Современ хируршки третман на каротидната болест

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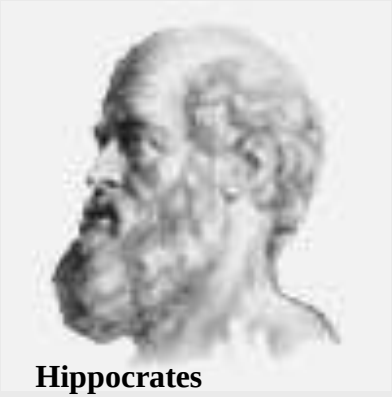
“Филип Втори” Скопје - Македонија

Декември, 2010

Историја


Hippocrates

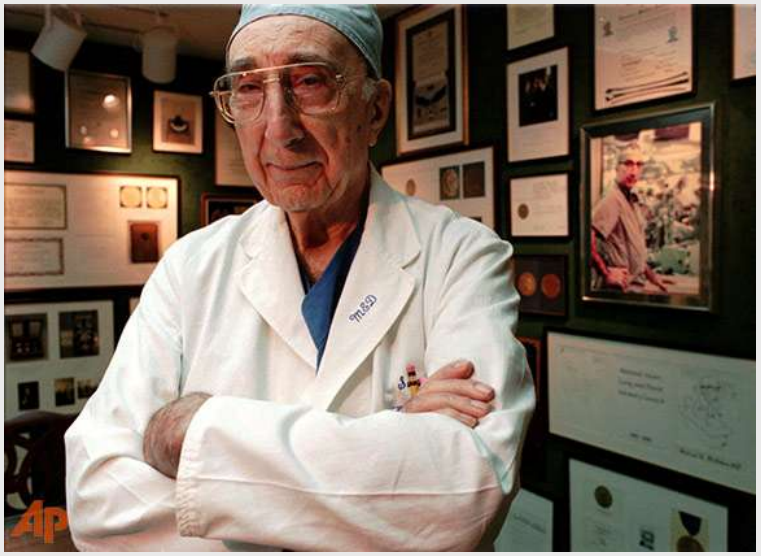
Hippocrates, 400год. пред н.е. Каротидна компресија
На грчки: Karos – “длабок сон”
Karoun – “to stupefy”

Chiari, 1905год. - 7 од 400 последователни аутопсии со оклузија на каротидни артерии, 4 од 7 починале од целебрален емболизам
1927 год., Egas Moniz – Прва целебрална ангио
1936 год., Sjoguist – прв случај со внатрешна каротидна оклузија со ангио
1942 год. , Hultquist – 1400 аутопсии, 3% инциденца на тромбоза


Miller Fisher

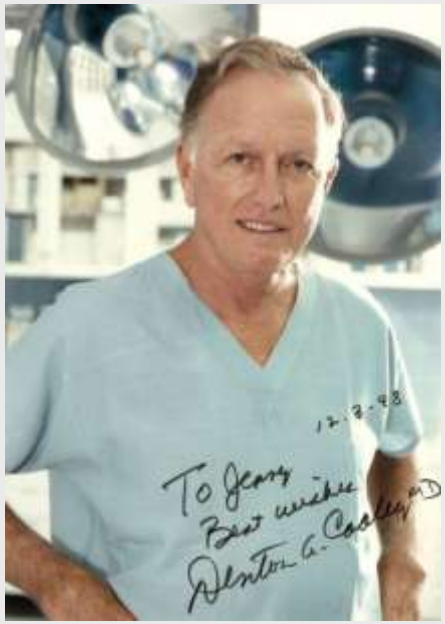
1951 год., C. Miller Fisher
Етиологија: Оклузија на каротидна артерија
8 ICA оклузии хемиплегија,
Проспективна изјава: “some day vascular surgery Neurosurgery will find a way to bypass the occluded portion of the internal carotid artery during the period of fleeting symptoms.”

Историја



1953 год., Michael DeBakey – Прва успешна каротидна ендартеректомија

Објавена 22 год. подоцна



1953, Denton Cooley – прв објавен извештај за ендартеректомија

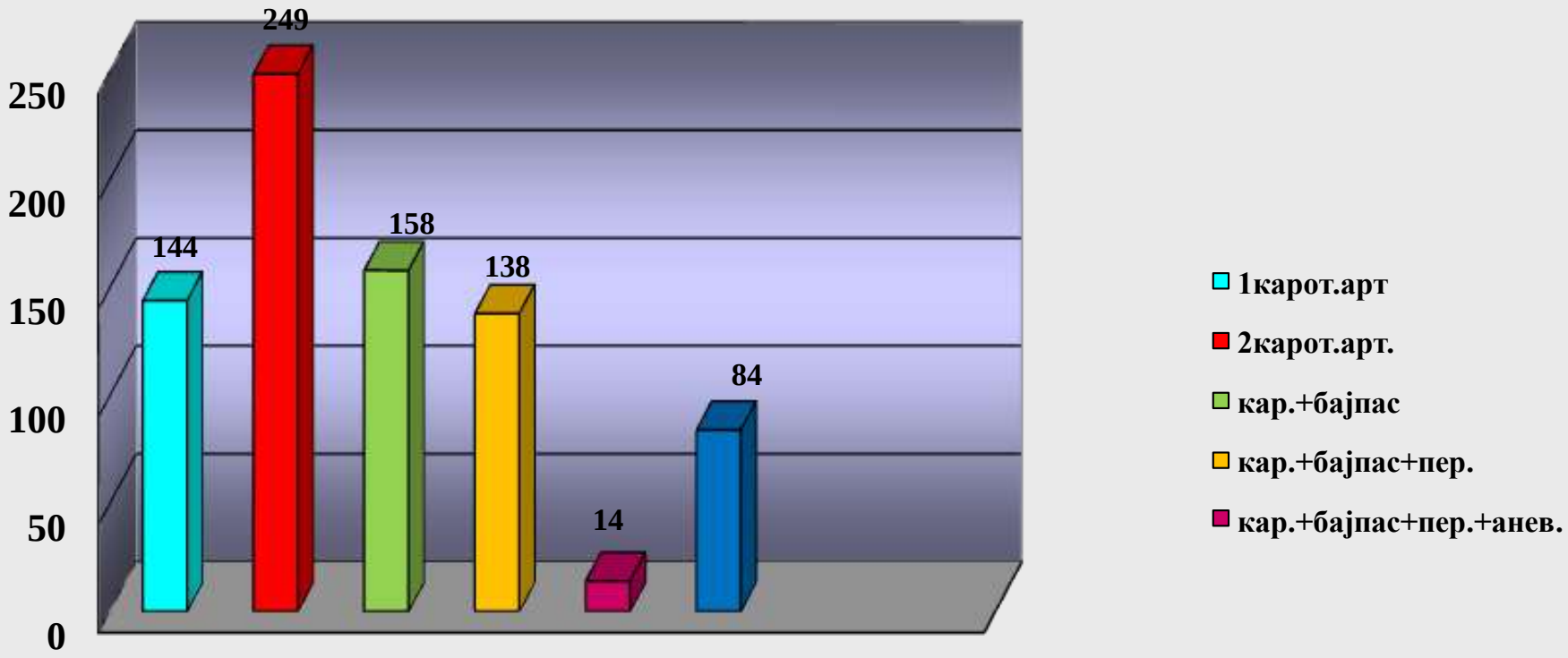
“I’ve always felt that I did well as a student because I lacked confidence.”

