TRAUMATIC ABDOMINAL WALL HERNIA- A CASE REPORT

Nikolina Mihajlova¹, Violeta Hristova Janik², Vesna Petreska-Dukovska³, Vlatko Cvetanovski³, Aleksandar Mitevski³

¹Resident of surgery at Faculty of Medical Science, Goce Delcev University in Stip, North Macedonia, ²Endoscopy department, Re-Medica, General hospital Skopje,

³Department of Surgery, Re-Medica General Hospital, Faculty of Medical Sciences, Goce Delchev University in Stip, North Macedonia

Abstract

Traumatic abdominal wall hernia remains a rarely reported event, despite the high prevalence of blunt abdominal trauma. The traumatic abdominal wall hernia was successfully managed by Intra peritoneal On lay Mesh technique, a repair procedure where a mesh is introduced into the abdominal cavity and placed from the inside over the hernia opening.

Case report

We report a rare case of traumatic abdominal wall hernia caused by a traffic accident. A 33year-old male was hospitalized after road traffic accident. He sustained facial and rib fractures and received emergency treatment and was presumably discharged after reasonable recovery. He attended our clinic two years later with complaints of pain and swelling in the left subcostal area. Computed tomography showed an abdominal wall defect.

Type of abdominal wall, the size of the hernia defect and the presence of associated intraabdominal injuries are main factors to decide how the hernia will be repaired, immediate versus delayed. IPOM plus technique is used in an elective treatment of traumatic abdominal wall hernias.

Studies show that seroma formation was less often found in patients undergoing laparoscopic intra peritoneal on lay mesh treatment with fascial defect closure as compared to laparoscopic intra peritoneal on lay mesh placement without defect closure.

Traumatic abdominal wall hernia presents a diagnostic as well as a therapeutic challenge. The therapeutic approach is governed by a multitude of factors emphasizing the need of a patient-tailored, case by case management plan.

Keywords: trauma, hernia, IPOM, hernioplasty, mesh

Introduction

Traumatic abdominal wall hernia (TAWH) remains a rarely reported event, despite the high prevalence of blunt abdominal trauma. A review of English literature on this subject showed approximately 50 reported cases since the first report in 1906 [1].

TAWHs are generally categorized into three major types: (A) a small abdominal wall defect caused by low-energy trauma with small instruments, e.g., bicycle handlebars, (B) a larger abdominal wall defect caused by high-energy injuries, and (C) rarely, intraabdominal herniation of the bowel caused by deceleration injuries.

In 2009, the European Hernia Society divided lateral hernia into four zones: L1 (subcostal), L2 (flank), L3 (iliac), and L4 (lumbar) [2].

The TAWH was successfully managed by IPOM (Intra peritoneal On lay Mesh) and IPOM plus (Intraperitoneal Onlay Mesh reinforcement with defect closure before mesh placement) technique, a repair procedure where a mesh is introduced into the abdominal cavity and placed from the inside over the hernia opening [3].

The aim of the presented paper is to give accent abdominal wall trauma and traumatic hernia as not so rare occurrence in general surgery.

Case report

We report a rare case of traumatic abdominal wall hernia (TAWH) caused by a traffic accident. A 33-year-old male was hospitalized after road traffic accident. He sustained facial and rib fractures on the left side, he received emergency treatment and was presumably discharged after reasonable recovery. He attended our clinic two years later with complaints of pain and swelling in the left subcostal area (EHS L1/W2). Computed tomography (CT) showed an abdominal wall defect in the left subcostal area, intra parietal defect with transversal and internal abdominal muscles defect and external abdominal muscle distorted but present, also with herniation of omentum.



Figure 1. Preoperative abdominal computed tomography of axial view



Figure 2. Preoperative abdominal computed tomography of coronal view

After the pre-operative preparations, the patient was operated under general anesthesia. The patient was in the supine position. Pneumoperitoneum at 12 mm Hg was established using an "open technique". The first 10–12 mm trocar was inserted supraumbilical and two working troacars were

placed under vision, the first one of 5 mm at the level of xyphoid processus and the second of 5 mm near the paraumbilical line 3 cm infraumbilical on the left side.



Figure 3. Intraoperative presentation of left subcostal abdominal wall hernia

Adhesions were grasped, and adhesiolysis was carried out, preferably with cold scissors, to clear the margins of the defect and to avoid bowel injury.

After adhesiolysis was performed, a reduction of hernia contents was started with the steady hand-over-hand withdrawal of the sac contents.

The defect size was measured for each side ($\approx 9x8$ cm), and then the prosthetic mesh was tailored to ensure at least a 5 cm overlap of all defect margins. Hernia defect was closed with O polydioxanone barbed suture before the mesh placement.



Figure 4. Measuring the defect before suture and mesh placement (\approx 9x8 cm)

Checking of hemostasis which is exact and place the composite intraperitoneal mesh 20x25 cm. During hernia closure and mesh fixation, the pneumoperitoneum pressure was always reduced to 8 mm Hg.

Tacking devices were used for mesh fixation with the double-crown technique, and fixation in the upper part near diaphragm with suture. One intraperitoneal drain placed and operative wounds closed in layers.



