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RESEARCH ARTICLE

ISOLATED JEJUNAL PERFORATION (BLOWOUT) FOLLOWING MOTOR VEHICLE ACCIDENT

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ABSTRACT

Small bowel perforation may be suspected according to patient's clinical presentation with high index of clinical suspicion, or existence of extra luminal air foci on diagnostic imaging usually performed to evaluate abdominal pain such as CT scan with double contrast or by help of focused abdominal Sonography for trauma (FAST) exam or diagnostic peritoneal lavage (DPL). Blunt traumatic perforation following motor vehicle accidents (MVA) can occur with severe abdominal trauma mostly related to part of the gastrointestinal tract is compressed against a fixed bony structure. Although single isolated perforation (blowout) of the jejunum(IJP) following blunt abdominal trauma (BAT) is uncommon, We present a case of isolated jejunal perforation (IJP) in a young Saudi male who was admitted to our facility with severe abdominal pain following MVA, although erect chest X-ray was unremarkable for free air abdominal CT scan revealed evidence of extra-luminal air foci (pneumoperitoneum). Exploratory laparotomy that followed revealed isolated 3 cm long perforation of the proximal jejunum, approximately 40cm from Treitz ligament and managed appropriately, so high index of suspicion and suitably timely surgical intervention led to successful outcome.

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INTRODUCTION

Blunt abdominal trauma (BAT) can result in injury to any of abdominal organs but isolated jejunal perforation (IJP) is extremely rare, considerable majority of bowel perforations following BAT is caused by road traffic accident. The first case of intestinal rupture secondary to blunt trauma was reported by Samuel Annan in 1837 (Griswold, 1961). IJP occurs in less than 1% of blunt abdominal trauma. The incidence of small bowel injury appears to be lower in children than in adults (Thompson, 2005). A sudden excess in intraluminal pressure in an air or fluid filled bowel loop cause split or diastatic rupture or blowout on the antimesenteric border of the bowel. Robbs *et al.* in 1980 reported five such lesions in Zulu tribesmen, mostly caused by a blow to the abdomen with a heavy, round-headed weapon (Robbs, 1980), because such these perforations are not encompassed by necrotic tissue and not seemed to be resulted from crushing type injury, they are concerned as "blowout" perforations. In deeply sedated patients with poly trauma, the diagnosis of single IJP is outstanding dilemma, so it is easy to miss such these injuries in BAT cases as haemodynamically stable patients are managed in conservative way.

CASE REPORT

A 23 year old Saudi male was admitted in our Hospital /Prince Mutaib bin Abdulaziz / with history of BAT following MVA, presented by severe central abdominal pain, no contusions or other external injuries are noted on his physical examination. He was conscious oriented to time, place and person, he reported a steering wheel had hit his anterior abdominal wall, his vital signs were normal and examination of the abdomen does not reveal any bruise or seatbelt mark but was markedly tender with some guarding. Hematology tests showed leukocytosis and slight elevation in liver function tests, while kidney function tests were within normal limits. Chest X ray does not show any free gas under diaphragm (Figure 3). Abdominal X ray showed sentinel small bowel loop. Abdominal ultrasound was negative for both free fluids intraperitoneal and solid organ injury (Figure 7). CT scan abdomen with intravenous contrast was made immediately and revealed: a long segment of the jejunum showing thickened wall (reaching up to 9 mm), with related hematoma of its mesentery together with few extra-luminal small air foci denoting pneumoperitoneum (Figure 4,5,6), and on the background history of trauma features are matching with traumatic jejunal perforation. Mild amount of free intraperitoneal fluid peri-hepatic and bilateral Para colic, rest of the exam showed no significant abnormalities.

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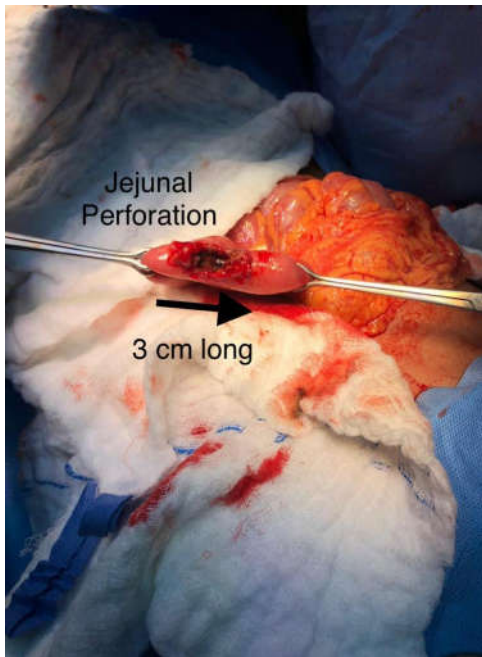