Епидемиологија

- Мозочен удар – трета водечка причина за смрт после кардиоваскуларни заболувања и канцер
-600,000 – 750,000 луѓе / годишно
- Водечна причина за возрасна хендикепираност
- Втора водечка причина за деменција.
90% од CVA и припаѓа на атеросклероза

Презентација
- Асимптоматски – 37%
- Хемисверна ТИА – 29% вклучувааат дисфазија/афазија, контралатерална пареза/ плегија, контралатерални сензорни промени, контралателарна хемианопсија
- Транзиторно монокуларно слепило– 9%
- Помали CVA – 24%

Васкуларна Хирургија N= 703 пациенти



Ризик фактори на атеросклероза

Фактори кои не зависат од нас

- Возраст
- Пол и раса
- Фамилијарна предиспозиција

Фактори кои може да ги контролираме:

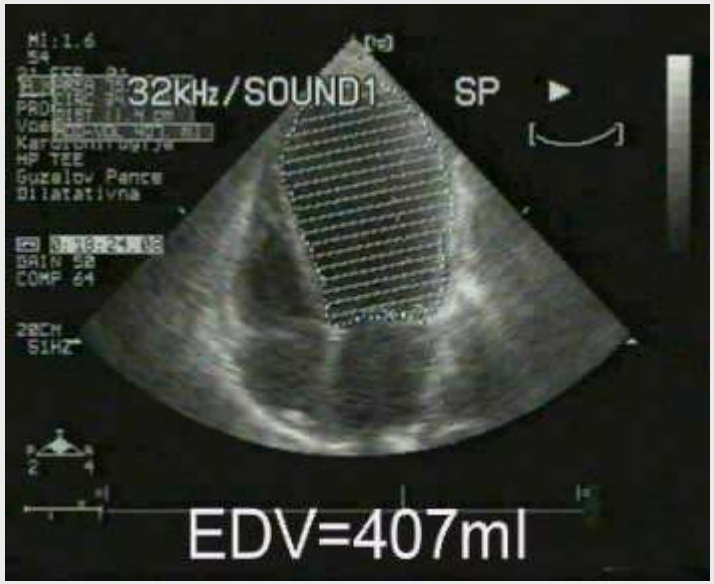
Хиперлипидемија (хол>5,6mmol/l)
Дијабетес (гликемија>7mmol/l)
Хипертензија сис.>140 и дијас.>90mmHg
Пушење
Седечки начин на живот, Тип А, стрес и дебелина.

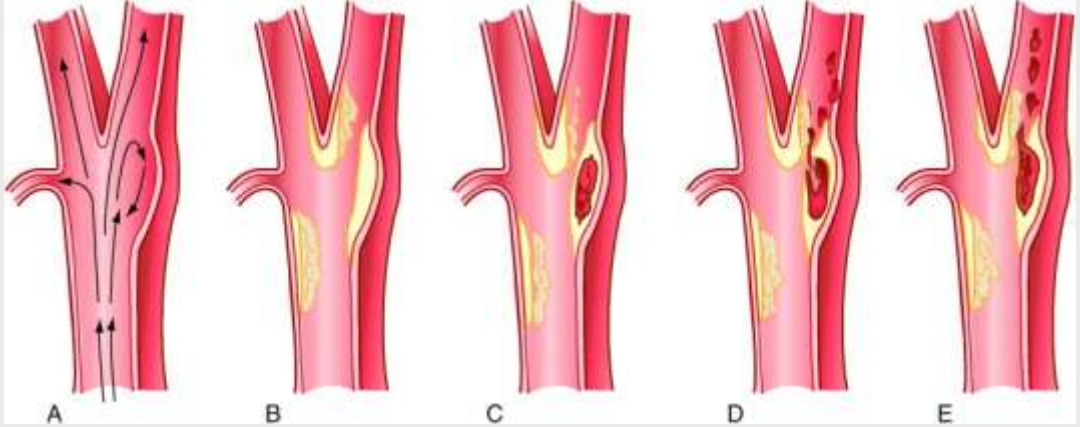
Извор:

- Кардијален

(AFF, мурални тромби после МИ, вентрикуларни аневризми, кардиоаритмија, простетични залистоци)

- Не кардијални (аортна/ абдоминална аневризма, улцери, претходна катетеризација)





Каротидна Стеноза

- **Етиологија –атеросклероза на бифуркација**

  а)низок sиден shear stress

  - проточна сепарација

  Комплексен реверзен проток низ задниот sид

- **Промени кои настануваат**

  а) формирање на плака

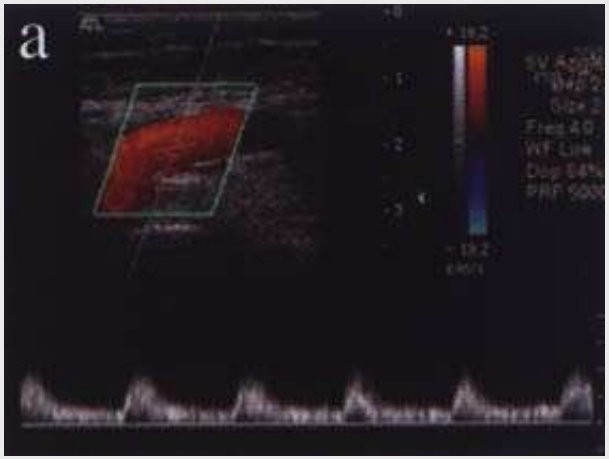
  б) централно некторично јадро со околна фиброза

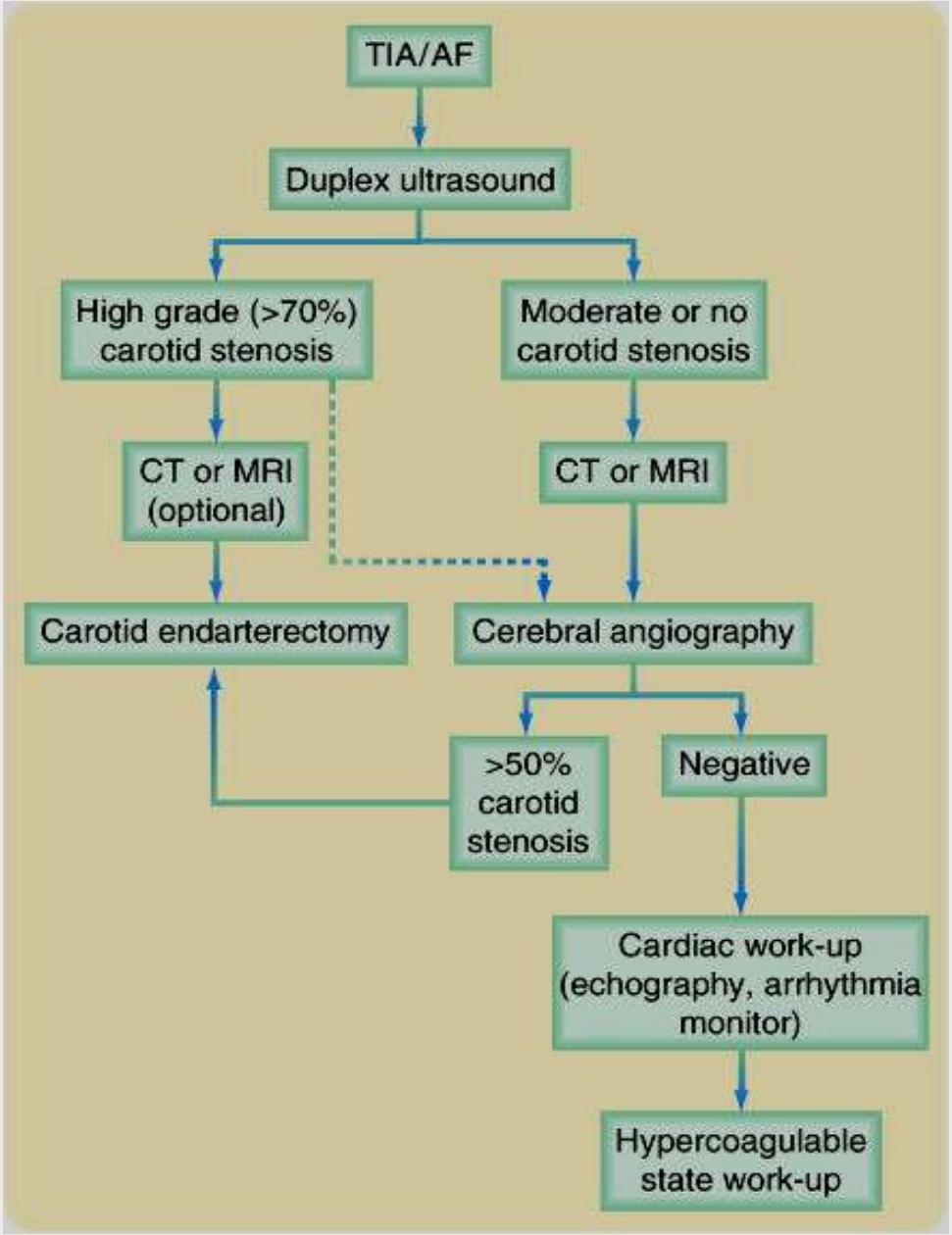
  d) дизрупција на околната фиброза – потенцијален емболус од некротичното ткиво, маснотиите.

