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**Case Report**

# A Case of Traumatic Abdominal Wall Hernia Following a Road Traffic Accident

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**ABSTRACT**

**Background:** An extremely rare kind of hernia is the traumatic abdominal hernia. It is frequently misdiagnosed, and diagnosing it calls for a high degree of suspicion.

**Case history:** Following a collision with a scooter and a blow to his abdomen from one of the handles, a 40-year-old man was brought to the emergency room complaining of abdominal pain. A left lower abdominal wall hernia was suggested by USG-eFAST. Hernioplasty with meshplasty was performed on the patient.

**Results:** There were no complications following surgery.

**Conclusions:** When a patient is diagnosed with a traumatic abdominal wall hernia, they should have a thorough examination to rule out early signs of organ damage and then have their abdomens radiologically examined to check for intra-abdominal injuries. The diagnosis and treatment of these cases still depend heavily on clinical examination and judgment. Given the possibility of the bowel loop becoming incarcerated, the definitive course of treatment, in this case, is surgical exploration combined with the primary repair of the defect.

**Keywords**: Abdominal wall, Traumatic hernia, Hernia

## INTRODUCTION

A hernia is an abnormal protuberance of a viscus, part of the viscus, or tissue through an opening in the layer that normally contains it.[1] A blunt traumatic abdominal hernia can be defined by the protrusion of a viscus, or portion of a viscus, or tissue through damaged fascia and musculature, without skin penetration and a history of previous defects at the site of injury.[2] The traumatic force may not have enough energy to penetrate the skin due to the elastic nature of the skin, but it may have enough energy to cause damage to the muscle fibers, fascia, and peritoneum.[3] Hernias that are uncommon and frequently go undiagnosed include traumatic abdominal wall hernias. Less than 1% of cases are reported following blunt abdominal trauma.[4] Patients with traumatic abdominal wall hernia may have a poor prognosis if diagnosis and treatment are delayed. The case of a 40-year-old man who suffered a traumatic abdominal wall hernia after being in a vehicular accident is presented here. The patient only showed pain and superficial skin injuries along with a lump over the left lower abdomen, and no other trauma-related symptoms. A hernia was suggested by USG-eFAST. Important aspects of surgical management and radiological and clinical diagnosis are discussed, based on our experience.

## CASE HISTORY

After being involved in a road traffic accident, a 40-year-old man complained of abdominal pain and visited our hospital's emergency room. He had been hit by a scooter with one of the handles of the scooter hitting his abdomen. Upon examination, his vital signs were stable. A local examination revealed swelling and an abrasion over the abdomen's left lower quadrant. The size of the abrasion was 2 x 2 $cm^2$. The swelling measured 6 × 8 × 4 $cm^3$, was soft,

reducible, non-tender, and expanded upon coughing. There was no local rise in temperature or redness on the skin surrounding the swelling. There was a gurgling sensation when the swelling was reduced [Figure-1: Anterior (A) and lateral (B) views demonstrating lower abdominal wall swelling with an overlaying skin contusion].

