



Post-traumatic lateral abdominal wall hernia: a case report

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Introduction and importance: Traumatic abdominal wall hernia (TAWH) also known as blunt abdominal TAWH is uncommon. The clinical diagnosis is difficult. The authors present a case report of posthigh-energy abdominal blunt trauma causing a TAWH.

Case presentation: A 36-year-old woman, with unremarkable past medical history, was presented to the Emergency Department after a stuck in high-speed two automobiles. She was hemodynamic, respiratory, and neurologically stable. The BMI was 36 kg/m². The abdomen was not distended with an ecchymotic lesion on the right flank. The thoracic abdominal and pelvic computed tomography (CT) scan revealed a rupture in the lateral abdominal wall muscles with a TAWH in the location of the skin ecchymoses. There was no visceral lesion or intraperitoneal fluid. A conservative treatment was indicated. The follow-up was uneventful, with hematoma resorption and no cellulitis or abscess. The patient was discharged after 1 week. An abdominal repair will be planned using a mesh.

Clinical discussion: TAWH is a rare entity. The best imaging modality for diagnosis is the CT scan allowing classification of the hernia and a screen for other injuries. The presence of an isolated TAWH must lower the threshold to closely monitor or to operatively explore, given the high rate of false-negative findings at imaging features.

Conclusion: TAWH should be suspected behind any blunt abdominal trauma with high energy. CT scan and ultrasound were helpful for diagnosis and the only curative treatment is surgery to avoid complications.

Keywords: case report, computed tomography scan, hernia, trauma, traumatic abdominal wall hernia

Introduction

Blunt abdominal trauma continues to be a frequent cause of emergency department visits^[1]. It is strongly associated with high-energy injuries. They occur frequently after vehicle or automobile accidents of high energy^[2]. An isolated traumatic abdominal wall hernia (TAWH) also known as blunt abdominal TAWH is uncommon. It was first described in 1906^[3] and defined as the ‘herniation through disrupted musculature and fascia, associated with adequate trauma, without skin penetration and no evidence of a prior hernia defect at the site of injury’. Its incidence is less than 1% of all abdominal blunt trauma^[1,4,5]. All patients with varying degrees of abdominal tenderness with either abdominal wall skin abrasions or ecchymosis could make

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HIGHLIGHTS

- Traumatic abdominal wall hernia is a rare entity frequently misdiagnosed.
- Computed tomography scan is the most performant imaging feature to make diagnose, classify the hernia, redress associated lesions, and indicate the therapeutic strategy.
- This condition presents a therapeutic challenge regarding the delay of surgery and the use of mesh.

easy misdiagnosed TAWH because the abdominal examination is difficult. In most cases, a computed tomography (CT) scan confirmed the abdominal wall lesions and assessed the associated injuries that could require surgery. We present a case report, according to SCARE guidelines^[6], of posthigh-energy abdominal blunt trauma causing a TAWH.

Case presentation

A 36-year-old woman, with unremarkable past medical history, was presented to the Emergency Department after a stuck in high-speed two automobiles. On arrival, she was hemodynamic, respiratory, and neurologically stable. She was assessed along the lines of Advanced Trauma Life Support protocol. The BMI was 36 kg/m². She presented upon assessment the following positive signs: tenderness of the right side of the chest, a clinical seat belt sign, and abdominal distension with tenderness in the lower right quadrant. We noted an ecchymotic lesion of 15 × 20 cm on the

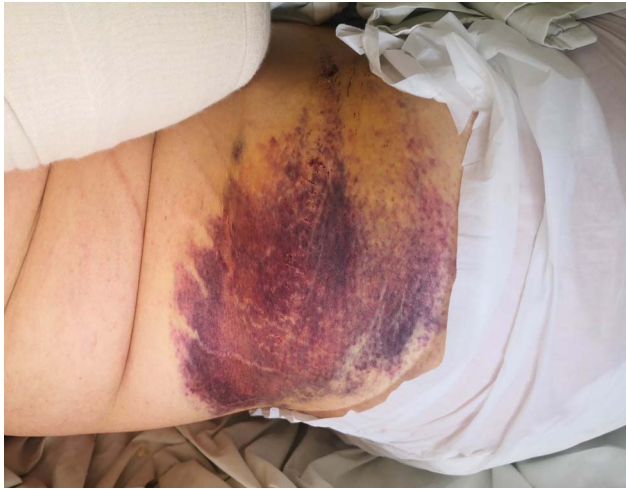


Figure 1. Patient picture showing the ecchymotic lesion in the right flank, 2 days after the accident.

