologiji, topikalna (površinska) anestezija, monitored anaesthesia care, opšta anestezija.

ANESTEZIOLOGIJA U INTERVENTNOJ PULMOLOGIJI

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ABSTRACT

Advances in medical knowledge and accelerated technological development have made it possible to perform a large number of sophisticated and complex invasive diagnostic and therapeutic procedures outside the operating room. In pulmonology, there are numerous methods of interventional pulmonology that are performed using flexible and rigid bronchoscopy such as: laser therapy, electrocautery, argon plasma coagulation, cryotherapy, brachytherapy, endobronchial ultrasound, etc. Anesthesia in interventional pulmonology depends on the type of procedure and can be: topical (surface) anesthesia, "monitored anesthesia care" (MAC), which is a combination of topical anesthesia and analgosedation, and general anesthesia. Depending on the type being administered, anesthesia can be administered by a bronchologist and/or an anesthesiologist. Common to all types of anesthesia is that they must be performed in spaces and with equipment that provide the same level of safety and high standards as in the operating room. Then, the preparation of the patient must be adequate. Special attention should be paid to the assessment of the risk of bleeding during bronchoscopy and the preparation of patients in this sense, because it represents the most serious complication of interventional procedures in pulmonology. The specificity of anesthesia in bronchology is the same "field of action" of bronchologists and anesthesiologists, which often represents an additional problem, especially related to patient ventilation. This paper presents detailed recommendations for all mentioned types of anesthesia of the valid guidelines of the British Thoracic Society, as well as the European and American Society of Anesthesiologists. By improving the cooperation between bronchologists and anesthesiologists, the level of quality of work is raised. Respecting the given recommendations, daily work should be adapted to each individual patient and current working conditions. KEYWORDS: anesthesia in interventional pulmonology, topical (surface) anesthesia, monitored anesthesia care, general anesthesia.

KADA POZVATI PRIPRAVNOG BRONHOLOGA: INDIKACIJE I KONTRAINDIKACIJE

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APSTRAKT

Od svog uvođenja u svakodnevnu medicinsku praksu krajem 20. veka, bronhoskopija ima sve veću ulogu u različitim kliničkim scenarijima i sve više se koristi u lečenju kritično bolesnih pacijenata.Poznavanje jedinstvenih karakteristika kritično obolelih pacijentana , poznajavnje indikacija i kontraindikacija za samu proceduru, od najveće je važnosti za postizanje optimalnih rezultata, uz minimiziranje potencijalnih rizika i komplikacija. Bronhoskopija koja se izvodi na terenu u okviru pripravnosti ima svoje specifičnosti koje su posledica činjenice da su u pitanju kritično oboleli pacijenti koji su sami po sebi visokorizični za intervenciju sa jedne strane,a sa druge strane specifični su i uslovi u kojima se intervencija izvodi. Apsolutna bezbednost tokom celog pregleda se ne može garantovati ,ali je sama hitnost čini imperativom i vrši pritisak na bronhologa .Bez obzira na faktor koji je izazvao kritičnu bolest nestabilan karakter bolesti kod ovih pacijenta nameće vremenska ograničenja što dodatno povećava pritisak bronhologu pri čemu je vitalna indikacija često sama indikacija iznad relativne kontraindikacije. Prostor za manipulaciju sveden je na minimum i uslovi su različiti od kontrolisanog okruženja u bronhološkoj sali. Odluka o izvođenju bronhoskopije može se doneti samo kompromisom između rizika I koristi.Ozbiljni neželjeni događaji vezani za samu intervenciju uglavnom su posledica nedostatka stručnosti ili neobezbeđenih mera predostrožnosti.

KADA POZVATI PRIPRAVNOG BRONHOLOGA: INDIKACIJE I KONTRAINDIKACIJE

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ABSTRACT

Since its INTRODUCTION into everyday medical practice in the late 20th century, bronchoscopy has increasingly played a significant role in various clinical scenarios and is being more widely utilized in the treatment of critically ill patients. Understanding the unique characteristics of critically ill patients, along with knowledge of the indications and contraindications for the procedure, is of utmost importance for achieving optimal outcomes while minimizing potential risks and complications. Bronchoscopy performed in emergency settings has its specificities because these patients are inherently high-risk for intervention on one hand, and on the other hand, the conditions under which the intervention is conducted are specific. Absolute safety throughout the entire examination cannot be guaranteed, but the urgency of the situation makes it imperative and places pressure on the bronchoscopist. Regardless of the factor that caused the critical illness, the unstable nature of the disease in these patients imposes time constraints, further increasing the pressure on the bronchoscopist, where the vital indication often outweighs relative contraindications. The scope for manipulation is minimized, and conditions differ from a controlled environment in a bronchoscopy suite. The decision to perform a bronchoscopy can only be made through a compromise between risks and benefits. Serious adverse events related to the procedure are mostly due to a lack of expertise or inadequate precautionary measures.