Figure 1. Jejunal perforation



Figure 2. Jejunal perforation after debridement

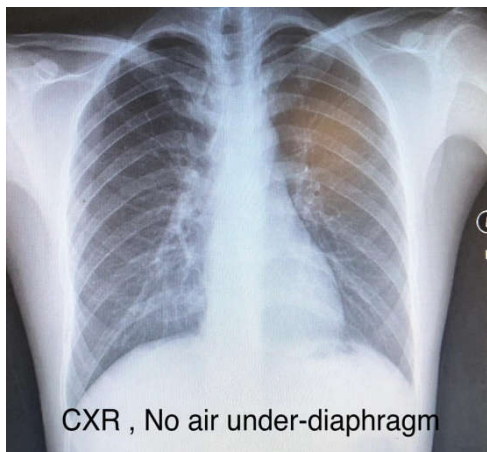


Figure 3. Chest X ray

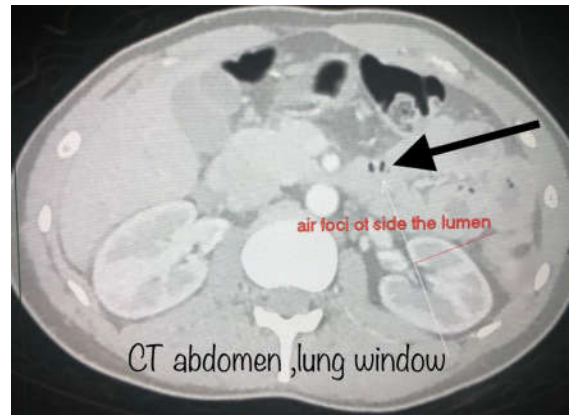


Figure 4. CT scan abdomen showed air foci outside lumen

So, Diagnosis of perforated viscus was made, and after consent and prophylactic antibiotics, urgent exploratory laparotomy was done that revealed minimal amount of bile-stained fluid and by inspecting the small bowel there was single IJP of size of 3cm at the antimesenteric border, 40 cm far from Treitz ligament (Figure 6, 7) perforation was repaired primarily in two layers exploration of the rest of the abdomen was unremarkable and abdomen was closed in mass layer after copious saline wash and mopped dry with towel without drains. Postoperatively, patient was shifted to the general ward and had smooth uneventful course and by the fifth postoperative day discharged from the hospital.

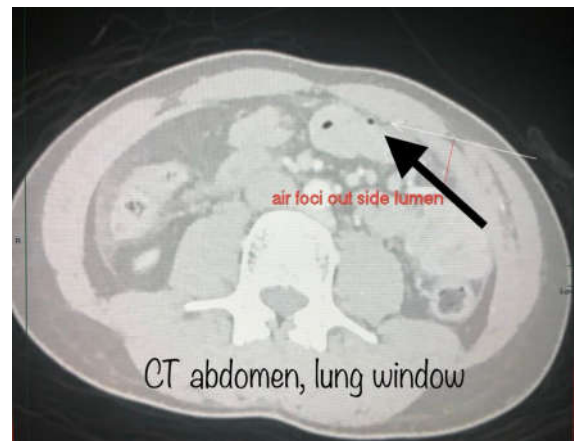


Figure 5. CT scan abdomen showed air foci outside lumen (another cut)