  е)испразнетото некторотично јадно станува улцер – тромбоген потенцијал - тромбоемболизам

Клиника

- Асимптоматско зуење на ушите
- Амауроза – транзиторно мононуклеарно пореметување на видното поле
- латеризација - ТИА
- Крешчедно ТИА
- Мозочен удар во развој
- Цереброваскуларен акцидент

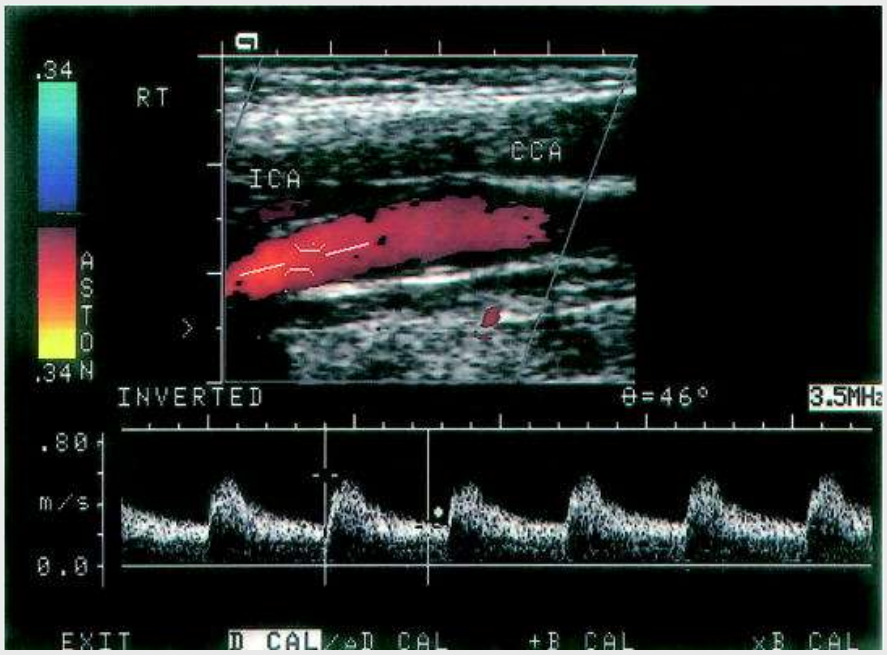


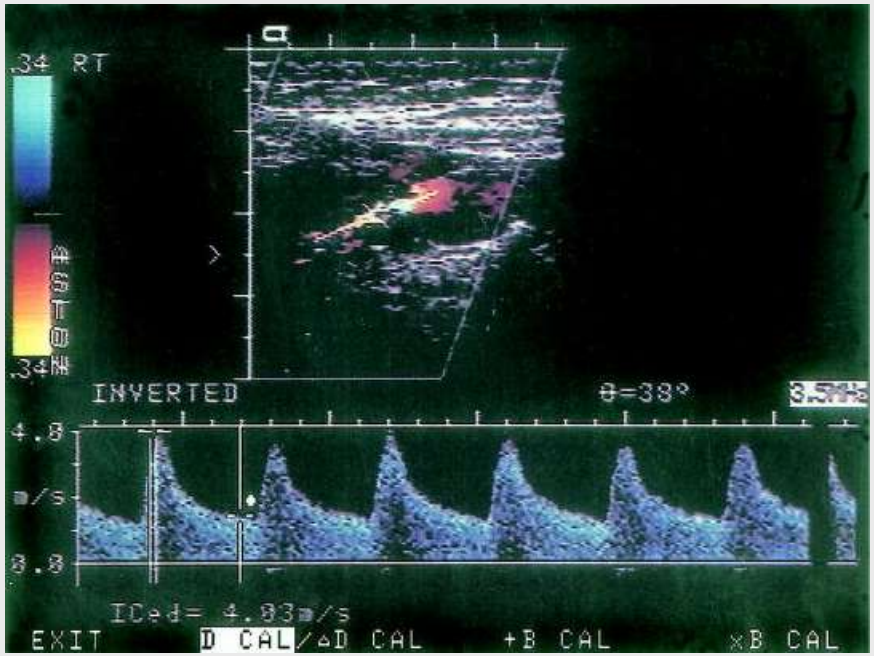


Дијагностички алгоритам

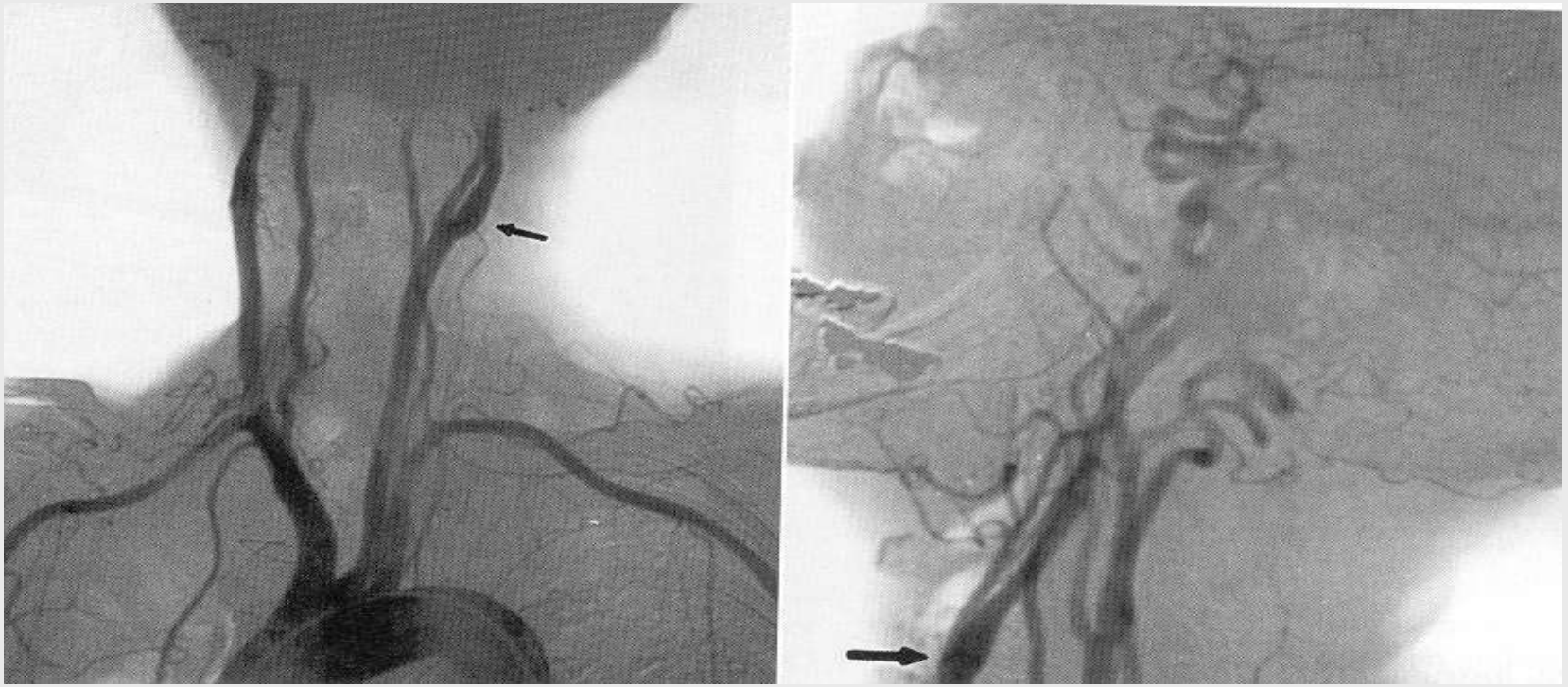
Duplex Scan

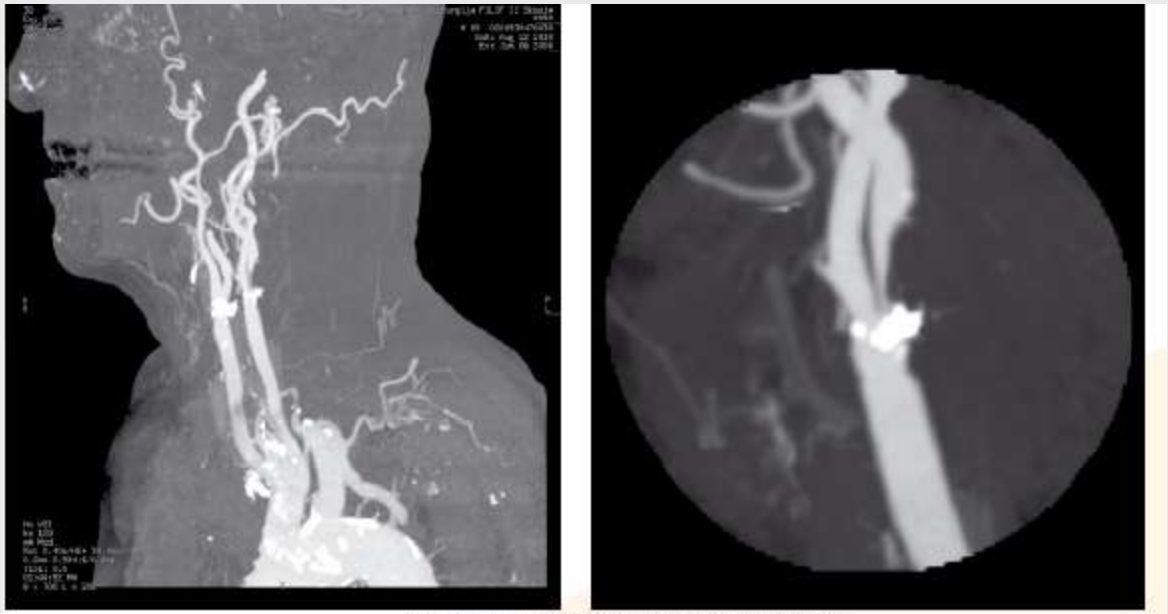
- B-mode scan – анатомски информации
- Doppler – брзина на проток





Дијагноза артериографија





КТ ангиографија (MIP) ангиоверзија

КТ ангиографија (VR) 3D колор верзија

64 МСКТ каротидна артерија

Индикација за хируршки третман

- Симптоматска ТИА, АФ, мал мозочен удар

  Докажана стеноза ≥ 70%

  Гранична стеноза 50-69%

  Лесна стеноза <50% - медикаментна терапија

- Асимптоматска

  Докажана стеноза ≥ 60%

- Терапевтска дилема?????????

  - Високо ризичен пациент
  - Комбинација на операција на каротиди и коронарна бајпас хирургија
  - Не стенотична улцеративна лезија

- Улцерација или контралатерална оклузија го одложува хируршкиот третман.

Конзервативен третман

- Регулација на тензија
- Престанок на пушење
- Нормализирање на липиден статус
- Губиток на телесна тежина
- Промена на начин на исхрана
- Регулирање на гликемијата

Третман

- После 6 часа промената е дефинитивна
- Се почнува со антикоагулантна терапија Тромболиза (доколку нема контраиндијација – акутно крварење, свеж мозочен удар, ГИ крварење, бременост, неконтролирана ХТА)
- Хирургија

