

# Missed Traumatic Abdominal Wall Hernia: Report of a Case and Literature Reviewing

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## Abstract

Blunt trauma to the abdominal wall can cause a hernia, quite a rare condition. Once diagnosed, it should be repaired, because any delay in the management results in an increase in morbidity and mortality. We report a case of a 41 year old female that developed Traumatic Abdominal Wall Hernia in the right upper quadrant following a Road Traffic Accident. She was diagnosed one month later by physical examination which was proved by a Computed Tomography scan of the abdomen. An open surgical repair with mesh was done, and the post-operative course was uneventful.

**Keywords:** Jordan, Missed, Traumatic Hernia.

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## Introduction

Although the incidence of Traumatic Abdominal Wall Hernia (TAWH) is estimated to be 1%,<sup>(1, 2)</sup> there is a significant increase in number of reported cases worldwide during the last two decades. It is believed that improved imaging modalities, especially the Computed Tomography (CT) scan, aided in achieving an early and accurate diagnosis in trauma victims. Despite this, it is still easily missed on initial presentation.

We are reporting a case of TAWH diagnosed

one month later, following a Road Traffic Accident (RTA). The peculiar about this case is the presence of hernial sac, and its location in the right upper quadrant of the abdomen.

## Case Report:

A 41 year old female patient, presented with right upper quadrant bulge associated with discomfort. One month before the presentation (28/10/2011), she was involved in a RTA (Overturning of bus on a highway). She was admitted at that time to another hospital. The

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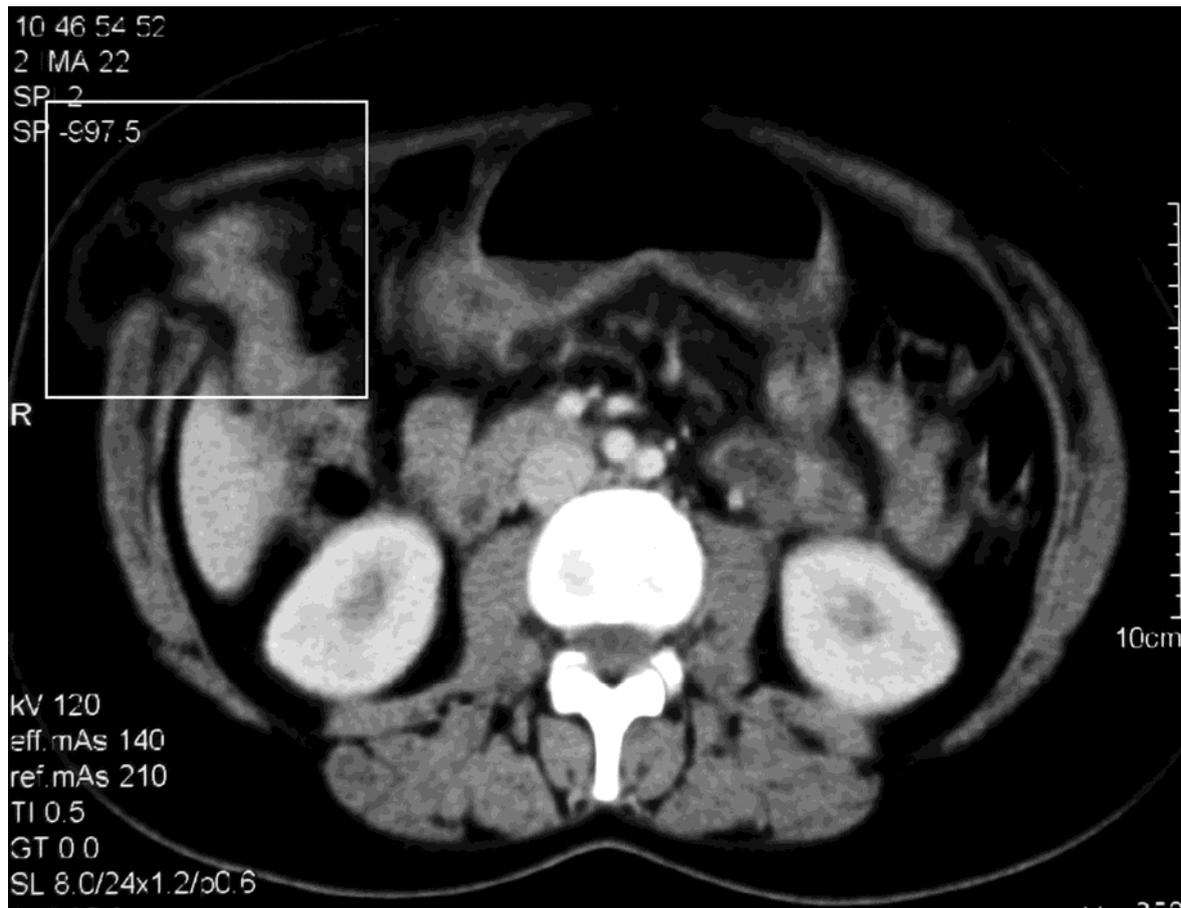
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patient was conscious when she arrived to the emergency department, complaining of headache and abdominal bulge with ecchymosis over it. A brain, abdomen and pelvis CT scans were performed, all were normal. The impression about the abdominal bulge was a hematoma. The patient stayed for 2 days for observation and then she was discharged.