right flank (Fig. 1). Radiographic imaging was positive with right rib and right arm fractures. The thoracic abdominal and pelvic CT scan revealed a large defect in the lateral abdominal wall muscles with a hematoma associated with a subcutaneous visceral herniation in the location of the skin ecchymoses (Fig. 2). There were no liver or spleen lesions. There is no intraperitoneal fluid or free peritoneal air. Regarding these findings and the stable hemodynamic parameters, the patient was admitted to the ICU and symptomatic treatment was indicated. The follow-up was uneventful, with hematoma resorption and no cellulitis or abscess. The outline management was discussed with the patient. A laparoscopic repair will be planned with mesh after a weight reduction.

Discussion

This observation reported a case of posthigh-energy abdominal blunt trauma causing a TAWH with no associated intra-abdominal lesions which present a rare entity in the area of blunt abdominal trauma.

Traumatic abdominal wall injuries are a broad clinical and radiological spectrum. They present ~9% of blunt trauma patients^[7]. TAWH is a specific rare entity that could have specific attention^[7]. Certainly, this entity is multifactorial but we noted that about 75% of patients were obese or overweight and an increased BMI predictive factor for a TAWH^[11]. The diagnosis is easy to miss clinically and it is typically straightforward on a CT scan^[8]. Bjork *et al.*^[9] discussed the use of abdominal ultrasound (US). However, we do not recommend it due to the high levels of false negatives, particularly in obese patients like in our case. Associated injuries may distract the interpreting radiologist^[10]. Thus, the radiologist needs to identify abdominal wall injuries and their associated lesions, to not pass the time of an eventual emergent surgery, especially after TAWH present itself as an important predictor of associated intra-abdominal lesions. Furthermore, we suggest, in institutions or countries where logistic or financial obstacles do not permit universal CT scans in trauma, specific use of CT scans in obese patients especially when associated with other risk factors like clinical seat belt sign or airbag development, etc. Ultrasonography may be superior to CT in some cases because of the ability to dynamically and repeatedly assess the area of injury. By applying ‘point-of-care US imaging’ herniation can be induced or exaggerated via Valsalva maneuvers, which can facilitate the detection of hernia during dynamic assessment. In addition, the use of point-of-care US allows to assess gastric contents and determine aspiration risk in obese patient presenting for elective surgery, and new point-of-care US tool to aid in detection of liver stiffness in obese patients. TAWH presents a diagnosis as well as a therapeutic challenge^[11]. In case of absence of surgical treatment for post-TAWH, it could cause incarceration and strangulation^[10]. Therefore, it is important to know these abdominal wall lesions and the commonly associated injuries to provide optimal management. Generally, like in our case report, if we have only a TAWH with no associated lesion, there is no indication for emergent surgery. The laparoscopic repair of TAWH is feasible and safe^[12]. It should be considered as an alternative approach to open surgery with potentially less morbidity and enhanced postoperative recovery. The timing of repair and mesh used to treat abdominal wall defects were widely debated in the literature. Karhof *et al.*^[4] in a systematic review and meta-analysis published in 2019, concluded that the pooled analysis did not

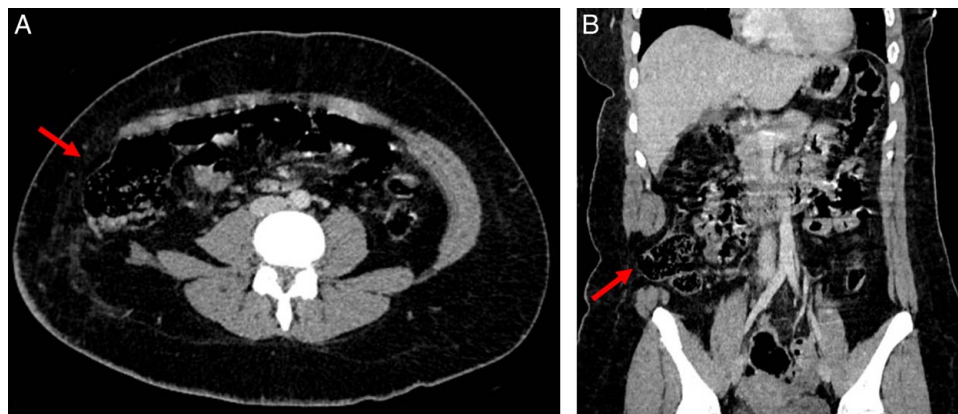


Figure 2. Computed tomography scan view showing the herniation (red arrow) of the right colon through the lateral abdominal wall muscle defect (A: axial view; B: coronal view).