  (ембролектомија/ тромбектомија) интраоперативна лиза

  Бајпас хирургија

Наши искуства

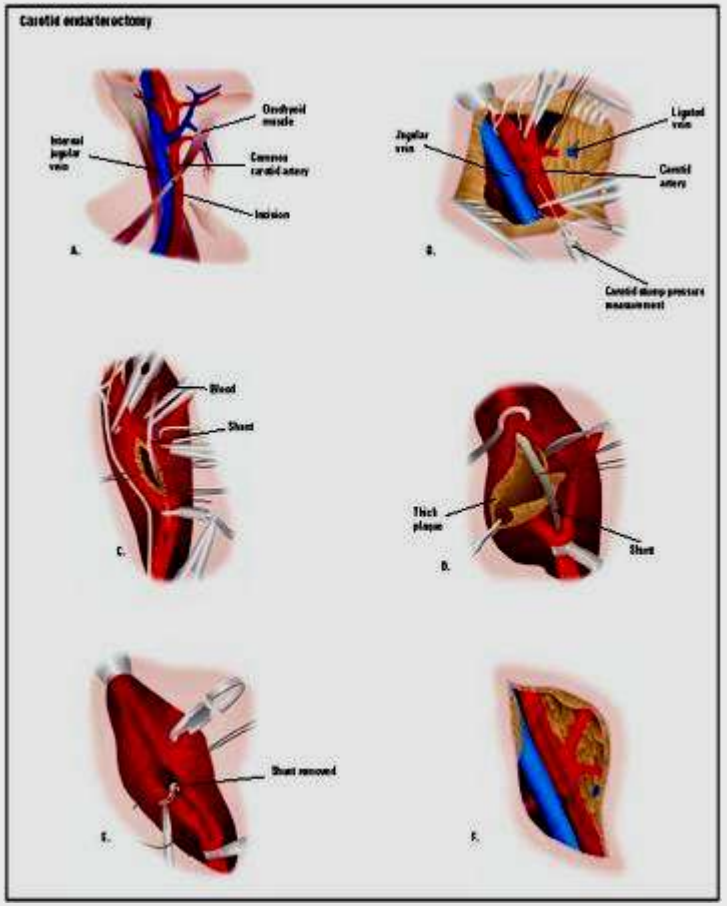
Стандард

Тромбендатеректомија
- invert техника
- patch техника

Општа длабока анестезија

Латерална надолжна инцизија на вратот

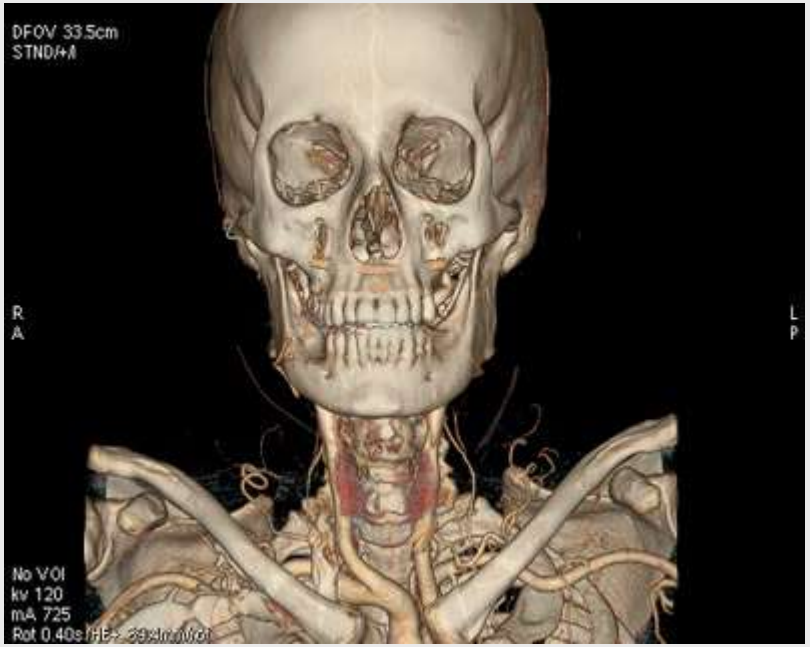
Шант



Минимално инвазивна каротидна хирургија – наша техника

Цели:

- Минимална инцизија(2cm)
- Без шант
- Брза и сигурна операција (минимално инвазивна)
-Идеално мониторирање на Церебрална функција
-Минимално инвазивна анестезија
-Рана мобилизација
-Најдобри долгорочни резултати



Минимално инвазивна каротидна хирургија
N = 84 пац.; период 12/09-05/10

Возраст (години) 62.2 ± 7.8

Пол (ж/м) 21/63

Коморбидитети:

Хиперлипидемиа- 53,5% (45пац.)
Коронарна артериска болест-51,2%(43пац.)
Дијабетес - 50%(42пац.)
Абдоминална аневризма 5,9% (5пац.)
Хипертензија – 55,9%(47пац.)
Периферна васкуларна болест 10,7%(9 пац.)
ХОББ – 17,8%(15pts)
Двете каротиди 34,5%(29пац.)
Обезност – 15,5%(13пац.)
Пушачи – 58,3%(49пац.)

Минимално инвазивна каротидна хирургија

Минимално инвазивна каротидна хирургија

Резултати- интраоперативни податоци N=84пац.

- **TEA** **69,0%(58пац.)**
- **Каротиден Кинкинг** **27,4%(23пац.)**
- **Екстранатомски бајпас** **1,2%(1 пац.)**
- **Венски графт** **2,4% (2 пац.)**

- **Просечно време на каротидно клемување** **13±0.8min**
- **Просечно време кожа до кожа** **30,7 ± 22.1min**
- **Интубација поради агитација** **5,9%(5пац.)**

Минимално инвазивна каротидна хирургија

Резултати N=84 пац.

- **Редон дренажа извадена по 4-6 h**
- **Болнички престој 1,5 денови 84 пац.**
- **Компликации –**

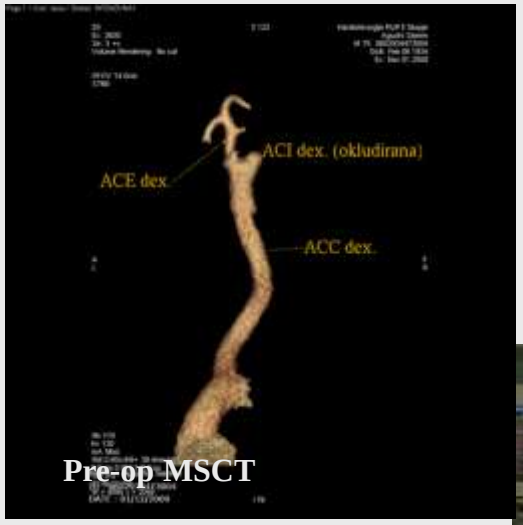
  рана постоперативна оклузија на каротида 1пац.
- **Транзиторни ефекти**

  - glosofaringealna пареза 2 пац.

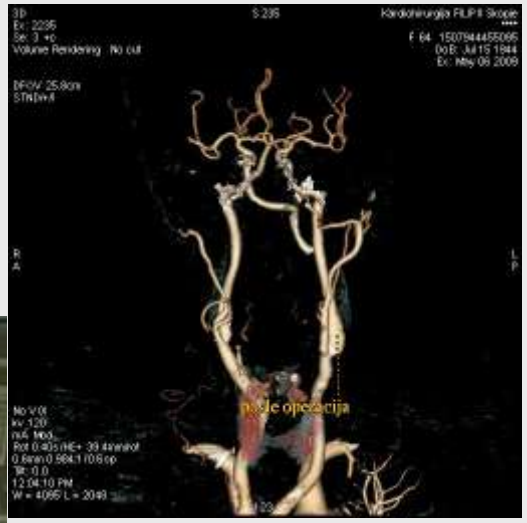
  -Фацијална пареза 1 пац.