AKTUELNOSTI U LEČENJU PLUĆNIH FIBROZA

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APSTRAKT

Aktuelnosti u lečenju plućnih fibroza Intersticijalne bolesti pluća (ILD) obuhvataju heterogenu grupu bolesti i karakterišu ih fibrozne i/ili inflamatorne lezije. Nastaju u plućnom parenhimu koji obuhvata alveole, alveolarni epitel, kapilarni endotel i prostore između ovih struktura pa je ILD je takođe poznata kao difuzna parenhimska bolest pluća. Glavni izazov za kliničare i istraživače i dalje predstavlja patogeneza, dijagnoza, klasifikacija i lečenje ILD. Najčešći simptom koji se vidi kod pacijenata sa ILD je dispneja, ali ponekad se ILD mogu manifestovati i samo jednim simptomom kao što je kašalj. Farmakološki tretman uključuje antifibrotike. Antifibrotici su prvobitno bili uključeni kod idiopatske plućne fibroze (IPF). Koncept progresivne plućne fibroze (PPF) obuhvata fibrotične bolesti pluća, osim IPF-a, koje se razvijaju u periodu od jedne godine. Trenutne ILD klasifikacije su zasnovane na morfološkim, etiološkim faktorima, a pacijenti mogu biti istovremeno klasifikovani u više od jedne kategorije. PPF je deskriptivni termin koji se primenjuje za bilo koju dijagnozu fibrozne ILD uključujući pacijente sa bolestima vezivnog tkiva (CTD-ILD), idiopatskim NSIP, sarkoidozom, hipersenzitivnim pneumonitisom, profesionalnim ILD i one sa intersticijskom bolesti pluća koja se ne može klasifikovati. Rana dijagnoza je od velikog značaja zbog progresivne prirode ovih bolesti, kako bi se blagovremeno počelo sa lečenjem i na taj način uticalo na usporavanje progresije bolesti. Nintedanib je inhibitor tirozin kinaze koji se može davati u preporučenim dozama i kontraindikovan je u slučajevima trudnoće i dojenja. Pirfenidon ima antifibrotičku i antitrombotičku aktivnost bez specifičnih kontraindikacija. Treprostinil je analog prostaciklina koji ima antitrombotička svojstva i obično se izbegava kod pacijenata sa bolestima jetre. Svi ovi lekovi imaju svoje odgovarajuće terapijske doze ali može se reći i zajedničke neželjene efekte uključuju mučninu, povraćanje, infekcije itd. Bez obzira na to ovi lekovi su značajno uticali na usporavanje progresije bolesti a samim tim i na kvalitet života ovih pacijenata. Pirfenidon i nintedanib su pokazali svoj benefit kod pacijenata sa ILD, najpre u smislu usporavanja opadanja forsiranog vitalnog kapaciteta (FVC). U lečenju ILD bitna je i nefarmakološka terapija, koja pomaže pacijentima da žive zdravije takođe utiče na progresiju bolesti, a procedura transplantacije pluća produžava i poboljšava kvalitet života pacijenata sa ILD. Mnoga istraživanja koja su u toku u budućnosti mogu promeniti tok i prognozu ove grupe bolesti.

AKTUELNOSTI U LEČENJU PLUĆNIH FIBROZA

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ABSTRACT

What is new in the treatment of interstitial lung diseases Interstitial lung diseases (ILDs) comprise an heterogenous group and characterized by fibrotic and/or inflammatory lesions. They becoming in lung parenchyma who includes the alveoli, the alveolar epithelium, the capillary endothelium, and spaces between these structures. ILD is also known as diffuse parenchymal lung disease. A major challenge for clinicians and researchers still present pathogenesis, diagnosis, classification and treatment of ILDs. The most common symptom seen in patients is dyspnea, but sometimes they may also present with symptoms as coughing. Pharmacological treatment include antifibrotics. Antifibrotics were initially launched in idiopathic pulmonary fibrosis (IPF). The concept of progressive pulmonary fibrosis (PPF) describe like fibrotic lung diseases other than IPF that develop, within a period of 1 year. Current ILD classifications are based on the morphological, etiological factors, and natural history and patients may be simultaneously classified in more than one category. PPF is a descriptive term applied to any fibrotic ILD diagnosis including patients with CTD-ILD, idiopathic NSIP, sarcoidosis, hypersensitivity pneumonitis, occupational ILD and those with otherwise unclassifiable disease. Progressive nature of these disease entities, early diagnosis is of great importance in order to ensure timely therapeutic intervention and slowdown of disease progression. Nintedanib is a tyrosine kinase inhibitor that can be given in their advised doses and is contraindicated in cases of pregnancy and lactation. Pirfenidone has anti-fibrotic and anti-thrombotic activity with no specific contraindications. Treprostinil is an analogue of prostacyclin that has anti-thrombotic properties and is usually avoided in patients with hepatic disorders. All of these new drugs have their own respective doses and specific modes of delivery, but some common side effects that they share include nausea, vomiting, infections, etc. These drugs have opened a new path for the treatment of ILD and have improved the recovery outcomes of patients. Pirfenidone and nintedanib are beneficial in patients with ILD, as they decelerate the rate of decline in forced vital capacity (FVC). In the treatment of ILD also is more important non farmacological terapy, that helps the patients live a healthier life and helps to decrease the progression of the disease, and Lung transplantation procedure extends and improves the quality of life for patients with ILD. Many ongoing research trials can change the prognosis of this group of diseases in the future

