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Research Paper

A Study of 10 Cases of Duodenal Injury After Blunt Abdominal Trauma Managed by Triple Tube Method

Medical Science

KEYWORDS : duodenal injury, blunt abdominal trauma, triple tube

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ABSTRACT

Duodenal injuries are found in only 3-5% laparotomies for blunt or penetrating abdominal trauma. Delay in diagnosis due to late clinical presentation, subtle diagnostic findings, incorrect classification of the injury leads to increased morbidity and mortality. We retrospectively analysed 10 consecutive patients diagnosed with traumatic duodenal injuries over 4 years. In that 10 patients, majority of them were of21 – 40 years and 40 % were in shock at the time of presentation. 6 patients were patients were preoperatively diagnosed, and 4 were diagnosed intra-operatively. All the patients underwent triple tube decompression with primary repair of injury. Only 1 patient with head injury died rest all were survived and discharged successively.

Summary:

Triple tube decompression with primary repair is an effective alternative in unstable, non-complex duodenal injury patients.

Introduction:

Isolated blunt duodenal injury is a rare finding associated with high morbidity and significant mortality. The early identification of a duodenal injury is usually difficult, considering the anatomical location of the duodenum and lack of peritoneal signs and diagnostic delay is part of the clinical picture in most cases. In this study, we retrospectively analyzed our experience with blunt duodenal injuries and investigated the value of triple tube decompression method.

Patients and method

Between January 2008 and December 2012, 10 patients with duodenal injuries were treated at the Department of Surgery, PDU Medical College and hospitals, Rajkot. The definitive diagnosis of duodenal injury was obtained by preoperative imaging in 6 and at laparotomy in 4 patients. All data were collected from hospital patients' records retrospectively which includes age, sex, grade of duodenal injury, number and size of lesions, anatomic location of duodenal injury, associated abdominal organ injuries and presence and type of complications and mortality. After aggressive resuscitative measures, the first step in laparotomy is kocherization of the duodenum, in order to observe the perforated site carefully and to decrease any tension at the repair site. After adequately mobilizing the duodenum, the next step is the closure of the duodenal perforated site by suturing with 1–2 layers. In the setting of chronic inflammation, we add the patch using omentum or intestinal serosa. The next step is identification of the jejunum 5–15 cm distal to the Treitz ligament, and passage of a tube through an antimesentericenterotomy in a retrograde manner into the junction of the second and third portion of the duodenum. The tubing into the duodenum allows it to be decompressed. In the final step, as a feeding jejunostomy nasogastric tube was inserted.Per operatively duodenal injuries were classified into grade I to V duodenal organ injury scale (DIS) according to AAST. Mortality was defined as in-hospital death and none of the patient died after discharge from the hospital on follow up for 1 year.

Fig:1- Grade III duodenal injury

Grade	Type	Description
I	Hematoma Laceration	Single portion Partial thickness
II	Hematoma Laceration	>1 portion Disruption < 50% circum.
III	Laceration	Disruption 50-75% of D2 circumference or 50-100% of D1,3,4
IV	Laceration	Disruption >75% circumference D2 Ampulla, Distal CBD
V	Laceration Vascular	Complex Pancreaticoduodenal Devascularisation

Table – 1: Grading of injury (AAST)

	No. of patients
Gender (M:F)	4:1
Age	21-40yrs
Shock at admission	5
Duodenal injury (I/II/III/IV/V)	0/2/7/1/0
Isolated duodenal injury	4
Duodenum + other organ injury	6

Table – 2:Patients' demographics and injury characteristics

Results:
During a 4 year period, we reported 10 cases of blunt duodenal trauma at our institute. According to the mode of trauma, the duodenal injury was due to road traffic accidents (7) and falls from high places (2) and other blunt trauma (1). Predictably, the patients were mostly young with an average age of 30 years (range 21-45 years). There was a male predominance, with 8males (80%) and 2 females (20%). 4 patients (40%) had hemorrhagic shock on first admission to the emergency room. All cases presented after 12 hours of injury except two. 6 patients were preoperatively diagnosed, and 4 were diagnosed intra-operatively. In the group, 4 patients (40%) had isolated duodenal injuries while 6 with other abdominal organs, head or skeletal injury. The most commonly associated injured organ was the liver (in 3 patients), with other injured organs being the kidney in 1 patient, spleen in 1 patient and pancreas in 1 patient. The clinical data of the patients, according to the grade of duodenal injury severity (DIS) and the mechanisms and anatomic localization of the injury are presented in Table 2. Abdominal drains were used in all patients and the drains were primarily placed in the subhepatic orperiduodenal space through another clean stab wound. Most of the patients had grade III (7 patients, 70%) or II (2 patients, 20%) duodenal injuries. The major morbidity causes were abdominal abscess, duodenal fistula, and wound infection. 1 out of 10 patients died postoperatively within 24 hrs of operation.

Discussion:
The relatively low frequency of duodenal trauma compared to injuries of other abdominal organs and the high probability of the development of causes of morbidity such as fistula formation and sepsis after its repair has made this entity a challenging problem. We report the experience of our Tertiary care center with 10 duodenal injuries after blunt abdominal trauma. Isolated blunt duodenal injury is very rare accounting for 2-3% only.Associated organ injury is almost always present.Delay in diagnosis is more obvious due to late clinical presentation and subtle diagnostic findings. Intra operative dilemmas due to retroperitoneal location of the duodenum, its proximity to important abdominal structures and its marginal blood supply makes it more complicated.

All three cases of duodenal perforation that we treated using triple-tube method showed a very good postoperative course. The patients resumed a scheduled diet within 10 days after the operation and were discharged within 20–25 days. We believe that the good postoperative outcome is due to simple principle of the technique of duodenum decompression for the closure of the perforated point, and jejunostomy for early enteral nutrition. Involvement of a feedingjejunostomy, enables early enteral nutrition that may well have a positive effect on immune function and nourishment status. Additional factors that contribute to the success of this procedure are proper kocherization of the duodenum (which ensures tension-free repair) and good-sized retrograde duodenostomy that is placed at the junction of the second and third portion of the duodenum. Thus, the procedure relies mainly on keeping the duodenum empty and tension-free by decompressing all of the fluids that either enter in, or are secreted from, the region. Majority of our patients were of grade II or III duodenal injury it was therefore primary repair with triple tube decompression was successful. But in case of more severe injuries it may require complex repairs.

Regarding the mortality of one patient, delay in the diagnosis, associated head injury late presentation, and shock at the time of presentation may be the causes.

Conclusion
Duodenal injuries after blunt abdominal trauma is difficult to diagnose particularly isolated ones. Triple tube decompression is a safe and effective alternative for grade II and III patients with delayed presentation and patient is unstable.

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