



## Seatbelt Sign Associated with Traumatic Abdominal Wall Hernia: A Case Report

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### Introduction

Traumatic Abdominal Wall Hernia (TAWH) is a rare diagnosis associated with blunt abdominal trauma. Morbidity due to TAWH may be significant. The diagnosis is not straightforward and TAWH is often identified on computed tomography or intra-operatively.

### Case Presentation

A 34 year old male restrained driver was involved in a single vehicle road traffic accident at unknown speed. He was brought into the emergency department by ambulance in full spinal precautions. He was previously well with no past medical history. On arrival the patient had normal vital signs with GCS 15/15. He was assessed in keeping with full ATLS protocols. Abdominal assessment revealed bruising across the lower abdomen consistent with 'seat-belt sign' with tenderness and guarding in right lower quadrant. Clinically the patient appeared otherwise uninjured. The bedside Focused Assessment with Sonography in Trauma (FAST) scan was negative for free fluid. Contrast enhanced Computed Tomography (CT) of the abdomen demonstrated a wide-necked (2.5 cm) abdominal wall hernia at the right iliac crest containing fat with associated stranding and a trace of fluid in the right anterior abdominal wall muscles and subcutaneous tissues extending to the right inguinal region. The patient suffered no concomitant injuries. The patient was treated non-operatively and admitted for observation (Figure 1 and 2).

### Discussion

Traumatic Abdominal Wall Hernia (TAWH) is a rare form of hernia that is caused by disruption of the abdominal wall musculature and fascia (while the skin is still intact) following blunt abdominal trauma [1]. As seen in our case previous studies have reported the association between seat belts and TAWH [2,3]. The seat belt may cause a sudden increase in intra-abdominal pressure, leading to rupture of the abdominal wall [1]. A study with 3,947 blunt trauma patients reported a 0.9% incidence rate of TAWH [4]. As seen in this case, Pardhan et al. [5] reported that TAWH is most frequently located in the right lower quadrant. This type of abdominal wall hernia was first described by Shelby more than 100 years ago, with around 250 cases reported in medical literature [6]. Despite this, diagnosis remains a challenge. Small hernias are often disguised with bruising and hematoma and may be missed on clinical examination. A high index of suspicion is required as TAWH is associated with concomitant complex injuries. A retrospective analysis of 80 cases of TAWH revealed that the associated injuries included lumbar spine fractures, pelvic fractures, splenic injuries, and bowel injuries [7]. Retrospective study results from Hickey et al of

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Figure 1: Slice of contrast enhanced computed tomography of abdomen revealing wide-necked (2.5 cm) abdominal wall hernia at the right iliac crest.



**Figure 2:** An example of seatbelt sign in blunt abdominal trauma.

patients with TAWH demonstrated by CT scanning (N=15), showed the prevalence of associated injuries to be as high as 100% [8]. The failure to diagnose TAWH may also lead to complications resulting from the hernia. Incarceration and strangulation of the intestine have been described [8]. For the initial evaluation in the emergency department, ultrasound is easily accessible and can be helpful for primary diagnosis [9]. However, most cases of TAWH are diagnosed by abdominal CT, as seen in this case, as it is widely used in the assessment of high energy trauma [1]. CT also has the advantage of enabling the identification of potential concomitant injuries which were not present in this case. Surgical intervention is regarded as the treatment of choice for any form of TAWH [10]. The choice of treatment of TAWH is dependent on clinical status of the patient, concomitant injury and size of the abdominal wall defect.

## Conclusion

TAWH is a rare hernia following blunt abdominal trauma. It represents a diagnostic and therapeutic clinical challenge. Computed

tomography is often instrumental in making the diagnosis. High clinical suspicion and knowledge of the pathophysiology of this rare diagnosis may facilitate early recognition and treatment.

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