„HOT" INTERVENTNE PROCEDURE - LASER, APC, EC

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APSTRAKT

Termoablativne procedure (laser, argon plazma koagulacija i elektrokauterizacija) imaju ključnu ulogu u interventnoj bronhoskopiji, tj. u terapiji različitih endobronhijalnih bolesti kao i u sanaciji krvarenja disajnih puteva. Ove procedure svoj lokalni ablativni efekat ostvaraju putem rigidne ili fleksibilne bronhoskopije. Dve najčešće indikacije za termoablativne procedure su endoluminalna opstrukcija disajnog puta (benigna ili maligna) i krvarenje. Bronhoskopska laser terapija je brzodelujuća, palijativna ili dodatna terapija u rešavanju opstrukcije centralnog disajnog puta. Postoji više tipova od kojih se najviše koristi neodimijum-itrijum-aluminijum-granat (ND YAG). Svoj efekat ostvaruje isecanjem, koagulacijom i isparavanjem tkiva. Bronhoskopska argon plazma koagulacija (APC) je elektrohirurška, nekontaktna termoablativna tehnika koja proizvodi toplotu iz argon gasa. Ova toplota se potom koristi za uklanjanje tkiva i/ili ostvarivanje hemostaze. Nasuport APC-u, elektrokauterizacija predstavlja skup procedura koje zahtevaju direktan kontakt sa tkivom, a efekat razaranja postižu toplotom koja je generisana visokofrekventnom električnom strujom.

„HOT" INTERVENTNE PROCEDURE - LASER, APC, EC

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ABSTRACT

Thermal ablative techniques (laser, argon plasma coagulation and electrocautery) have a crucial role in interventional bronchoscopy, addressing a spectrum of endobronchial diseases as well as managing airway bleeding. Through rigid or flexible bronchoscopy, they are used to deliver locally ablative therapy. The two most common indications to use thermal ablative techniques are airway obstruction with endoluminal disease (benign or malignant) and bleeding. Bronchoscopic laser therapy is a rapidly acting, palliative, or adjuvant therapy used to relieve central airway obstruction (CAO). It has several types, with neodymium-yttrium-aluminum-garnet (ND YAG) being the most commonly used one. It has cutting, coagulation and vaporazing features. Bronchoscopic argon plasma coagulation (APC) is an electrosurgical, noncontact thermal ablation technique that generates heat from argon gas. This heat can then be used to debride and debulk airway tissue and/or establish hemostasis. As opposed to APC, electrocautery encompasses a group of techniques that are contact-based, established by the flow of high-frequency electrical current that generates heat and causes tissue destruction.

ROBOTIC BRONCHOSCOPY

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ABSTRACT

The increasing detection of small pulmonary nodules (SPNs) presents challenges in patient management due to uncertain risks. Biopsy is often necessary for accurate diagnosis, with transthoracic needle aspiration (TTNA) and bronchoscopic biopsy being common methods. Robotic bronchoscopy (RB) has emerged as a promising alternative, offering improved stability and accuracy. RB platforms, such as Monarch™, Ion™, and Galaxy System™, employ advanced technology for precise navigation and biopsy. While RB shows high accuracy and low complication rates, challenges include CT-to-body divergence and high costs. Future research is needed to optimize RB's diagnostic yield, define procedural outcomes, and explore its therapeutic potential in lung cancer management. Despite promising advancements, comprehensive studies are lacking, highlighting the need for ongoing research to fully realize RB's capabilities. INTRODUCTION The rising incidence of small pulmonary nodules (SPNs) detected incidentally or through screening adds complexity to patient management, as the risk associated with these nodules remains uncertain. Various risk stratification algorithms based on nodule and patient characteristics have been developed to guide clinical decision-making. However, many SPNs fall into an intermediate risk category, necessitating biopsy for accurate diagnosis. Transthoracic needle aspiration (TTNA) and bronchoscopic biopsy are common non-surgical methods for SPN biopsy. TTNA, guided by imaging techniques such as CT, offers high diagnostic accuracy but carries risks of pneumothorax and hemorrhage. Bronchoscopic biopsy, particularly flexible fiberoptic bronchoscopy, is safer but has limited diagnostic yield for peripheral lesions, especially those smaller than 2 cm. Navigational bronchoscopy, facilitated by techniques like radial endobronchial ultrasound (rEBUS) and electromagnetic navigation bronchoscopy (ENB), enhances diagnostic yield by providing real-time guidance to target lesions. However, the diagnostic accuracy of ENB has been questioned, particularly regarding false-negative results. Despite advancements, real-world data and follow-up studies reveal variability in diagnostic yield and challenges in maintaining precision during navigational bronchoscopy procedures. This has prompted the development of robotic bronchoscopy (RB) platforms, offering the promise of improved stability and accuracy in lesion localization and biopsy. Since the FDA approval of the first robotic bronchoscopy (RB) platform in 2018, RB has garnered significant attention for its potential in diagnosing and treating peripheral pulmonary lesions. Initial pilot studies suggested RB's high accuracy in pulmonary nodule management, attributed to its machine-controlled stability and integrated navigation. However, subsequent research has raised questions about these claims without diminishing interest in RB's potential. Robotic Bronchoscopy The evolution of Robotic Bronchoscopy (RB) mirrors the advancements made in robotic surgery. In 2018, the unveiling of the Monarch™