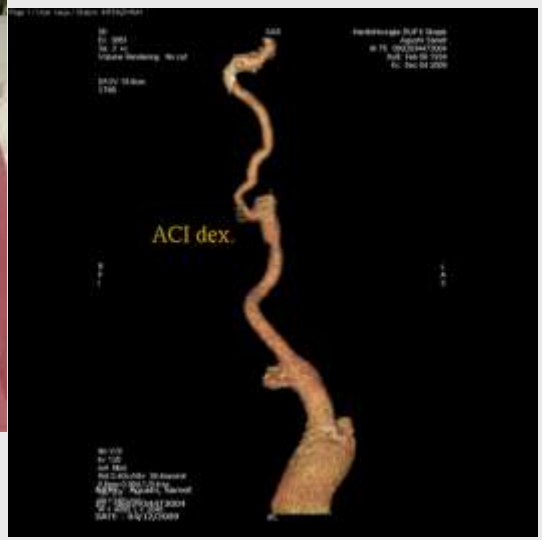
- **Период на следење 1-6 месеци.**

Минимално инвазивна каротидна хирургија
акутна каротидна оклузија

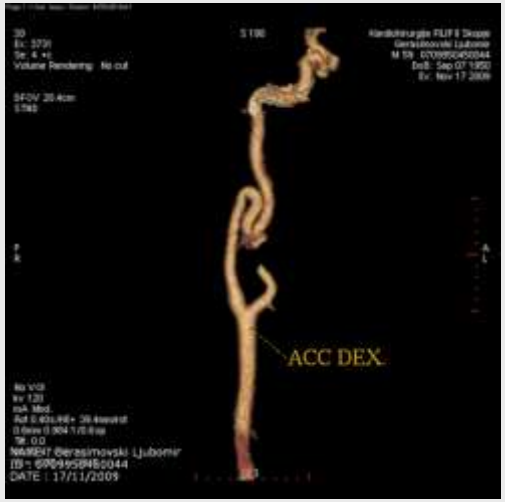


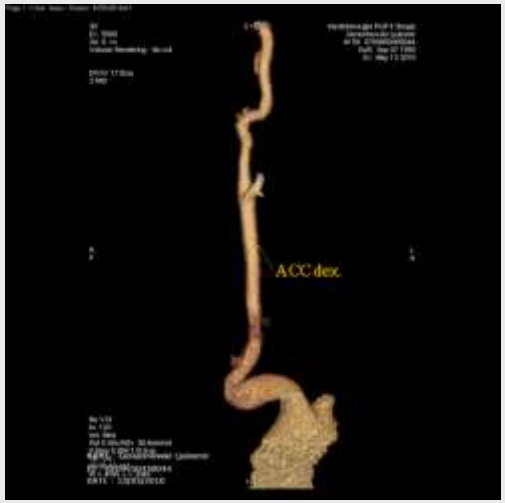
Прва операција во будни околности, после тромбендактомија, левострана плегија, говорни попреченост, и проблеми со голтање.



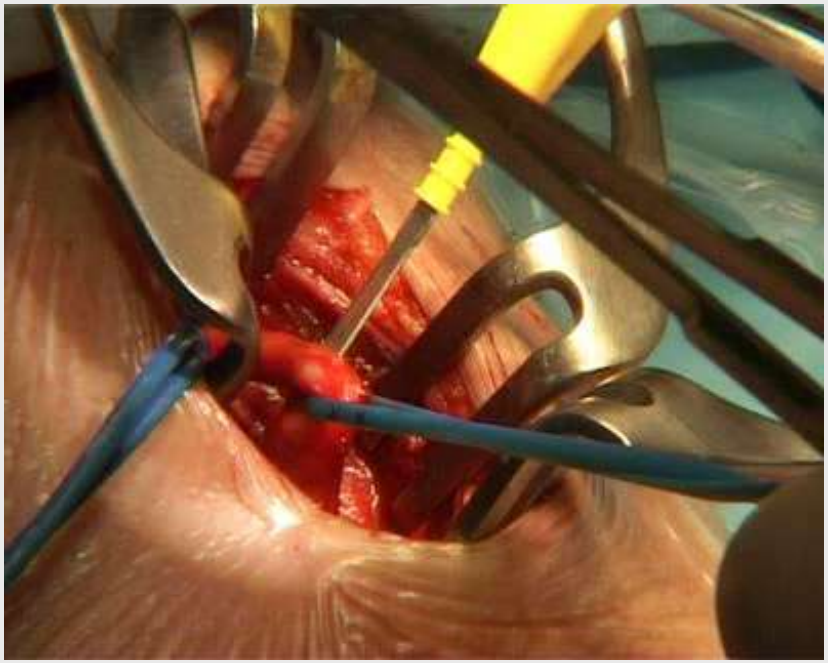


Минимално инвазивна каротидна хирургија
каротиден кинкинг

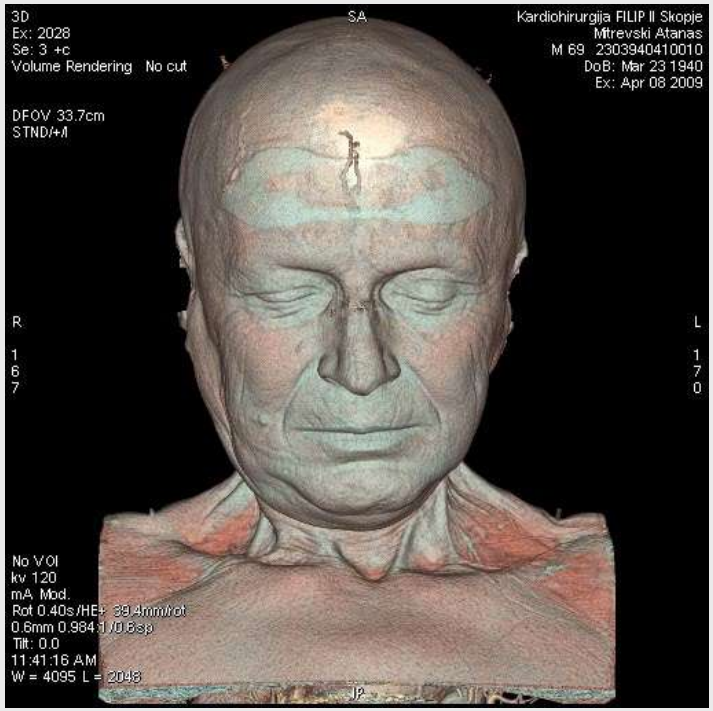


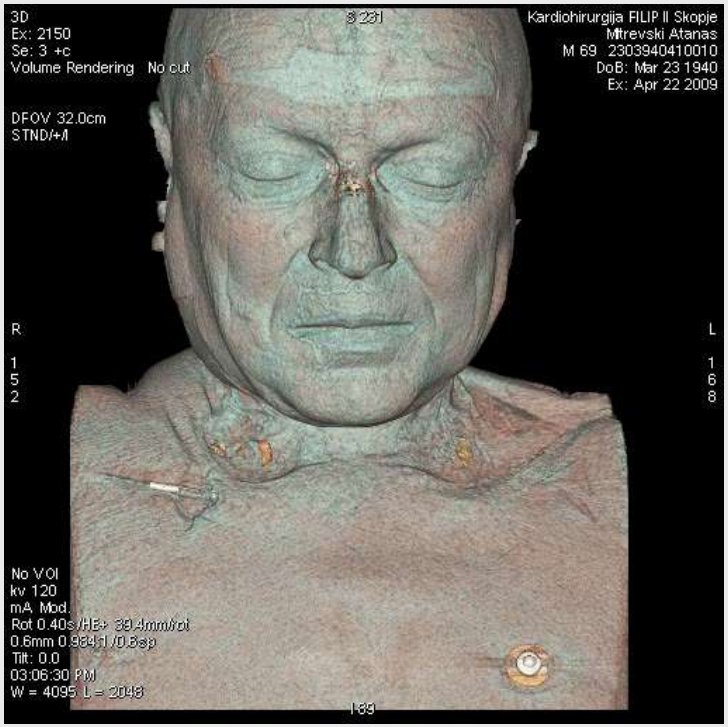


операција



Минимално инвазивна каротидна хирургија екстранатомски бајпас графтинг





Минимално инвазивна каротидна хирургија операција на каротидна аневризма

Т.В. 63 годишна пациентка
15 год. третирана од зголемена тиреоидна жлезда

Пред оп.

Пост оп.

Минимално инвазивна каротидна хирургија

Свеснот на пациентот во текот на операција им овозможува на анестезиолошкиот и хируршкиот тим најдобар невролошки мониторинг, веднаш прикажувајќи ги ефектите од cross-clamping и евентуална потреба од промена на анестезиолошките или хируршките постапки.

Подобар cost-benefit.

Минимално инвазивна каротидна хирургија
Иднина

Стент

•Брзо изводлива процедура

•Буден пациент

•↑ ризик од емболизам

•Каротидна аневризма

•Каротиден кинкинг

•↑ трошок на медицински третман (трошоци на клопидогрел)

• долгорочни резултати???