Figure 5. A (Closing hernia defect with suture)



Figure 5.B (Placement of composite intra peritoneal mesh 20x25cm)

Discussion

Traumatic abdominal wall hernia (TAWH) is a rarely described type of hernia, resulting from blunt trauma to the abdomen. It is defined as bowel or abdominal organ herniation through a disruption of the musculature and fascia following adequate trauma, with no evidence of skin penetration or preexisting hernia [4]. We did not use AWI (abdominal wall injury score) as it was delayed presentation [5].

This type of abdominal wall hernia was first described by Shelby more than 100 years ago, with around 250 cases reported in medical literature. CT scanning is the most accurate diagnostic tool for TAWH and should be used for detection of associated intraabdominal injury.

If the TAWH is associated with intra-abdominal lesions needing exploratory laparotomy, the abdominal wall defect would most accurately be assessed intra-operatively. In cases with delayed presentation, CT and magnetic resonance imaging of the abdominal wall can accurately evaluate these defect [6].

In case the trauma patient is stable and the size of the hernia is small, with the visceral organs protruding through the defect, exploratory laparotomy/laparoscopy should be performed on an urgent basis to prevent possible visceral incarceration.

There are some surgical approaches for the repair of TAWHs. Debate still remains as to whether midline exploratory laparotomy is needed to rule out intra-abdominal injuries. Local exploration

through an incision overlying the defect may be an option for small defects caused by low velocity injury, but TAWHs following high-energy trauma should undergo exploratory laparotomy through a midline incision owing to a high prevalence of associated intraabdominal injuries.

Diagnostic laparoscopy seems to be an excellent adjunct in the management of TAWHs. In the event of a negative diagnostic laparoscopy, one can repair the hernia by the local approach and avoid unnecessary general abdominal exploration [7].

There are also controversies regarding the timing of exploration: immediate versus delayed exploration. Delayed exploration, as well as delays in diagnosis, can lead to some problems such as a bowel strangulation and excessive tension in the primary closure of the defect. Some authors have suggested that reconstruction of the abdominal wall defect can be delayed and repaired on an elective basis, especially in the focal type TAWH. Immediate exploration and repair, however, has generally been accepted as a more favorable choice in the treatment of TAWH. In our case we have made repaired on an elective basis and used IPOM plus technique.

In some studies we found that seroma formation was less in patients undergoing laparoscopic IPOM with fascial defect closure as compared to laparoscopic IPOM without defect closure. Similarly, recurrence at the 1-year follow-up was also found to be lower in laparoscopic IPOM with fascial defect closure [8].

Conclusion

In conclusion, traumatic abdominal wall hernia presents a diagnostic as well as a therapeutic challenge. With its subtle presentation, a high index of clinical suspicion is needed to reach the diagnosis that is particularly facilitated by the routine use of CT scanning in the trauma setting.

As outlined above, the therapeutic approach is governed by a multitude of factors emphasizing the need of a patient-tailored, case by case management plan.

References:

- Dennis RW, Marshall A, Deshmukh H, et al. Abdominal wall injuries occurring after blunt trauma: incidence and grading system. Am J Surg 2009;197(3):413–417. DOI: 10.1016/j.amjsurg.2008.11.015
- 2. Muysoms FE, Miserez M, Berrevoet F, et al. Classification of primary and incisional abdominal wall hernias. Hernia 2009;13:407–14.
- 3. Novitsky YW. Laparoscopic repair of traumatic flank hernias. Hernia 2018;22:363–9.
- 4. Damschen D.D., Landercasper J., Cogbill T.H., Stolee R.T. Acute traumatic abdominal hernia: case reports. J. Trauma. 1994;36:273–276. doi: 10.1097/00005373-199402000-00026.
- Dennis RW, Marshall A, Deshmukh H, et al. Abdominal wall injuries occurring after blunt trauma: incidence and grading system. Am J Surg 2009;197(3):413–417. DOI: 10.1016/j.amjsurg.2008.11.015
- Yadav S., Jain S.K., Arora J.K., Sharma P., Sharma A., Bhanwan J. Traumaic abdominal wall hernia delayed repair: advantageous or taxing. Int. J. Surg. Case Rep. 2013;4:36–39. doi: 10.1016/j.ijscr.2012.10.004.
- 7. Brunicardi, F. Charles. Schwartzs Principles Of Surgery, 11th edition. 2019.
- Laura Cebolla-Rojas, Carlos Morales-García, Melanie Morote-González, Cristina Rey-Valcárcel, María Dolores Pérez-Díaz, M Mercedes Sanz-Sánchez, Fernando Turégano-Fuentes.Massive Traumatic Abdominal Wall Hernia: A Very Rare and Potentially Serious Injury: Analysis of a Short Case Series.Panamerican Journal of Trauma, Critical Care &Emergency Surgery. Volume 13 | Issue 2 | Year 2024. https://doi.org/10.5005/jp-journals-10030-1453.

Mihajlova N. et all. Traumatic abdominal wall hernia -a case report