platform by Auris Health, Inc. initiated a similar transformative journey in bronchoscopy. Each RB platform employs a proprietary omnidirectional bronchoscope affixed to a robotic arm, guided by pre-procedure CT scans for precise navigation. Despite the considerable initial investment and ongoing maintenance costs, these systems promise groundbreaking capabilities. For instance, pre-clinical studies with the Monarch system demonstrated impeccable navigational accuracy, access to a greater number of bronchial divisions, and an impressive diagnostic yield. Subsequently, the Ion™ endoluminal RB platform by Intuitive Surgical© received FDA clearance in 2019, distinguishing itself with shape-sensing technology. Unlike the Monarch system, Ion utilizes fiberoptic bend sensors within the catheter itself, eliminating reliance on electromagnetic fields for orientation. Four years later, the Galaxy System™ by Noah Medical, pending FDA clearance, offers a cost-competitive alternative with innovative digital tomosynthesis guidance. Each system boasts unique features and technical specifications. The Monarch™ platform integrates an articulating bronchoscope and sheath controlled by independent robotic arms, facilitating precise maneuverability. In contrast, the Ion™ system utilizes a single ultrathin bronchoscope with shape-sensing technology, enhancing localization within the airway. The Galaxy System™, promises affordability and versatility through digital tomosynthesis-guided navigation. These advancements in robotic bronchoscopy represent a paradigm shift in diagnostic techniques, promising improved patient outcomes and enhanced procedural precision. As ongoing research and clinical trials continue to validate these technologies, the future of bronchoscopic interventions appears increasingly promising. Advantages of RB: The key advantage of RB systems is precise computerized control, enhancing navigation and tool delivery accuracy. Studies demonstrate high localization rates with RB platforms like Monarch™ and Ion™, along with low complication rates, notably for pneumothorax and bleeding. RB systems also excel in navigation software, showing superior pathway generation compared to electromagnetic navigation. While diagnostic yields have shown variability, RB compares favorably to transthoracic needle aspiration (TTNA) in terms of yield and complication rates. Cost analyses suggest potential cost benefits over TTNA in the long run. Further studies are needed to explore these potential advantages comprehensively. Limitations of RB: A significant technical challenge facing RB systems is CT-to-body divergence, where discrepancies arise between pre-procedural CT images and the actual lesion location during bronchoscopy. This issue can lead to repositioning of the bronchoscope and decreased diagnostic yield. Proposed solutions include optimizing patient positioning, adjusting ventilation parameters, and minimizing procedure times. Additionally, standardized training and certification programs may be necessary to ensure competency among practitioners. However, assessing skill acquisition and determining competency criteria remain challenges. Moreover, the high cost of robotic systems and lack of transparency regarding initial costs and maintenance pose barriers to widespread adoption, particularly in low- and middle-income settings. Further research is needed to address these limitations and optimize the use of RB technology. Future of RB The rapid progress of RB has surpassed the capacity of comprehensive studies to delineate procedural attributes and outcomes. Challenges like reduced diagnostic yields due to

CT-to-body divergence highlight this disparity, with solutions such as CBCT proposed before extensive cohort studies on RB itself. The notion that visualized tool-in-lesion equates to diagnostic yield has proven complex, as evidenced by studies showing high visualization rates but lower diagnostic yields. To accurately demonstrate the utility of costly advanced imaging systems like CBCT, improvements in biopsy tool design and pathology evaluation techniques are imperative. Central to enhancing diagnostic yield and accuracy is the need to precisely define these terms. Diagnostic yield quantifies the likelihood of establishing a diagnosis, while diagnostic accuracy measures the number of correct diagnoses. Discordant definitions, such as labeling non-specific findings as diagnostic for benign disease, can artificially inflate diagnostic yield. Standardized definitions are essential for meaningful comparisons moving forward. Considering that 60% of NSCLC cases are adenocarcinomas requiring next-generation sequencing, evaluating RB's diagnostic yield for molecular diagnosis is crucial. Studies comparing the molecular yield of RB systems will be vital but reliant on consistent definitions of diagnostic yield. While direct comparisons among RB systems are limited, shape-sensing RB has shown promise similar to digital tomosynthesis-assisted EMN in one prospective study. Integration with existing OR and radiology equipment is likely to influence platform choice, despite the absence of clear performance data. RB's stability has sparked considerable interest in therapeutic bronchoscopy, with ongoing human trials exploring various ablation techniques for lung cancers. Efforts are also underway to enhance immunotherapy through direct intratumoral injection of chemotherapy and other agents. RB may also play a crucial role in peri-operative nodule marking for minimally invasive thoracic surgery. Moreover, RB holds potential for facilitating a comprehensive approach to the diagnosis, staging, and treatment of early-stage lung cancer, particularly in light of emerging evidence favoring segmentectomy over lobectomy for stage IA non-small-cell lung cancer. While the full scope of RB therapeutics may not be realized for several years, continued advancements in RB technology are inevitable, surpassing the pace of research documenting their efficacy. Conclusions RB is currently in a phase akin to the early stages of robotic surgery, lacking comprehensive studies demonstrating its benefits. While the performance and complication rates of available RB systems seem comparable, RB shows promise in achieving high diagnostic yields, particularly in specialized centers with a focus on malignancy. However, substantial challenges remain in accurately quantifying RB's diagnostic yield and procedural characteristics, necessitating large-scale, multicenter, prospective trials. The rapid pace of innovation further complicates this task, highlighting the need for ongoing research to fully understand RB's capabilities.

