



## ISOLATED TRAUMATIC DUODENAL PERFORATION CLOSED OVER ROUX EN Y SIDE TO SIDE DUODENOJEJUNOSTOMY WITH JEJUNOJEJUNOSTOMY: AN UNUSUAL CASE REPORT

### General Surgery

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### ABSTRACT

**Introduction:** Blunt trauma abdomen are cases frequently encountered by surgeons in the Emergency department. The abdomen is a commonly injured body region and frequently requires the care of a surgeon for definitive management. Blunt injuries of the small bowel are less common, present in 1.7% of all blunt abdominal injuries in the NTBD, although these injuries are associated with a significant mortality rate of 14%<sup>1</sup>. Isolated Duodenal injury following blunt abdominal trauma is rare and it usually seen with other abdominal organ injuries.

**Observation:** This case presents a case of a 14 year old male with blunt trauma to abdomen with bicycle handle came to Emergency department 2 hours after injury with chief complaints of severe abdominal pain. Contrast Enhanced CT was suggestive of significant pneumoretroperitoneum. Decision for a laparotomy was taken and duodenal perforation identified, which was repaired by a side to side retro colic Roux En Y Duodenojejunostomy.

**Conclusion:** Bicycle handle injuries and blunt traumatic injuries to abdomen are very frequent and decision for a surgical intervention or a conservative management is always based on the basis of radiological and clinical findings. Such cases should be handled on a greater priority basis and decision should not be delayed only on clinical findings. Blunt trauma abdomen should always be handled as a surgical emergency and not delayed for signs of sepsis.

### KEYWORDS:

Blunt trauma abdomen, Isolated duodenal perforation, paediatric trauma

### INTRODUCTION

Duodenal injuries are rare in pediatric population, and isolated duodenal perforation is even rarely reported. Isolated involvement of duodenum is rare because of its retroperitoneal location. Since most of the children with blunt trauma are managed conservatively, timely diagnosis is imperative to avoid morbidity and mortality. The mechanism of injury may be associated with flexion/distraction fracture of L1&L2 vertebrae (the Chance fracture). 'Stomping' and striking the mid-epigastrium are common. Less commonly, deceleration may produce a tear at the junction of the third and fourth parts of the duodenum, and tears of the first and second parts of duodenum. These injuries occur at the junction of anterior (intraperitoneal) parts of the duodenum with fixed (retroperitoneal) parts. [2] In the present report the injury might have occurred due to compression of duodenum posteriorly to vertical column laterally. Blunt injuries of the small bowel are less common, present in 1.7% of all blunt abdominal injuries in the NTBD, although these injuries are associated with a significant mortality rate of 14%<sup>1</sup>. This report presents a case of a young male with alleged history of bicycle handle injury causing Blunt Trauma Abdomen came to the emergency department with no features suggestive of peritonitis, diagnosed on Contrast Enhanced CT Abdomen to have an isolated duodenal perforation taken for emergency laparotomy and managed further.

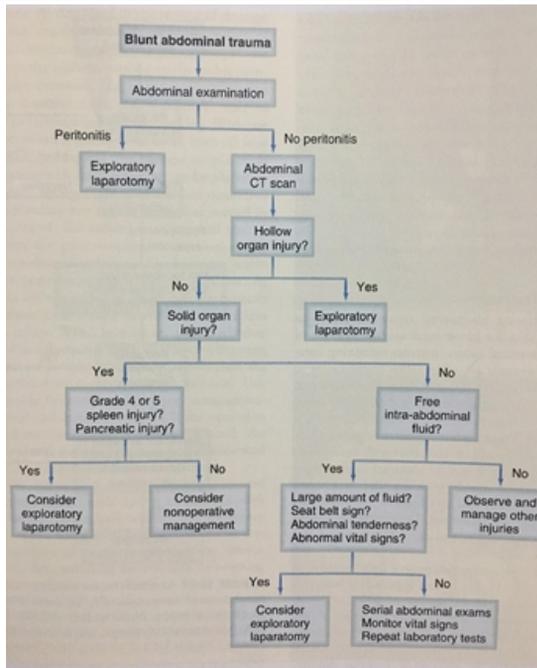
### CASE REPORT

A 14 year old male with blunt trauma to abdomen by cycle handle came to Emergency department 2 hours after injury with chief complaints of severe abdominal pain. Patient was riding a bicycle when he collided with a motorbike and was hit by the handle of his bicycle on the right side of abdomen. Patient has severe pain generalized over abdomen, referred to back, aggravated on movement and relieved with medications. Pain was associated with vomiting 2 episodes, around 20-30ml contained food particles, non-bilious, no blood in vomitus. On examination, the child was conscious and alert, lying comfortably on bed, with stable hemodynamic status. Per abdomen examination, on inspection the abdomen was scaphoid, central inverted umbilicus. On

palpation, there was generalized tenderness (all quadrants) with no guarding or rigidity. No distension, no hepatosplenomegaly. No features of ascites were present. On auscultation bowel sounds were absent. On per rectal examination no abnormality detected. The hemogram was suggestive of **Hb**-11.00 gm/dl, **WbC**- 16,000, **plt** - 2,10,000. Biochemical investigations Liver function test and Renal function test were in normal limit. **CT findings** - Significant air foci seen in peritoneum in right iliac, (Fig.1, 2) right lumbar and right hypochondrium suggestive of pneumoretroperitoneum. Pancreas-pancreatic body and tail is oedematous and appear hypodense (bulky). Patient was hemodynamic status but in view of pneumoretroperitoneum decision for laparotomy was taken. A midline laparotomy incision was given. Abdomen explored. No free fluid or blood in abdomen. Liver and Spleen appeared normal. Bowel appeared normal, no perforation. Mesentery appeared normal. A bulge was seen from the retroperitoneum just superior to hepatic flexor. Duodeno-colic ligament was opened, minimal bile and lot of free air escaped. A large perforation 3cm longitudinally found on the lateral wall of 2<sup>nd</sup> part of duodenum. (Fig.3) Side to side retrocolic Roux En Y Duodenojejunostomy with end to side jejunojejunostomy done.

