Introduction

Traumatic abdominal wall hernia (TAWH) is a rare consequence of blunt force injury that causes a defect in the abdominal wall musculature and fascia without penetrating the skin. The prevalence of TAWHs in blunt trauma patients at Trauma Centers in published series is approximately 1% (1-4).

The mechanism of this injury includes a sudden increase in intra-abdominal pressure and extensive shear forces applied to the abdominal wall. The most frequently described type of TAWH is the "handlebar hernia" due to blunt trauma, caused by the end of a bicycle handlebar, that often occur in children even after relatively minor trauma.

The diagnosis of TAWH is rarely made. Morbidity due to TAWH, however, may be significant. In contrast, the wall defects resulting from penetrating trauma are usually recognized and repaired thus rarely leading to TAWH.

We report a rare case of TAWH by work accident with delayed diagnosis.
Case report

A 49-year-old man presented to the Emergency Room of another hospital soon after a work accident (an heavy steel tube fell to the abdominal wall from 5 meters height). Laboratory studies, chest radiographs, abdominal radiographs and ultrasonography (US) were normal. Then, he was discharged 48 hours after.

Seven days after, he presented to our Emergency Room with severe abdominal pain and constipation since about 36 hours. Upon physical examination, right abdomen was found to have a bulging mass, very painful, with definite round ecchymosis that seems to be not reducible hernia (Fig. 1). Abdominal radiographs demonstrated no residual colonic gas. In correspondence of the mass, US and computed tomography (CT) showed intestinal herniation through an abdominal wall defect into the subcutaneous space (Figs. 2 and 3).

The patient underwent surgery. The skin incision was made on the mass. The small bowel, with initial vascular suffering, was herniated into the subcutaneous fat layer through a left abdominal wall defect of about 5 cm. The defect was in external and internal oblique muscle and transverse muscle of abdomen. There was no perforation or ischemic change of the herniated viscus. The wall defect was closed using extraperitoneal not absorbable polypropylene round mesh placed on the muscular plane with an overlap of 4 cm. Patient’s postoperative course was uneventful. He was discharged 3 days after.

At 2-year follow-up there is no recurrence.

Discussion

At present the most common mechanism of injury leading to a TAWH is motor vehicle collision especially in young people. Shelby (5) was the first to report a TAWH following trauma in 1906. The TAWH can be classified on the basis of the mechanism of trauma into low or high energy injuries (6). Low energy injuries occur after impact on a small blunt object and typically have no associated intra-abdominal injury. The mechanism of injury is mainly due to a tangential shearing type of insult that produces a disruption of the muscle fibers. High energy injuries are sustained during motor vehicle accidents or automobile versus pedestrian accidents or falling from heights. In high energy blunt trauma the muscular disruption is often related to pelvic ring or costal fractures. In automobile accidents the seatbelts riding up the iliac crest, causing avulsion of abdominal wall musculature from the bone, also occurs (6). Differing patterns of muscular and fascial disruption can occur due to the different types of force involved as well as the tensile properties of the various areas in the abdominal wall. The anatomical defects vary from small tears to large disruption.

Dimyan et al. (7) reported on the injury due to blunt trauma caused by the end of a bicycle handlebar and was the first to use “handlebar hernia” to describe these injuries. This type of hernia is often reported in children; with this mechanism the low force of impact occurs in a small area to disrupt muscle and fascia but not the skin because it is more elastic and it is not penetrated.
Traumatic abdominal wall hernia. Case report

In the multitrauma patients, US of the abdominal wall is widely used for the first evaluation in the emergency room and can be helpful for primary diagnosis (12). Generally the sensitivity and specificity of US is not high at first examination because the wall defects without skin lacerations are not a priority during the initial assessment.

The CT has a higher sensitivity and specificity and also enables better imaging of the abdominal wall and the intrabdominal organs (10).

Our case report demonstrates how difficult is the diagnosis of TAWH. In patients with abdominal trauma, especially when vital signs are good, primary diagnosis is directed towards the detection of internal injuries more dangerous to life. If US does not demonstrate internal injuries, second step should be directed to the study of the wall, in the site of pain, where there is evidence of hematoma or ecchymosis.

Conclusions

Traumatic hernia of the abdominal wall is a rare type of hernia because the abdominal wall is elastic and can tolerate big pression on muscles. A high level of clinical suspicion is required for diagnosis because of the high rate of associated injuries. In these cases the first aim is to detect internal injuries but, if dynamics of the trauma and clinical examination suggest a suspicion of TAWH, it requires CT scan and/or US for the study of the abdominal wall.

Surgery with primary repair of the defect is the definitive treatment in cases of traumatic hernia.

References