DILEME U LEČENJU LAKE ASTME

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APSTRAKT

Procena je da astmu ima oko 339 miliona ljudi širom sveta, dok se čak 50–75% klasifikuje kao laka astma. Dok je definicija teške astme široko prihvaćena u kliničkoj praksi, definicija lake astme nije toliko jasna. Trenutno se definiše kao astma koja je dobro kontrolisana sa terapijom inhalatornim kortikosteroidom (IKS)/formoterol po potrebi ili sa niskom dozom IKS i po potrebi kratkodelujući beta agonista (SABA). Bez obzira na mali intenzitet simptoma, inflamacija disajnih puteva, iako varijabilna u intenzitetu, uvek je prisutna. Adherenca na regularnu inhalatornu terapiju sa IKS kod ovih pacijenata je veoma loša, pacijenti se oslanjaju na SABA i prekomerno ih koriste. Pacijenti obično smartaju da nisu u riziku od pogoršanja i da im ne treba preventivna terapija, obično potcenjuju težinu svoje bolesti. Medjutim čak i pacijenti sa lakom astmom su u riziku su od teških pogoršanja. Egzacerbacije variraju od pogoršanja simptoma koja remete svakodnevni život i produktivnost rada do teških i opasnih po život pogoršanja, čak i letalnog ishoda. Prema podacima iz kliničkih studija 18,8–22,0% pacijenata sa blagom astmom ima najmanje jedno teško pogoršanje u prethodnoj godini. Pogoršanja najčešće nastaju tokom virusnuh infekcija. In vitro i in vivo studije pokazuju da HRV infekcija, verovatno najčešći uzrok prehlade, izaziva ekspresiju širokog spektra citokina (IL-1b, IL-6, IL-11), faktora rasta (GCSF,GM-CSF) i hemokina što može dovesti do aktiviranje i regrutovanje inflamatornih ćelije u disajne puteve. Prema rezultatim meta analize pacijenti sa lakom astmom lečeni samo sa SABA po potrebi imali su srednju stopu pogoršanja, svih težina čak 2,88 po pacijentu po godini. Upotreba samo SABA u terapiji lake astme je bila paradoks u prethodnim smernicama te je u GINA smernicama 2019.g. došlo do fundamentalnih promena koje se odnose na to da SABA kao monoterapija nije više preporučena u terapiji lake astme. Primena IKS redukuje rizik od egzacerbacija i dovodi do postizanja kontrole simptoma, može da se koristi regularno svaki dan ili po potrebi IKS/formoterol kada postoje tegobe. IKS/formoterol po potrebi prevenira teške egzacerbacije isto kao primena IKS redovno. Manje je opterećenje organizma sa IKS ukoliko se koristi po potrebi. Pacijentima sa lošom adherencom preporučuje se terapija IKS/formoterol po potrebi, dok pacijenatima kod kojih dominiraju simptomi u odnosu na pogoršanja preporučuje se redovna terapija sa IKS.