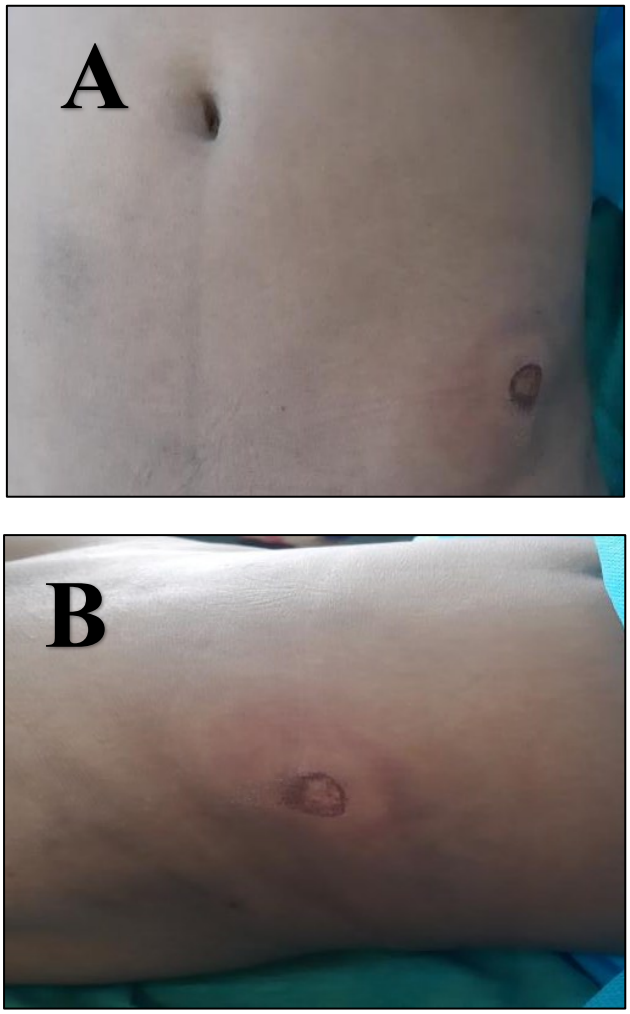


**Figure-1**: **Anterior (A) and lateral (B) views demonstrating lower abdominal wall swelling with an overlaying skin contusion**

Any prior defects in the abdominal wall were denied by the patient. His NCCT brain was normal, his ECG was NSR, and his blood investigations were within normal range. A fascial breach overlying the swelling was revealed by ultrasound e-Fast, with bowel loops extending up to but not beyond the fascial defect. After a thorough clinical assessment and radiological examination, the patient was diagnosed with a traumatic abdominal hernia, and emergency surgery was performed. An emergency open hernioplasty with meshplasty was performed.

Over the swelling, an oblique incision was made [Figure-2: Oblique incision given over the swelling]. Subcutaneous tissue and superficial fascia were incised. There was a bowel loop found in the lower abdomen's subcutaneous tissue. It was observed that the peritoneum was torn and that the bowel loops were herniating through the damaged fascia and muscles [Figure-3: Bowel loops seen herniating through muscle and fascial defect]. The peritoneum and fascia were sutured electively to repair the hernia because the intestine was found to be healthy. Sublay prolene mesh was used [Figure-4: Sublay mesh being placed], and the abdomen was closed in layers [Figure-5: Closure of fascia]. The hospital stay following the surgery was uneventful.

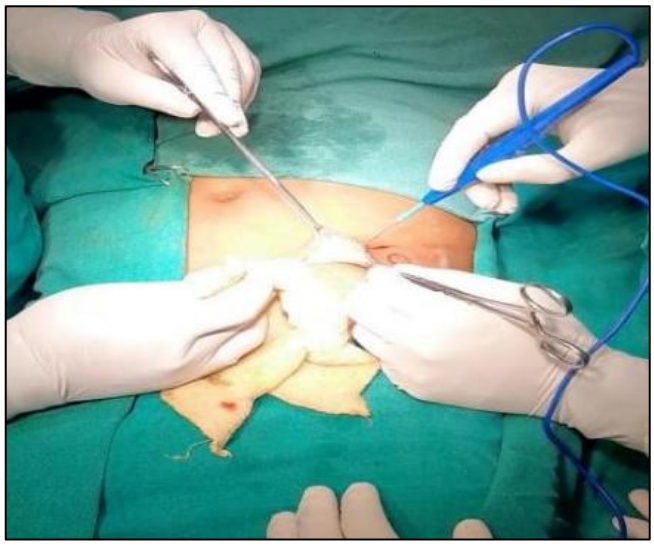

**Figure-2: Oblique incision given over the swelling**

**Figure-3: Bowel loops seen herniating through muscle and fascial defect**

**Figure-4: Sublay mesh being placed**

**Figure-5: Closure of fascia**

## DISCUSSION

Traumatic hernias are the result of non-anatomical flaws brought on by trauma. They are divided into three categories:

* Hernias through stab wounds in the abdomen. In real terms, these are incisional hernias.
* Hernias caused by rips or splits in the abdominal muscles following blunt force injuries.
* Swelling of the abdomen as a result of muscle atrophy brought on by trauma, nerve injury, or other denervation. These may also develop following intercostal nerve damage from rib fractures.[1]