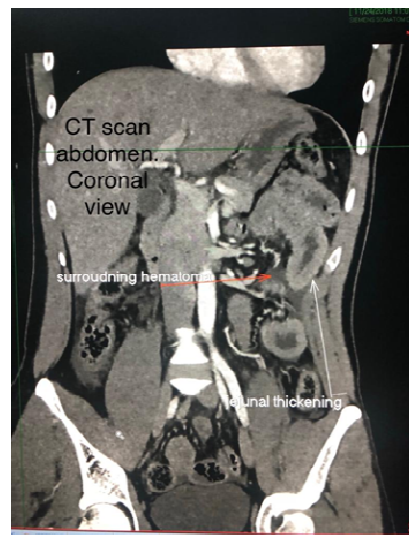


Figure 6. CT scan abdomen Coronal view

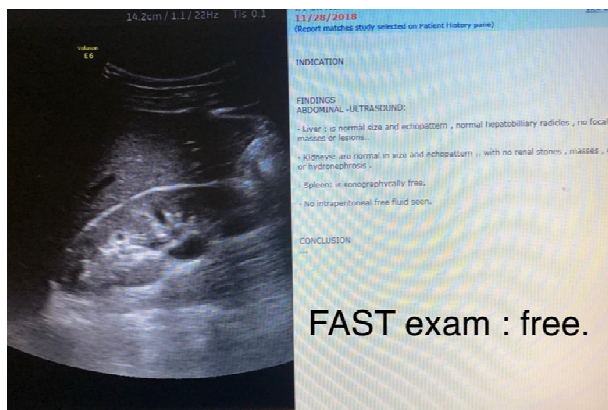


Figure 7. USG abd

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DISCUSSION

The abdomen represents the third most commonly injured part of the body following trauma. Early recognition of small bowel injury is important in the prevention of morbidity and mortality (Munshi *et al.*, 2006). 75% of blunt abdominal trauma are caused by motor vehicle accidents and the rest by other modes (Thompson and Holland, 2005). Jejunal perforation due to other injuries are.. hit by knee, assault by animal and injury with a bicycle handle bar (Allen *et al.*, 1998). Diagnosis of hollow viscus injury should be approached based on mechanism of trauma, which includes shearing forces, and compression between the abdominal wall and spinal column; and blowout perforation due to instant increase in intraluminal pressure in the bowel loop (as presumed to be in our scenario) and detailed history and repeated physical examination. Continuous abdominal pain (75.6%), tenderness (46.7%) and a bruise over the abdominal wall and seatbelt mark are important signs in bowel perforation (Robbs *et al.*, 1980; Fakhry *et al.*, 2000). Performing CT scanning of the abdomen is essential for early diagnosis, CT scanning remains the gold standard for assessment of BAT with sensitivity of 92% and specificity of 94%, positive predictive accuracy of 30% and negative predictive accuracy of 100% and overall accuracy (validity) of 94% (Sherck *et al.*, 1994). It is highlighted that CT scan might have the capacity to accurately diagnose blunt intestinal trauma providing it is performed and interpreted with care. It has proved to be an excellent imaging modality for diagnosis and management of haemodynamically stable patients with abdominal injuries do duty as a significant diminution in both morbidity and mortality in trauma patients (Frick *et al.*, 1999). Although the influence of operative delays on morbidity and mortality has been unclear even relatively brief delay as short as eight hours result in morbidity & mortality is directly assignable to a / missed / small bowel injury (Fakhry *et al.*,

2000). Small bowel perforation has low mortality and complication rate if it is treated earlier than 24 hours after injury. The rule (concept) to rushing to the operating room for a stable patient with blunt abdominal trauma without systemic physical examination is not justified. Delay in diagnosis does not seem to affect morbidity or mortality; commitment to close observation and frequent physical examinations will support in the timely identification of subtle small bowel injuries in BAT patients (Fakhry *et al.*, 2000) because of d. As physical examination is reliable in only 30% of BAT (Allen *et al.*, 1998). According to Schenk *et al.* (1983), there are no reliable signs or symptoms, and free air under diaphragm on erect chest plain radiographs is characteristically absent. Among 111 patients with small bowel perforations abdominal tenderness was a common finding, but it was not specific for bowel perforations. Only 40% of CT Scans were diagnostic for bowel perforations; 50% of them showed suggestive signs and 10% were considered as negative. Persistence of abdominal signs indicated peritoneal lavage (Fang *et al.*, 1999). According to Burney *et al.*,^[6] peritoneal lavage has proven sensitive in the demonstration of the hemoperitoneum, but is less reliable in the early diagnosis of the bowel injuries. Powell *et al.*, 1987 noticed that the routine use of peritoneal lavage in stable trauma patients often leads to non-therapeutic laparotomies. As mentioned above we can judge that the diagnosis of jejunal perforation in BAT is still challenging, so for ideal outcome watchfulness is needed with the considering of a high index of clinical suspicion.

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