DILEME U LEČENJU LAKE ASTME

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ABSTRACT

It is estimated that 339 million people worldwide have asthma, while 50-75% are classified as mild asthma. While the definition of severe asthma is widely accepted in clinical practice, the definition of mild asthma is not so clear. It is currently defined as asthma that is well controlled with inhaled corticosteroid (ICS)/formoterol therapy as needed or with low-dose ICS and short-acting beta agonist (SABA) as needed. Regardless of the low intensity of symptoms, airway inflammation, although variable in intensity, is always present. Adherence to regular inhalation therapy with ICS in these patients is very poor, patients rely on SABAs and overuse them. Patients usually think that they are not at risk of worsening and that they do not need preventive therapy, they usually underestimate the severity of their disease. However, even patients with mild asthma are at risk of severe exacerbations. Exacerbations vary from worsening of symptoms that disrupt daily life and work productivity to severe and life-threatening exacerbations, even with a fatal outcome. According to data from clinical studies, 18.8–22.0% of patients with mild asthma have at least one severe exacerbation in the previous year. Exacerbations most often occur during viral infections. In vitro and in vivo studies show that HRV infection, probably the most common cause of the common cold, induces the expression of a wide range of cytokines (IL-1b, IL-6, IL-11), growth factors (GCSF, GM-CSF) and chemokines that can lead to activation and recruitment of inflammatory cells into the airways. According to the results of the meta-analysis, patients with mild asthma treated only with SABA as needed had a mean exacerbation rate of all severity as high as 2.88 per patient per year. The use of only SABA in the treatment of mild asthma was a paradox in the previous guidelines, and in the 2019 GINA guidelines, there were fundamental changes related to that SABA as monotherapy is no longer recommended in the treatment of mild asthma. The use of ICS reduces the risk of exacerbations and leads to the achievement of symptom control, it can be used regularly every day or as needed ICS/formoterol when there are symptoms. ICS/formoterol as needed prevents severe exacerbations as well as regular ICS administration. There is less burden on the body with ICS if it is used as needed. Patients with poor adherence are recommended ICS/formoterol therapy as needed, while patients in whom symptoms predominate over exacerbations are recommended regular ICS therapy.

UNIPORTALNI VATS

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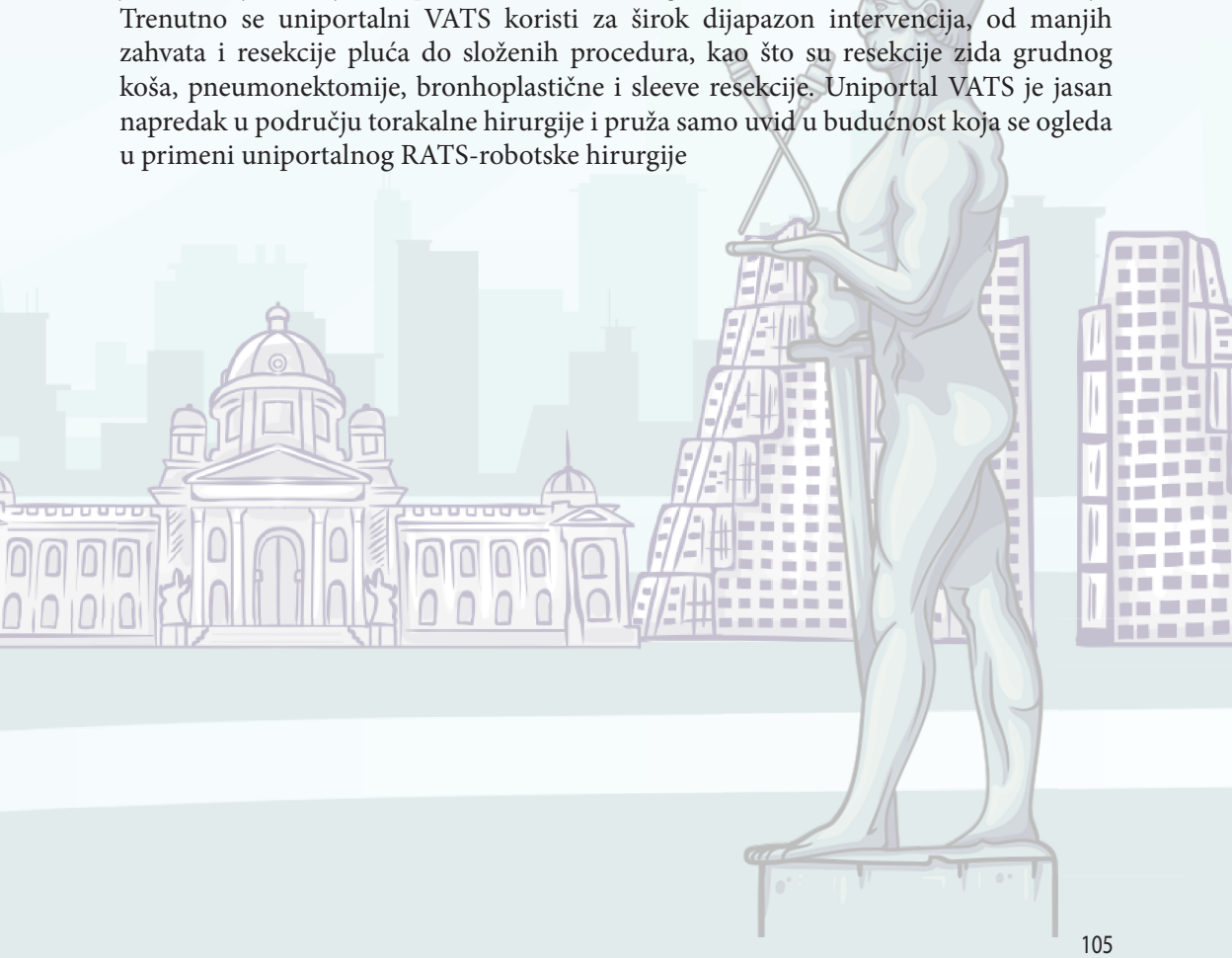
APSTRAKT

