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Case Report

Bucket handle injury of small bowel: a case report

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ABSTRACT

Hollow viscus or mesenteric injuries account for 1-6% of injuries in a patient with blunt abdominal trauma. A 63-year-old male, presented with a history of tree fall while he was on a two-wheeler. With a history of left hip pain and abdominal pain, examination revealed he was tachycardic, normotensive with abrasions and dislocation of left hip joint. Abdomen examination revealed diffuse tenderness with sluggish bowel sounds with blood at the meatus. FAST was positive. CECT showed mesenteric hematoma, intra-peritoneal rupture of bladder and multiple pelvic fractures. Laparotomy revealed a rent in the anterior wall and neck of urinary bladder, which was repaired along with a bucket handle tear of mesentery, 40 cm from ICJ, with gangrene of ileum which required resection anastomosis. Post-operative period was uneventful. Rapid deceleration in a road traffic accident causes shearing forces between segments of bowel fixed in the retroperitoneum and the more mobile peritoneal segments, which leads to avulsion of mesentery from the bowel known as bucket handle injury. These are traumatic ischemic injury, which require urgent surgical intervention. Due to the varying CT findings, a pre-operative diagnosis is very challenging and required high index of suspicion. Prompt diagnosis and surgical management is required to prevent delayed complications in bucket handle injuries of bowel.

Keywords: Bucket handle injury, Devascularising bowel injury, Deceleration injury, Shearing force, Mesenteric hematoma

INTRODUCTION

Hollow viscus or mesenteric injuries occur with a low incidence of 1-6% of patients with blunt abdominal trauma.[1] Accuracy of CT to differentiate Surgical Vs Non-surgical injuries is only 75%.[2]

It is critical to diagnose and estimate the degree of mesenteric injury, as it would help guide the line of further management. This case report is written according to the CARE guidelines.[3]

CASE REPORT

A 63-year-old male, presented to emergency department, 2 hours after a history of tree fall on the patient who was on a two-wheeler. He had a history of left hip pain and abdominal pain. There was no history of loss of consciousness, ENT bleeds, chest injury/pain. He was a known diabetic on oral hypoglycemic agents with no prior history of surgery. On physical examination, he had tachycardia 108/min, blood pressure of 120/70 mm of Hg, respiratory rate 20/min, no pallor. Externally, he had abrasions over forehead, left flank and left hip. His left lower limb was adducted and internally rotated suggestive of a likely dislocation of the hip joint. Per abdomen revealed diffuse tenderness with sluggish bowel sounds, external genitalia showed blood at the meatus. Per rectal examination was normal. Chest X-ray was normal and X-ray pelvis with both hips showed fracture dislocation of left femur with acetabulum. FAST was positive. As patient was hemodynamically stable, contrast enhanced computed tomography (CECT) was done which showed hemoperitoneum (2+), solid organs were normal,

small bowel mesenteric hematoma 2x1.8 cm suprapubic region, no extravasation/ pneumoperitoneum/ pneumatosis intestinalis. There was displaced fracture of sacral ala and acetabular fracture with undisplaced femoral head fracture (Figure 1). Cystography done showed intra-peritoneal bladder rupture due to extravasation of contrast into the peritoneal cavity. With a provisional diagnosis of blunt abdominal trauma with intra-peritoneal rupture of bladder with mesenteric hematoma, he was admitted in Trauma Unit and was resuscitated and blood crossmatched. On Laparotomy, there was a rent in anterior wall of bladder and neck with urethro- vesical dysjunction. Prostate was normal. So, the urology team did a bladder neck reconstruction with urethrovesical anastomosis. Supra-pubic cystostomy and Foley's catheter were inserted and kept in situ. A perivesical drain was placed. On other abdominal organ examination, to our surprise there was a bucket handle tear of mesentery, 40 cm from ICJ, with gangrene of ileum for a length of 10cm with a 4x4 cm mesenteric hematoma (Figure 2). A resection and single layer ileal anastomosis was done. Post operative period was uneventful, he was started on orals on post-operative day 6 which was tolerated well. Patient is currently on follow up with Orthopedics for fixation of fracture dislocation of hip joint.

Figure I: CECT of small bowel mesenteric hematoma 2x1.8 cm suprapubic region.

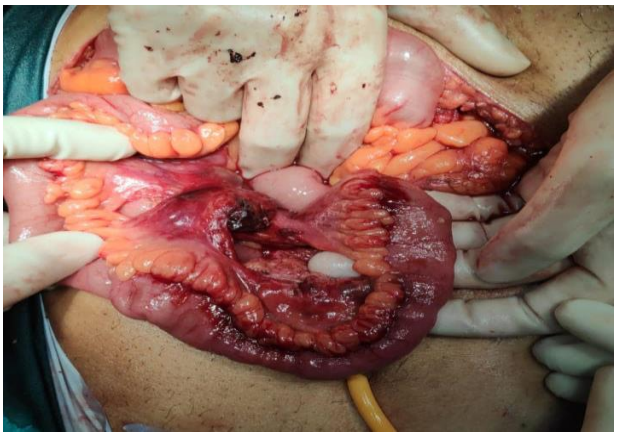

Figure 2: Intra-operative-bucket handle tear of mesentery with gangrene of ileum.

