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Rare Case of Isolated Intestinal Perforation in a Case of Penetrating Posterior Stab Wound to Gluteal Region: A Case Report

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Abstract: ***Over the past few years, the management of patients with penetrating abdominal has changed. Although the damage on a penetrating object/projectile is almost always evident. Occult injuries can be missed, resulting in delayed complications that can add to the morbidity. DPL (diagnostic peritoneal lavage) and FAST (focused assessment of ultrasound in trauma) can be performed to assess a stable patient with a penetrating wound, but both these modalities alone have a high rate of false negatives, unless combined with a triple phase CECT abdomen & pelvis. Here we report a case of penetrating trauma to abdomen via entry from lower posterior abdominal wall. This case is a reminder that any penetrating trauma close to abdomen with signs of peritonitis warrants high index of suspicion and the need for exploratory laparotomy can't be stressed enough in such cases, even though the chances of small/large bowel injury seem very low.***

Keywords: penetrating abdominal trauma, occult injury, diagnostic imaging, exploratory laparotomy, peritonitis suspicion

1. Introduction

Penetrating trauma occurs when a foreign object pierces the skin and enters the body creating a wound along its path. In blunt or non - penetrating trauma, the skin is not necessarily broken. In penetrating trauma, the object either remains in the tissue or passes through the tissues and may or may not exit the body. Any penetrating injury that passes through and exits a cavity, is termed a perforating injury.

Over the past few years, the management of patients with penetrating abdominal trauma has changed. Out of many causes, firearm injury and assault using a pointed structure (usually knife) stands to be the most common of them [1]. Even though most gunshot wounds typically have a linear projection, high - energy wounds are associated with unpredictable injuries. Most commonly injured organs are the small bowel (50%), large bowel (40%), liver (30%), and intra - abdominal vascular (25%) [2]. Stab wounds that penetrate the posterior abdominal wall are difficult to assess. Occult injuries can be missed, resulting in delayed complications that can add to the morbidity.

Penetrating trauma often causes damage to internal organs resulting in hemorrhagic shock. Others clinical findings include narrow pulse pressure, tachypnea, oliguria, and an apparent trajectory or open wound. Examination in awake patients may reveal signs of peritonitis such as guarding or rebound tenderness. The approach to patients with penetrating abdominal trauma depends on the type of instrument that caused the injury and hemodynamic status. In general, gunshots to the abdomen are usually associated with hollow viscus injury and usually require exploration. The use of DPL and FAST can be used as adjunct to assess the stable patient with a penetrating wound, but both these modalities individually have a high rate of false negatives and are highly operator dependant [3]. Even in FAST positive cases it's difficult to pinpoint the location of perforation or active bleed unless an accompanied triple contrast CT is done. Other imaging tests may be done tod assess for any associated head, thorax or skeletal injury. Previously, most gunshot patients required an exploratory laparotomy to rule out hollow viscus injury. This view is now changing, and stable patients with gunshot wounds with no signs of peritonitis who have been evaluated by a triple contrast CT scan may be kept under close observation [4]. In most tertiary care hospitals, penetrating trauma is handled by a distinct trained trauma team. The conventional indications for surgical intervention include (1) patient with hemodynamic instability, (2) development of peritoneal findings such as involuntary guarding, point tenderness or rebound tenderness, and (3) diffuse abdominal pain that progresses or doesn't resolve [5].

Patients with a stab wound with clear signs of peritonitis similarly require a laparotomy. Stable patients with stab wounds may be locally explored or undergo a triple contrast CT scan. In cases of hemorrhagic shock with non - responder status, principles of damage control laparotomy take over, which include (1) management of active bleeding, (2) quick identification of any serious injury, (3) rapid control of contamination, and (4) reconstruction when possible [4].

Depending on the injury, these patients often need some form of rehabilitation to reinstitute them back to their original level of function.

2. Case Description

In this paper we are reporting a case of penetrating injury to posterior abdomen. a 28 - year - old male presented to trauma emergency with h/o physical assault with a knife causing an entry wound over the left buttock. He had previous history of injectable drug abuse currently in rehabilitation. On primary survey, the patient had a regular pulse rate of 136/min. BP: 81/60mmHg, saturation of 98% on room air. eFAST was done and was found positive in pelvic region. Secondary survey revealed a 2cm incised wound over left buttock with no active discharge. On physical examination tenderness was present in whole abdomen with guarding and rigidity. The patient was initial resuscitated with 1L crystalloids via large bore peripheral IV cannula. CECT abdomen & pelvis was done which showed pneumoperitoneum and mild amount of free fluid in the pouch of Douglas. There is a communication between the peritoneal cavity and the posterior buttock region

at the site of the stab wound. Routine investigations were sent which revealed Hemoglobin of 13.5g/dl, Platelet count of 17100/mcl. WBC count of 3010/mcl on complete blood count. PT & INR of 17.4s & 1.63 respectively. Patient was viral marker positive for Hepatitis C virus (chemiluminescence assay for anti - HCV Antibodies). Patient was then taken for exploratory Laparotomy. Intraoperative findings were as follows - Abdomen opened with gush of air. Multiple mucus flakes noted in the peritoneal cavity. Large hematoma of 300mlevacuated from the pelvis. Perforation of 1*1cm seen in distal ileum 60cm from IC junction. Peritoneal tear of 5*5 cm seen in the recto - vesical pouch on the right side thorough which sacrum is palpable. Minimal bowel adhesions. After completing bowel walk maneuver, Rest of the bowel appeared to be normal.