show significant differences in either mesh versus no mesh repair or acute (before 2 weeks) versus delayed (after 2 weeks) repair following the trauma. Therefore, a patient's condition, essentially in case of concomitant injuries, should determine the timing of repair. On the other side, this study reported a 70% of recurrence in the no mesh group. Then we suggest the use of a mesh when it is feasible. Finally, we should highlight that the best therapeutic approach is governed by a multitude of factors emphasizing the need for a patient-tailored, case-by-case management plan^[11].

Conclusion

TAWH is a rare clinical entity. It may alert to associated trauma lesions. The best imaging modality for diagnosis is the CT scan. In addition, it allows a classification of the hernia and a screen for other injuries. The presence of an isolated TAWH must lower the threshold to closely monitor or to operatively explore in case of clinical doubt, given the high rate of false-negative findings at imaging features.

Ethical approval

Not applicable.

Consent

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

M.A., S.A., A.Z., and Y.K. investigated the radiological findings. M.A., S.B.K., and F.N. were the surgeons following-up the patients. M.B.M. and S.C. carried out the patient in ICU. Y.K., A.A., and M.M. participated in writing of the paper. All the authors revised the final version of the manuscript.

Conflicts of interest disclosure

None.

Research registration unique identifying number (UIN)

This is not an original research project involving human participants in an interventional or an observational study but a case report, this registration was not required.

Guarantor

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Provenance and peer review

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References

- [1] Alhadeedi O, Gruner L, Lasseur A, *et al.* Traumatic abdominal wall hernia – a series of 12 patients and a review of the literature. *World J Surg* 2021;45:2742–6.
- [2] Benini B, Ceribelli C, Staltari P, *et al.* Colonic strangulation and perforation in traumatic abdominal hernia: unusual emergency treatment for a rare trauma complication. *Updat Surg* 2012;64:227–9.
- [3] Selby CD. Direct abdominal hernia of traumatic origin. *J Am Med Assoc* 1906;XLVII:1485–6.
- [4] Karhof S, Boot R, Simmermacher RKJ, *et al.* Timing of repair and mesh use in traumatic abdominal wall defects: a systematic review and meta-analysis of current literature. *World J Emerg Surg* 2019;14:59.
- [5] Theodorou CM, Stokes SC, Beres AL. Traumatic abdominal wall hernia in children: a systematic review. *J Surg Res* 2021;262:181–9.
- [6] Agha RA, Franchi T, Sohrab C, *et al.* The SCARE 2020 guideline: updating consensus Surgical Case Report (SCARE) guidelines. *Int J Surg* 2020;84:226–30.
- [7] Matalon SA, Askari R, Gates JD, *et al.* Don't forget the abdominal wall: imaging spectrum of abdominal wall injuries after nonpenetrating trauma. *Radiographics* 2017;37:1218–35.
- [8] Nacef K, Chaouch A, Chaouch MA, *et al.* The hepatothorax: an unusual complication of right sided diaphragmatic injuries [L'hépatothorax: Une complication rare des plaies diaphragmatiques droites]. *Jr Med Res* 2018;1:22–5.
- [9] Bjork LB, Bellew SD, Kummer T. Point-of-care ultrasound diagnosis of traumatic abdominal wall hernia. *Pediatr Emerg Care* 2017;33:367–9.
- [10] Steenburg SD, Padilla-Jones B, Lee JT, *et al.* Traumatic abdominal wall injuries – a primer for radiologists. *Emerg Radiol* 2021;28:361–71.
- [11] Al Beteddini OS, Abdulla S, Omari O. Traumatic abdominal wall hernia: a case report and literature review. *Int J Surg Case Rep* 2016;24:57–9.
- [12] Rowell EE, Chin AC. Laparoscopic repair of traumatic abdominal wall hernia from handlebar injury. *J Pediatr Surg* 2011;46:e9–12.