### DISCUSSION

In cases of blunt trauma abdomen, solid organs often sustain contusion or laceration, causing bleeding or can rupture hollow viscera due to rapid compression of a segment of intestine containing fluid and air. Within the 2012 NTDB (National Trauma Data Bank), 14.8% of all patients sustaining abdominal injuries, with penetrating mechanisms being proportionately greater than blunt (23.8% versus 12.1%)<sup>1</sup>. Patients who are unstable and have intra-abdominal fluid identified on FAST require an emergent laparotomy to manage bleeding<sup>3</sup>. If FAST is not available then a diagnostic peritoneal lavage revealing 10ml or more of gross blood suggests an intra-abdominal source of shock and require emergency laparotomy. The presence of peritonitis is also an indication for immediate laparotomy. The evaluation of blunt trauma abdomen is shown in the flow chart below<sup>1</sup>.



The blunt injuries of the small bowel are less common, present in 1.7% of all blunt abdominal injuries in the NTDB<sup>1</sup>. Duodenal injuries present a significant challenge for trauma management because of the proximity of the major vascular structures including the aorta, vena cava, and portal vein, injury to the duodenum can be associated with profuse hemorrhage. When patients are being observed following trauma, the following clinical symptoms and signs may suggest an undiagnosed duodenal injury:

- Increasing abdominal tenderness
- Recurrent vomiting or inability to tolerate oral diet
- Unexplained hypotension
- Increasing leucocytosis/Decreasing haemoglobin
- Proximal small bowel obstruction
- Peritonitis

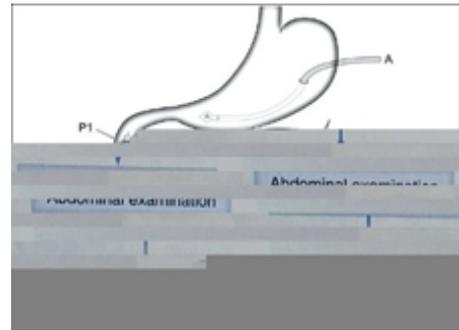
A diagnosis of duodenal injury is made by computed tomography (CT) of the abdomen or exploratory laparotomy, as indicated by the clinical findings. Duodenal wall thickening, peri-duodenal fluid, fluid in the right anterior pararenal space, diminished enhancement of the injured duodenal wall segment, and the "sentinel clot" sign<sup>4</sup>, which is a highly attenuating, heterogeneous fluid accumulation near the site of injury, extraluminal air or extraluminal contrast indicate duodenal perforation. Duodenal traumatic perforation are classified on basis of severity of injury, most widely used classification is from the American Association for the Surgery of Trauma (AAST). The severity of injury is estimated based upon findings of computed tomography or during operative exploration as

- Grade I: Hematoma involving a single portion of duodenum or partial thickness laceration without perforation
- Grade II: Hematoma involving more than one portion or disruption <50 percent circumference or major laceration without duct injury or tissue loss
- Grade III: Laceration with disruption of 50 to 75 percent circumference of 2nd portion or disruption of 50 to 100 percent circumference of 1st, 3rd, 4th portion
- Grade IV: Laceration with disruption >75 percent circumference of 2nd portion or involving ampulla or distal common bile duct
- Grade V: Massive laceration with disruption of duodenopancreatic complex or devascularisation of duodenum.<sup>5</sup>

There are several options to deal with duodenal injury, which range from simple repair like primary closure (duodenorrhaphy) to more complex procedures like resection and anastomosis, duodenal diverticulation, pyloric exclusion, pancreaticoduodenectomy. However, no single method of repair completely eliminates the possibility of a duodenal fistula.<sup>7</sup>

Repair of duodenal perforation can be done based on position and severity of perforation:

1. A perforation repaired in two layers and a triple tube decompression, i.e. tube gastrostomy, reverse tube duodenostomy and a feeding jejunostomy, was performed. An abdominal mesh drain was placed in the paraduodenal area and a polypropylene mesh laparostomy was done.



Graphical representation of the triple tube decompression technique (case 1) (A = tube gastrostomy, B = retrograde tube duodenostomy, C = feeding jejunostomy, P1 = site of the perforation on the anterior wall of the duodenum, P2 = site of the perforation)

2. There was a perforation in the second part of the duodenum involving more than 50% of the circumference. Duodenorrhaphy was done in two layers with 3-0 vicryl and silk sutures. A tube gastrostomy, reverse tube duodenostomy through the proximal jejunum, and a feeding jejunostomy and polypropylene mesh laparostomy were performed.<sup>6</sup>

While in our case, a large perforation 3cm longitudinally found on the lateral wall of 2nd part of duodenum, was managed by a side to side retrocolic Roux En Y Duodenojejunostomy with end to side jejunojejunostomy.

## CONCLUSION

Since most of the children with BTA are managed conservatively, presence of clinical indicators like upper abdominal pain, vomiting, and raised leukocyte count & high index of suspicion should prompt an early CECT of the abdomen followed early exploratory laparotomy and repair of perforation, as delay in these cases can be fatal to life of the patient.

## DECLARATIONS

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