Videoasistirana torakoskopija (VATS) kod koje se koristi samo jedna incizija za izvođenje operacije, poznatija kao uniportalni VATS, osvojila je svet torakalne hirurgije tokom prethodnih nekoliko godina. Zahvaljujući napretku u tehnici i tehnologiji, hirurzi su u mogućnosti da izvode sve složenije zahvate koristeći jednu inciziju od 3 cm, čime se izbegava morbiditet standardne torakotomije. Ovo je bio prirodni nastavak onoga što većina prepoznaje kao standard lečenja za ranu fazu karcinoma pluća, VATS lobektomije, koja se u većini centara izvodi tehnikom s tri ili četiri incizije (porta). Poboljšana optika kamere omogućila je upotrebu manjih kamera, čineći uniportalni pristup tehnički lakšim. Poboljšanje u zglobnim sistemima instrumenata i razvoj drugih rotikulacionih instrumenata su takođe pomogli mogućnost operisanja kroz jednu manju inciziju. Uniportalna tehnika omogućava uslove rada slične torakotomiji. Trenutno se uniportalni VATS koristi za širok dijapazon intervencija, od manjih zahvata i resekcije pluća do složenih procedura, kao što su resekcije zida grudnog koša, pneumonektomije, bronhoplastične i sleeve resekcije. Uniportal VATS je jasan napredak u području torakalne hirurgije i pruža samo uvid u budućnost koja se ogleda u primeni uniportalnog RATS-robotske hirurgije



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ABSTRACT

Video-assisted thoracoscopy (VATS) in which only one incision is used to perform the operation, commonly known as uniportal VATS, has taken the world of thoracic surgery by storm over the past few years. Thanks to advances in technique and technology, surgeons are able to perform increasingly complex procedures using a single 3 cm incision, thereby avoiding the morbidity of standard thoracotomy. This was a natural extension of what most recognize as the standard of care for early-stage lung cancer, VATS lobectomy, which is performed in most centers using a three- or four-incision (port) technique. Improved camera optics enabled the use of smaller cameras, making the uniportal approach technically easier. Improvements in the articulating systems of the instruments and the development of other roticulating instruments have also aided the possibility of operating through a smaller incision. The uniportal technique allows working conditions similar to thoracotomy. Currently, uniportal VATS is used for a wide range of interventions, from minor procedures and lung resections to complex procedures, such as chest wall resections, pneumonectomies, bronchoplastic and sleeve resections. Uniportal VATS is a clear advance in the field of thoracic surgery and provides only a glimpse of the future that is reflected in the application of uniportal RATS-robotic surgery

DUALNA BRONHODILATACIJA U HOBP

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APSTRAKT

Bronhodilatatori su osnova lečenja HOBP. Dok su kratkodelujući bronhodilatatori opcija za pacijente sa povremenom dispnejom i malim rizikom od egzacerbacija, njihova upotreba za redovno lečenje se ne preporučuje. Većina pacijenata ima osećaj nedostatak daha što dovodi do ograničenja fizičke aktivnosti u vreme postavljanja dijagnoze i može zahtevati intenzivnije lečenje nego samo kratkodelujućim bronhodilatatorima. Za ove pacijente, bez obzira da li su u većem riziku od egzacerbacija ili ne, dugodelujući bronhodilatatori (kao monoterapija ili u kombinaciji) se preporučuju kao preferirani izbor lečenja prema aktuelnim smernicama. Kod nekih pacijenata, posebno onih u riziku od egzacerbacije ili sa težim simptomima, dvostruka bronhodilatacija se može preporučiti kao početna terapija. Monoterapija dugodelujućim bronhodilatatorima ima prednosti u nizu parametara (ograničenje protoka vazduha, dispneja, fizička aktivnost/kapacitet vežbanja, zdravstveno stanje i prevencija egzacerbacija); međutim, mnogi pacijenti ostaju simptomatski uprkos lečenju. Kada su simptomi nekontrolisani ili se pojave egzacerbacije, lečenje treba prilagoditi u cilju boljeg ublažavanja simptoma i smanjenja rizika od pogoršanja. Identifikovanje potrebe za modifikacijom lečenja može biti izazov, pošto pacijenti sa HOBP često smanjuju nivo fizičke aktivnosti kako bi smanjili intenzitet simptoma. Dvostruka bronhodilatacija poboljšava funkciju pluća u poređenju sa primenom jednog bronhodilatatora. Trenutno ne postoje jasne preporuke o tome koji klinički pokazatelji bi naveli pacijenta i lekara da razmotre eskalacije lečenja sa mono- na dualnu bronhodilataciju ili da li neki pacijenti treba da počnu sa dvostrukom terapijom ranije u pokušaju da zadrže svoj fizički kapacitet. Globalna inicijativa za hroničnu opstruktivnu bolest pluća (GOLD) objavila je opšte kriterijume za eskalaciju ili deeskalaciju lečenja, na osnovu perzistencije simptoma i daljih pogoršanja.