One month later, she presented to our clinic at Jordan University Hospital, Amman/Jordan, with a swelling in the right upper quadrant increasing gradually in size, increasing in size upon coughing

or straining and associated with some discomfort. The patient denied any abdominal pain, or vomiting or any change in bowel habits. On examination, there was a right upper quadrant bulge, slightly tender, reducible, with positive cough impulse.

Initial laboratory workup revealed anemia (Hemoglobin 9.77 g/dL) while the other results were within normal range. A chest radiograph was done and it was normal. A CT scan of the abdomen was done at our hospital, showed a wide right antero-lateral abdominal wall defect, containing few bowel loops and mesenteric fat (Figure 1).



**Figure 1: CT scan showing the disruption in the abdominal wall muscles and fascia with herniation of small bowel loops through it**

During surgery, a subcostal skin incision was made, opening layer by layer. Fibrosis in the subcutaneous tissue between the skin and the

abdominal wall was noted, indicating the previous hematoma. A weakening and thinning of the abdominal wall in the right antero-lateral area

below the costal margin was noticed, with a defect measuring 5 X 5 cm, with. A hernial sac was identified with small bowel and omentum adherent to the sac. The defect was closed by a partially absorbable intermuscular mesh (ULTRAPRO®) and fascia was closed over it. The patient was hospitalized totally for 3 days, and the post-operative course was uncomplicated. At the follow-up one month post operation, the patient is doing well, with no evidence of recurrence.

#### Discussion:

Since the first ever reported case of TAWH by Selby in 1906,<sup>(3)</sup> the number of reported cases till this time is estimated to be 100 cases,<sup>(4)</sup> with no single case was reported from Jordan.

TAWH is defined as herniation of viscera occurring after a force is applied on the abdomen in a patient without preexisting abdominal hernia, resulting in disruption of muscles and fascia with maintaining skin continuity.<sup>(5-8)</sup> The criteria for diagnosing TAWH were suggested by McWhorten in 1939, and they are: 1- Immediate occurrence following blunt trauma, 2- Severe pain at the site of the injury, 3- Which cause the patient to present in the first 24 hours, 4- No previous hernia.<sup>(7)</sup> Later, these criteria have been modified to include: Intact Skin over the hernia and no evidence of hernial sac during surgery.<sup>(7-9)</sup> Our case fits all the criteria except for the late presentation and presence of hernia sac which was confirmed by histopathology, although it's reported that absence of hernial sac is not essential.<sup>(10)</sup>

The mechanism of TAWH is thought to be caused by shear stress associated with acute elevation of intra-abdominal pressure, the shear stress is transferred to the peritoneum, fascia and muscle fibers followed by tissue rupture.<sup>5</sup> It was reported that these injuries were mostly located below the umbilicus due to weaker musculature since the rectus sheath is present only above the arcuate line,<sup>(6)</sup> and it is not necessarily to represent

the site of the trauma.<sup>(9, 11, 12)</sup> When traumatic insult to the abdominal wall is mainly due to shearing stresses or tensile forces, intra-abdominal injuries are extremely uncommon.<sup>(7)</sup>