DISCUSSION

Bucket-handle tear is an injury where the mesentery avulses off a bowel loop that becomes devascularised, requiring emergency surgery.[4] The bowel loop in this case is known as the handle.

History of mode of injury and subsequently mechanism becomes of utmost importance. Commonly it is due to rapid deceleration in a road traffic accident (where seat belt restrain has been used). It can also occur in patients with fall from a height, a handlebar injury, or physical violence.[5]

In our patient it was a same level fall (SLF) with uncontrollable shift in centre of gravity due to high velocity deceleration injury (Figure 3). Clinical presentation is variable and nonspecific, as they can present with abdominal pain, only external bruising and very few present with frank signs of peritonitis.[5]

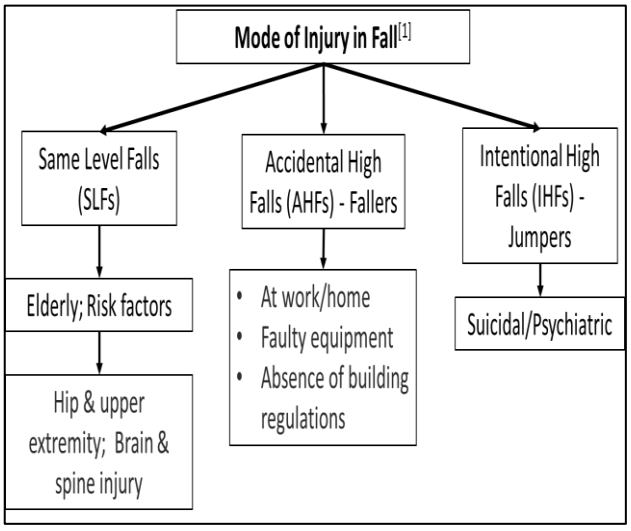

Figure 3: Classification and modes of injury in falls.

Pathophysiology of bucket handle injuries is due to shearing forces between segments of bowel fixed in the retroperitoneum and the more mobile peritoneal segments, such as proximal jejunum (Ligament of Treitz) and distal ileum (Ileo-caecal valve), similar to our patient who had a devascularising injury of ileum.[4,6] Case reports of bucket handle injuries of the transverse colon and sigmoid colon have also been reported.[7]

Biomechanical forces of mesenteric avulsion suggests that the degree of speed does not determine severity, but the degree of elongation of mesentery from the anatomic attachment.[8]

These injuries come under traumatic ischemic injury (Figure 4), which are associated with high incidence of delays in laparotomy due to difficulty in detecting it pre-operatively on CT which has a sensitivity 60%.[9,10] Definitive diagnosis is usually made only

intraoperatively, as was in our patient. CT findings such as mesenteric hematoma with active haemorrhage, bowel wall abnormalities including intramural hematoma or hypoenhancement, interloop fluid or blood sometimes gives clue.[11] The patient had an associated intra-peritoneal rupture of bladder and hence laparotomy was performed. Due to variable appearance of devascularised bowel on CT, sometimes non-bowel findings should raise a suspicion of devascularising injury of bowel such as associated pelvic fractures.[8] If missed at initial presentation, patients can patients will present 2-3 days later with peritonitis, sepsis, which increases morbidity and mortality.

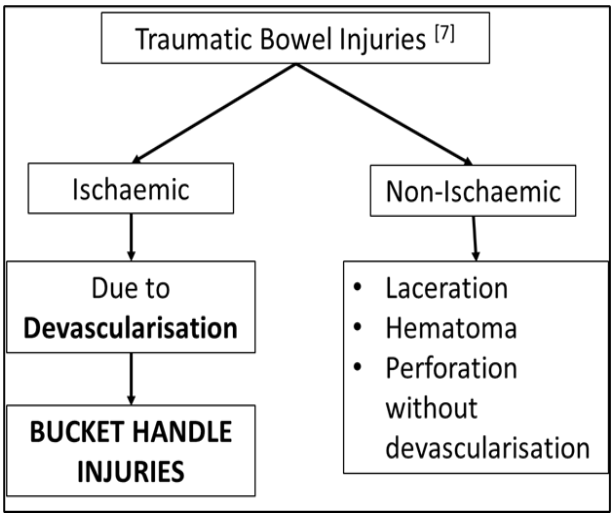

Figure 4: Classification of traumatic bowel injuries.

CONCLUSION

Bucket Handle Injuries of the small bowel are rare, but prompt diagnosis and surgical management is required to prevent delayed complications. Due to the varying CT findings, a pre-operative diagnosis is very challenging and required high index of suspicion. Mesenteric hematoma with active hemorrhage or bowel wall hematoma or hypoenhancement should give a clue on devascularising bowel injury.

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