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ABSTRACT

Bronchodilators are a cornerstone of COPD treatment. While short-acting bronchodilators are an option for patients with occasional dyspnea at low risk of exacerbations, their use as regular treatment is not recommended. The majority of patients have breathlessness leading to exercise limitation at the time of diagnosis, and may require more intensive treatment than short-acting bronchodilators alone. For these patients, whether or not they are also at higher risk of exacerbations, long-acting bronchodilators (as monotherapy or in combination) are recommended as a preferred treatment choice in current guidelines. In some patients, particularly those at risk of exacerbation or with severe symptoms, dual bronchodilation can also be considered as initial therapy. Long-acting bronchodilator monotherapy has benefits across a range of parameters (airflow limitation, dyspnea, physical activity/exercise capacity, health status, and preventing exacerbations); however, many patients remain symptomatic despite treatment. When symptoms are uncontrolled or exacerbations occur, treatment should be adjusted with the aim of providing better symptom relief and reducing exacerbation risk. Identifying the need for treatment modification can be challenging, as patients with COPD often reduce physical activity levels in order to reduce symptom intensity. Dual bronchodilation improves lung function compared with a single bronchodilator. Currently, there are no clear recommendations on which clinical indicators would prompt a patient and physician to consider stepping up treatment from mono- to dual bronchodilation or whether some patients should be started on dual therapy earlier in an attempt to maintain exercise capacity. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) has issued some general criteria of escalating or de-escalating treatment, based on persistent symptoms and further exacerbations.

EVOLUCIJA TRANSBRONHIJALNE IGLENE ASPIRACIJE

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Transbronhijalna aspiracija iglom (TBNA) je uspostavljena tehnika prikupljanja ćelija i tkiva. Uzorci iz lezija izvan zida disajnih puteva, uglavnom su dobijeni iglom koja je vođena fleksibilnim bronhoskopom pod direktnom vizualizacijom mesta punkcije. Konvencionalna TBNA (cTBNA) se koristi već 40 godina, od kada je kroz fleksibilni bronhoskop prvi put primenjena 1978. g od strane Vang-a i saradnika. Kompjuterizovana tomografija grudnog koša kao i endobronhijalni orijentiri su inicijalno korišćeni za odabir mesta punkcije zida bronha. Značajna prekretnica u istoriji moderne dijagnostičke bronhoskopije dogodila se pronalaskom endobronhijalne transbronhijalne ultrazvučno vođene aspiracija iglom (EBUS-TBNA). EBUS-TBNA koristi ultrazvučnu tehnologiju preko sonde na distalnom vrhu bronhoskopa za izvođenje TBNA hilarnih i medijastinalnih lezija pod direktnom vizualizacijom ultrazvučnim slikama. Upoređen sa medijastinoskopijom, EBUS-TBNA je za stadiranje medijastinalnih limfnih čvorova kod potencijalno resektabilnih karcinoma pluća efikasan preko 90%, a specifičnost i pozitivna prediktivna vrednost kao i kod medijastinoskopije dostiže i do 100%. Konveksna sonda (CP)-endobronhijalnog ultrazvuka je u velikoj meri zamenila konvencionalnu TBNA (cTBNA) i od medijastinoskopije preuzela primat „zlatnog standarda" za proceduru stadiranja karcinoma pluća.

Navigaciona bronhoskopija koristi navigacioni sistem za vođenje instrumenata kroz disajne puteve za uzorkovanje ciljne lezije. Navigacioni sistemi mogu biti virtuelna (virtuelna bronhoskopska navigacija, obično CT bez kontrasta) ili elektromagnetna (ENB). Različite tehnologije navigacije, uključujući virtuelnu bronhoskopiju i praćenje u realnom vremenu pomoću EMN-a platforme, su komercijalno dostupne. Svaki od komercijalno dostupnih sistema koristi malo drugačije tehnologije za pristup i uzimanje uzorka. Nova tehnologija, elektromagnetno navođenje transtorakalne aspiracije iglom (ETTNA), uključuje jedinstveni elektromagnetni sistem navođenja koji omogućava kliničarima da prate solitarne plućne nodule (SPN) i ciljaju ih bez upotrebe CT u realnom vremenu u operacionoj sali ili bronhoskopskom kabinetu.

Dijagnostička tačnost trenutno dostupnih bronhoskopskih alata ipak ostaje ograničena, što poziva na značajnu potrebu za inovativnijim uređajima. Otuda se koncept robotske bronhoskopije pojavio sa nadom prevazilaženja ograničenja drugih tehnika uzorkovanja vođenih slikom. Prvi robotski bronhoskopski sistem je dobio odobrenje za komercijalnu upotrebu 2018. godine. Sistem kombinuje robotski kontrolisan kateter, sa direktnom vizuelizacijom disajnih puteva, koji se kreće kroz disajne puteve duž virtuelnog puta do ciljne lezije.

Napredak koji je napravila napredna dijagnostička bronhoskopija najavljuje nastavak inovacija i rešenja sa unapređenim sistemima za što bolji dijagnostički uspeh.

Index autora