Хирургија

Брзо изводлива процедура

Буден пациент

↓ ризик од емболизам

Каротидна аневризма

Каротиден кинкинг

↓ трошок на медицински третман (аспирин)

Долгорочни резултати-Докажани

Заклучок

- Каротидни васкуларни заболувања преовладуваат во САД и резултираат со значаен морбидитет и морталитет ако не се третирани.
- Резултати од студии споредени со можностите на инвазивен третман се во тек и покажуваат конфликтни резултати.
- Студии ја подржуваат употребата на ангиопластика и стентирање на одредена популација на пациенти.

Заклучок

- Пациенти со каротидна стеноза кои очигледно би имале повеќе бенефит од каротидна ангиопластика и стентирање отколку од ЦЕА,се пациенти со сигнификатни коморбидитети кои имаат слаб хируршки потенцијал.
- Постари пациенти може да имаат повисок ризик од слаб мозочен удар во првите 30 дена после стентирање отколку после ЦЕА.
- Употребата на заштитни емболични филтри се важни за крајниот резултат после ангиопластика и стентирање.

Poor outcomes after endovascular treatment of symptomatic carotid stenosis: time for a moratorium

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DOI:10.1016/S1474-4422(09)70230-3

See Articles pages 898 and 908

The long-term outcomes of the CAVATAS trial, reported in the October issue of *The Lancet Neurology*,[1,2] add substantially to the published data from trials on the durability of endovascular treatment versus endarterectomy for symptomatic carotid stenosis.

Brown and colleagues should be congratulated for continuing to follow up patients for 10 years (median follow-up was 5 years). Such follow-up is vital to ascertain the effectiveness of procedures intended to reduce the long-term risk of stroke. Comparable data on outcomes beyond the immediate post-procedural period come from the SAPPHIRE,[3] EVA-3S,[4] and SPACE[5] trials, which had median follow-up periods of 3, 2, and 3·5 years, respectively, although the SAPPHIRE trial had substantial loss to follow-up.

Endovascular treatment in CAVATAS resulted in a three-fold greater incidence of severe restenosis during follow-up (hazard ratio 3·14, 95%CI 1·87–5·26; p<0·0001), with a higher risk of recurrent transient ischaemic attack and stroke in patients with restenosis and a non-significant higher long-term risk of non-perioperative stroke in the endovascular treatment arm overall (1·66, 0·99–2·80). The worse outcomes in the endovascular group were partly accounted for by the patients treated with angioplasty alone, and the results might not be entirely generalisable to current clinical practice. However, the SPACE trial, in which stenting was mandatory, also reported a higher incidence of 70% or more restenosis after endovascular treatment (11·1% vs 4·6%, p=0·0009).[5] Ongoing trials of carotid stenting must therefore follow-up patients in the long term to ascertain reliably the clinical consequences of these high rates of restenosis. In the large randomised trials of endarterectomy versus medical treatment alone for symptomatic carotid stenosis, nearly 20 000 patient-years of follow-up were available on the 3248 patients who underwent endarterectomy; therefore, the long-term durability of endarterectomy was reliably established.[6,7] CAVATAS, SAPPHIRE, EVA-3S, and SPACE together provide about 3500 patient-years of follow-up after endovascular treatment.

More worrying, however, is the increasingly consistent evidence of substantially higher procedural risks of stroke after endovascular treatment than after endarterectomy in patients with symptomatic carotid stenosis. The recently presented International Carotid Stenting Study (ICSS),[8] the largest trial of endarterectomy versus endovascular treatment to date, reported a nearly two-fold higher procedural risk of stroke in the endovascular treatment group—which is consistent with the results of meta-analysis of all previous randomised trials—and a five-fold excess of new infarcts seen on brain imaging. The initial result of the CAVATAS trial was an outlier in the previous meta-analyses of procedural risk; CAVATAS initially reported similar risks for endovascular treatment

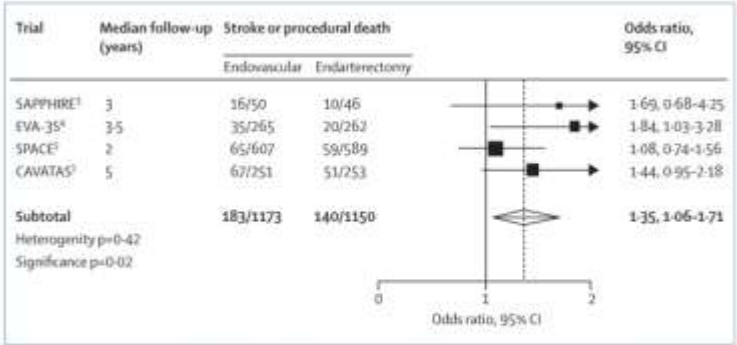

Figure: Meta-analysis of data on long-term risk of any stroke after randomisation and non-stroke periprocedural death from all published randomised trials of endovascular treatment versus endarterectomy for symptomatic carotid stenosis
The SAPPHIRE trial composite outcome also included periprocedural myocardial infarction and death and only ipsilateral ischaemic stroke at more than 30 days after the procedure.

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Surgical vs medical treatment for isolated internal carotid artery elongation with coiling or kinking in symptomatic patients: a prospective randomized clinical study.

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Abstract

BACKGROUND: Whether surgically correcting symptomatic carotid elongation with coiling or kinking in the absence of an atherosclerotic lesion of the carotid bifurcation (isolated elongation) is effective in preventing stroke remains a controversial issue. The hypothesis behind this study was that surgical correction of symptomatic isolated carotid elongation with coiling or kinking could yield better results, in terms of stroke prevention and freedom from late stroke or carotid occlusion, than medical treatment.

METHODS: We conducted a prospective clinical study randomly assigning symptomatic patients with isolated carotid elongation to undergo either elective surgery or medical treatment, with surgery reserved for any new onset or worsening of symptoms. The follow-up ranged from 1 month to 10 years (median, 5.9; mean, 6.2 years) and was obtained for all patients. The study end points were perioperative (30-day) stroke and mortality, late stroke, and stroke-related death and late carotid occlusions.

RESULTS: Ninety-two patients were randomly assigned for surgery and 90 for medical treatment. Overall, 139 carotid surgical corrections were performed in 129 patients. All 92 patients in the surgical arm had an elective operation; 10 of these patients later developed symptoms on the opposite side (7 hemispheric and 3 retinal transient ischemic attacks) and had contralateral internal carotid artery surgery. An additional 37 patients (41.1%) randomly assigned to medical treatment crossed over to the surgical group within a mean of 16.8 months after randomization due to new hemispheric symptoms or worsening nonhemispheric complaints. There were no perioperative strokes or deaths. The incidence of late hemispheric and retinal transient ischemic attacks was significantly lower in the surgical than in the medical group, respectively, 7.6% (7 of 92) vs 21.1% (19 of 90) (P = .01) and 3.2% (3 of 92) vs 12.2% (11 of 90) (P = .03). Late strokes, 2 (2.2%) of which were fatal, occurred only in the medical group (6 of 90, 6.6%; P = .01). Late carotid occlusions also developed only in the medical group (5 of 90, 5.5%; P = .02). All surgically treated carotid elongations were analyzed histologically and 78 (56.%) of 139 showed atypical and typical patterns of fibromuscular dysplasia.

CONCLUSIONS: The overall results of this trial indicate that surgical correction of symptomatic isolated carotid elongations with coiling or kinking is better for stroke prevention than medical treatment.

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Results in a consecutive series of 83 surgical corrections of symptomatic stenotic kinking of the internal carotid artery.