After blunt trauma, a rare kind of hernia called traumatic abdominal wall hernia (TAWH) can develop. "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" is how it is defined.[2] It occurs after abrupt, high-energy blunt trauma from motor vehicle collisions; concentrated low-energy impact, like handlebar injuries; or deceleration injuries, like seat belt syndrome.[5] Muscle and fascia are disrupted as a result of the tangential force and increased intra-abdominal pressure. Therefore, concurrent intra-abdominal injuries such as pelvic fractures or lumbar spine injuries may manifest as TAWH.[6] Most documented cases of traumatic abdominal wall hernias were caused by handlebar or seat belt injuries.[7] The size and the force of the impact, and the pressure load distribution all affect the likelihood of the abdominal wall being disrupted. Because the skin is more elastic, it does not tear when the fascia and underlying musculature are damaged, which can result in traumatic abdominal hernias.

TAWH ought to always be considered when evaluating patients who present with visible abdominal wall soft tissue injury after blunt trauma, as these hernias can remain undetected because of the preservation of the overlying skin. According to a Coleman et al. incidence study, the flank (47.5%) and abdominal wall (17.5%) are the most common sites of herniation.[8] Sometimes the mass—that is, the hernia itself—is mistaken for a hematoma.[9] If the manner of injury and clinical examination raise clinical suspicion, multiple imaging modalities ought to be employed. The primary and quickest imaging method for TAWH diagnosis is ultrasonography. In hemodynamically stable patients, CECT has emerged as the gold standard for imaging intra-abdominal injuries, including TAWH.[10] It was a clinical diagnosis of traumatic hernia in our case.

The cornerstone of TAWH treatment is surgery. The patient's condition determines when the surgery will take place. Patients with hemodynamic instability should be treated following institutional trauma guidelines. Simultaneous repair of the TAWH during exploration is feasible in hemodynamically stable patients with minimal intra-abdominal injuries. The degree of the injury, the extent of the defect, and the likelihood of incarceration are additional factors to take into account.[11] Elective repair should be carried out in hemodynamically stable asymptomatic TAWH patients if there is no other reason to proceed with immediate surgery. There are two categories for elective repair: acute, which occurs within two weeks of the trauma, and delayed, which occurs beyond two weeks.[12] Delaying repair has the benefit of potentially allowing the hernia sac to develop, which facilitates the layout and incorporation of the mesh and makes it simpler to identify the muscular borders. They do, however, come with a significant risk of incarceration and strangulation.[13] The extent of the local injuries and any concurrent injuries should be taken into consideration when choosing when to repair. As a result, tailored treatment plans need to be developed for each patient.

Using a similar strategy to that used for laparoscopic inguinal hernia repair, a laparoscopic tension-free mesh repair is possible.[14] Reduced recurrence and utility in fixing large defects in cases are two benefits of mesh repair. The mesh has drawbacks, including the potential for intestinal adhesion and erosion in trauma situations, as well as infections.

The magnitude of the injuries, the co-existing injuries, the method of injury, and the surgeon's skill set must all be carefully considered when deciding between laparotomy and laparoscopic surgery. We took an open approach with our patient because of the risk of complications. However, on opening of the defect the bowel appeared unharmed and healthy. Thus, meshplasty was used to repair the peritoneal defect.

## CONCLUSIONS

We presented a unique instance of an effective hernioplasty for a traumatic abdominal wall hernia. Any patient presenting with swelling over the abdominal wall after abdominal trauma should be evaluated for TAWH. Upon diagnosis of traumatic abdominal wall hernia, patients should undergo radiological exploration as soon as feasible to check for intra-abdominal injuries. A thorough examination should then be performed to look for early signs of organ damage. The possibility of both early and late imprisonment of the intestine in the defect, which could result in a subsequent perforation or strangulation, must always be kept in mind. Surgical repair is the primary treatment for TAWH; however, treatment techniques and defect closure methods must be tailored to the patient's specific circumstances.

### Consent

For the publication of this case report and any related photos, the patient provided written and informed consent.

### Authors' contributions

Biswajit Das has made significant contributions to the concept and design and is the main author. Sabari Vasan, Akshit Minocha, and Tapash Kumar Kalita have been involved in the drafting of the manuscript and have critically revised it for intellectual content. Tapash Kumar Kalita is the corresponding author. All authors read and approved the final manuscript and have agreed to be accountable for all aspects of the work.

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