Most of these patients present immediately following the trauma, and just 26% present later.<sup>(13)</sup> The classical signs of hernia (i.e., cough impulse and reducibility) are present in only 50% of patients, thus it can be confused with a hematoma. An interesting feature recorded in such a situation is the tendency of such hernias to increase in size over a short period of time.<sup>(14)</sup>

Ultrasound of the abdominal wall is still widely used because of its availability and relatively low cost. For the first evaluation in the emergency room, the ultrasound is easily accessible and can be helpful for primary diagnoses.<sup>(15)</sup> However, the sensitivity and specificity of the CT scan is much higher and also enables better imaging of the abdominal wall and the intra-abdominal organs which is of interest in the abdominal trauma patient.<sup>(11)</sup> At present we think CT scan is the standard for diagnosis of any form of abdominal wall hernia since the relationship between the different muscle layers and surrounding structure is better visualized.<sup>(11)</sup>

Surgical intervention remains the mainstay of management in these patients,<sup>(9, 16)</sup> although conservative management has been reported in the literature.<sup>(1, 17)</sup> But there is controversy on whether to operate immediately or later. Majority of surgeons prefer to operate immediately, and some after a period of conservative management.<sup>(13, 18)</sup> When to do the operation depends on some factors, other than the surgeon preference, the timing of presentation, unfitness for surgery, occurrence of complications, hemodynamic status and severity of associated injuries.<sup>(7, 10, 13, 14, 19)</sup> Surgery is necessary to avoid complications, such as incarceration and strangulation of bowels.<sup>(5, 6, 8, 13, 17, 20, 21)</sup>

Despite the trend to use the laparoscopic approach in treatment of incisional hernias,<sup>22</sup> it still

little practiced in cases of TAWH.<sup>(19,23)</sup> Open surgery was selected in most of the reported cases in the literature.<sup>(4, 13, 20, 24-26)</sup> Debates exist on whether to use a midline incision or an incision over the hernia. In the majority, midline incision was chosen in acute cases, to rule out associated intra-abdominal injury which occurs in about 30% to 44% of patients in high energy trauma.<sup>(1,12,17,23, 26)</sup> While in low energy induced TAWH, local exploration through an incision over the hernia is preferred.<sup>(5, 18, 25)</sup> In our case we used an incision over the hernia, because of the late presentation of the patient.

The main goal of surgery is reconstruct the disruption of the abdominal wall, which can be achieved either by primary closure or by applying a mesh. It depends on the size and site of hernia, associated intra-abdominal injury and timing of intervention.<sup>(2, 4)</sup> In TAWH induced by low energy, a primary repair, by approximation of the defect

using non-absorbable sutures, was the first choice, because in these cases the soft tissue damage and defect size is minimal.<sup>(8, 16, 24)</sup> On the other hand, in high energy TAWH, the defect size is usually larger and tissue loss is greater, which can't be repaired primarily. So mesh is preferred, with additional benefit by decreasing the recurrence rate.<sup>(2, 5, 6, 19, 21, 23)</sup> But not to forget the increased risk of infections in these circumstances.<sup>(18)</sup>

### Conclusion:

Traumatic abdominal wall hernias represent a rare entity of hernias in general, making their diagnosis a challenge for the treating physician. Delay in treatment results in increased morbidity and mortality. CT scan is the investigation of choice for these cases. Surgical repair in the main line of treatment with variation in timing of repair, open vs. laparoscopic, and primary vs. mesh repair.

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## فتق رضي فائت لجدار البطن: تبليغ عن حالة مع مراجعة المنشورات

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### الملخص

الصدمة الرضية لجدار البطن يمكن أن تسبب الفتق، وتعد هذه الحالة نادرة. عندما تُشخص، ينبغي إصلاحها، لأن أي تأخير يؤدي إلى زيادة في معدلات الاعتلال والوفيات. حيث نبليغ عن حالة امرأة عمرها 41 سنة والتي عانت من فتق رضي في جدار البطن في الربع العلوي الأيمن، إثر حادث مرور. تم تشخيص إصابتها بعد شهر واحد عن طريق الفحص السريري والذي ثبت من خلال مسح التصوير المقطعي للبطن. وقد تم إجراء عملية جراحية لعلاج الفتق وكانت وضع المريضة ممتاز بعد العملية.

الكلمات الدالة: فتق رضي، جدار البطن.