Rest of slid organs appeared to be grossly normal. Stab wound 5*4cm seen in the right gluteal region, cavity deep. Stab extending deep in to the pelvis and connecting to the peritoneal cavity in recto vesical pouch on the right side. Primary closure of the perforation was done with Vicryl (Polyglactin 910) 3 - 0 round body in two layers – simple interrupted suturing. No perforations were seen in the rectum. And the peritoneal tear was repaired with Vicryl (Polyglactin 910) 3 - 0 round body in a single layer continuous suturing.22 No. Abdominal drain was placed in pelvis and the abdomen was closed in layers. Post operatively patient was started on empirical IV antibiotics. He was orally allowed on Post operative day 3. Drain was removed on post - operative day 4. Patient improved clinically & vitally and was discharged after 6 days of hospitalization.

3. Discussion

A penetrating injury to the posterior abdominal wall has features and presentation different from the classic penetrating injuries to anterior abdominal wall. Retroperitoneal organ injuries are common in such cases due to entry being from behind. But the uniqueness of our case was the entry point is much lower than posterior abdominal wall, entered via pelvis and injured small bowel while sparing all retroperitoneal structures and other pelvic organs.

The prognosis of patients with penetrating abdominal trauma is variable and depends on the extent of injury and time of presentation to the emergency department. In the presence of massive abdominal contamination from a perforated viscus, haemorrhage, multiorgan injury, associated head injury, or coagulopathy, the mortality rates are high [4]. In patients who are promptly resuscitated and explored, the mortality rates remain low. In our case, the patent was promptly resuscitated and investigated and taken up for exploration. Such quick decision making is needed to reduce door to OR time which is also known to be a predictor of mortality if delayed beyond a salvageable point [2].

The mortality rates from penetrating abdominal trauma ranges widely depending on multiple variables. Lowest mortality is in patients who sustain just a superficial injury to the abdominal wall & in cases of peritoneal breech with classical Virchow's triad of death, the mortality rates are nearly 50% [3]. The majority of deaths occur within the first 24 hours of injury. Risk factors that predict mortality include female gender, the presence of shock on arrival, delay in treatment, and associated head injury. Firearms are usually associated with much higher morbidity and mortality compared to knife wounds [1].

4. Conclusion

This case demonstrates that injury to the posterior abdomen region causing peritoneal tear can injure small intestine without causing any injury to adjacent structures, including rectum. So, the injuries to the buttock region with abdominal tenderness and other classic signs of peritonitis need to undergo exploratory laparotomy.

References

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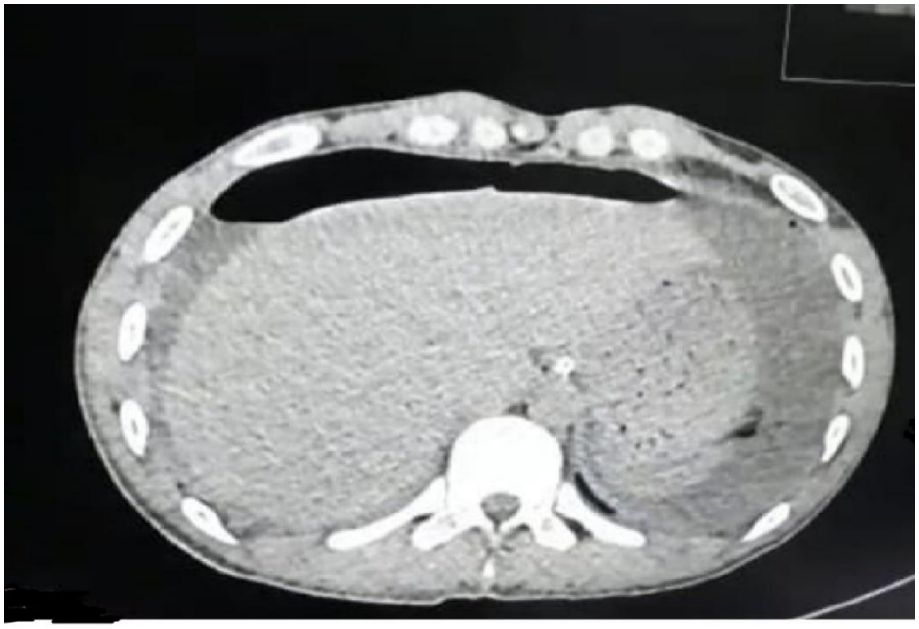

Figure 1: NCCT abdomen image depicting pneumoperitoneum

Figure 3: Preoperative entry wound over right gluteal region

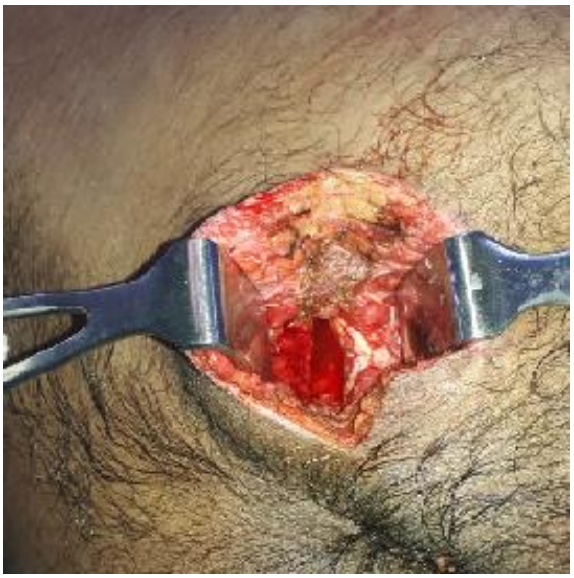

Figure 4: Wound communicating with pelvic cavity

Figure 5: Intraoperative image depicting perforation over antemesenteric border of distal ileum

Figure 6: Primary repair of perforation done with 2 layered interrupted approach with Polyglactin