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Abstract

BACKGROUND: Although there is a growing body of evidence to document the safety and efficacy of operative treatment of carotid stenosis, surgical indications for elongation and kinking of the internal carotid artery remain controversial. The goal of this study was to evaluate the efficacy of surgical correction of internal carotid artery kinking in patients with persistent hemispheric symptoms despite antiplatelet therapy.

METHODS: A consecutive series of 81 patients (mean age, 64 years) underwent 83 surgical procedures to correct kinking of the internal carotid artery either by shortening and reimplanting the vessel on the common carotid artery, inserting a bypass graft, or transposing the vessel onto the external carotid artery. Mean follow-up was 56 months (range, 15-135 months). Study endpoints were 30-day mortality and any stroke occurring during follow-up.

RESULTS: No postoperative death was observed. The postoperative stroke rate was 1%. Primary patency, freedom from neurologic symptoms, and late survival at 5 years (x +/- standard deviation) were 89 +/- 4.1%, 92 +/- 4%, and 71 +/- 6%, respectively.

CONCLUSIONS: The findings of this study indicate that surgical correction for symptomatic stenotic kinking of the internal carotid artery is safe and effective in relieving symptoms and preventing stroke. Operative correction should be considered as the standard treatment for patients with symptomatic carotid kinking that does not respond to antiplatelet therapy.

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Rationale of the surgical treatment of carotid kinking.

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Abstract

AIM: Elongation and tortuosity of the internal carotid artery (ICAET) is a common angiographic, angioMR or Duplex scanning finding: it can be "pure" and, in a great majority of cases, it is not correlated to neurological symptoms. It can be associated with atherosclerotic bifurcation plaque, therefore in this case, indications to surgery follow that of carotid stenosis. On the other hand in some patients ICAET seems potentially correlated to hemispheric or non hemispheric symptoms: ICAET may show as kinking with a wide or narrow acute angle, single (< shaped) or double (Z shaped), or less frequently as a coiling (S,U, or C shaped). Surgical indications are controversial. In the author's opinion, surgery may represent the safest tool in the prevention of a stroke due to carotid occlusion, in selected patients. The aim of this study is to describe the author's experience in the surgical treatment of carotid kinking not associated with significant atherosclerotic lesions.

METHODS: From March 1994 to March 2001, 29 patients (11 male, 18 female) with a pure ICAET underwent surgery. Patients presented hemispheric symptoms (24.13%), non hemispheric symptoms (41.3%) or both (27.5 %). Two asymptomatic patients (6.9%) underwent surgery because of contralateral carotid occlusion.

RESULTS: The postoperative (within 30 days from operation) results, no mortality was observed, 1 patient presented a stroke (3.4%), and 1 patient had a TIA at awakening (negative cerebral CT scan). All patients with hemispheric symptoms (15 patients) had complete remission, whereas only 6 out of 12 patients (50%) presenting non-hemispheric symptoms had remission (1 patient underwent a controlateral ICAET correction).

CONCLUSIONS: The natural history of symptomatic and asymptomatic ICAET is practically unknown, but in some cases selected indication to surgery is justified. Surgery was indicated for patients with transient ischaemic attacks (hemispheric symptoms); in asymptomatic patients presenting a kinking with an angle inferior to 30 degrees, and a contralateral carotid artery occlusion; in patients with non hemispheric symptoms, after a screening to exclude all other possible neurological or non-neurological causes with duplex scan positive for significant increase of flow velocity in ICA and positive cerebral CT scan or MR scan for ischaemic lesions in the homolateral hemisphere, and/or a flow inversion in anterior cerebral artery or flow reduction in the middle cerebral artery, according to different head positions (rotation and flex-extension).

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The elongation of the internal carotid artery: early and long-term results of patients having surgery compared with unoperated controls.

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Abstract

The purposes of this study are to (1) demonstrate the association of elongations of the internal carotid artery (ICA), that is, kinking, coiling, tortuousity, and angulation, and the neurologic symptoms with high stroke risk; (2) compare the results of the surgical treatment versus the medical treatment alone; (3) contribute to the knowledge of the natural history of these anatomical particularities. From January 1992 to December 1994, 113 patients with ICA kinking, coiling, tortuousity, and angulation were randomized either to surgery (group I, n = 55) or not (group II, n = 58). Patients, who presented a carotid hemodynamically significant lesion (>60%) at the origin and associated distal elongation were excluded. The groups were comparable with regard to sex, age, risk factors for atherosclerosis, associated diseases, symptoms and anatomic feature of the contralateral ICA. Follow-up was obtained in all patients: it consisted of clinical evaluation and Duplex scan control at 3-month intervals during the follow-up period (6-36 months; average, 23). Histologic specimens were obtained in all surgically treated arteries. Early results were excellent: in group I, no patient died, no patient presented major or minor stroke. Only one patient had an immediate transient ischemic attack (TIA) which spontaneously recovered within 24 hours. All symptomatic patients examined the complete disappearance of clinical signs. There were no late deaths due to stroke and no late major or minor neurologic deficit occurred. All reconstructed ICAs were patent. In group II, three patients experienced a major stroke with hemiplegia due to ICA occlusion. Most of the symptomatic patients (37) of group II remained stable, while seven of them had worsening of symptoms and were referred for surgery. To conclude, all surgically treated patients had the complete relief of preoperative neurologic symptoms; none of the medically treated patients had an improvement. Although there was no statistically significant difference between the two groups with regard to stroke risk, three medically treated patients progressed to total occlusion. This suggests that kinking, coiling, tortuousity, and angulations of the ICA are not merely an anatomic curiosity but a potentially disabling, even fatal condition.

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Stenotic coiling and kinking of the internal carotid artery.

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Abstract

Between January 1979 and December 1991, 174 of a total of 2304 carotid reconstructions (7.5%) were performed in 166 patients for stenotic coiling or kinking of the internal carotid artery. There was a 1.4 male predominance and the mean age of the patients was 66.3 +/- 9.6 years (range 38 to 91 years). Seventeen patients (9.8%) were asymptomatic, 54 (31%) were symptomatic because of a previous stroke, and 103 (59.2%) had had transient ischemic attacks. The symptoms were hemispheric in 108 (62.1%) cases, ocular in 19 (10.9%), and vertebrobasilar in 30 (17.2%). The stenotic coiling or kinking was isolated in 35 (20.1%) cases and associated with other lesions of the internal carotid artery in 139 (79.9%). These included 119 atherosclerotic stenoses, 14 aneurysms, and six stenotic lesions due to fibromuscular dysplasia. Angioplasty of the carotid bifurcation was performed in 102 (58.6%) patients, associated with endarterectomy in 84 (48.3%) cases and with dilatation of dysplastic lesions in six (3.5%) cases. A bypass graft and resection and anastomosis of the carotid artery were performed in 36 (20.7%) patients each. There were four postoperative deaths (2.3%): two were due to neurologic causes, one to heart disease, and one to complications of an associated surgical procedure. Five patients (2.9%) had postoperative strokes and eight (4.6%) had transient ischemic attacks. At postoperative follow-up investigations four (2.3%) patients had carotid occlusions and 10 (5.7%) had morphologic abnormalities. At 5 years, actuarial survival was 80.97 +/- 8.8%, patency was 96.12 +/- 2.95%, and the ipsilateral stroke-free rate was 93.12 +/- 4.49%. Treatment of stenotic coiling or kinking of the internal carotid artery yields satisfactory results, comparable to those of endarterectomy, for isolated atherosclerotic carotid stenoses and is effective in the prevention of ipsilateral ischemic stroke.

PMID: 8123455 [PubMed - indexed for MEDLINE]