

Isolated Duodenal Perforation at D3 Following Blunt Abdominal Trauma, a Challenging Diagnosis and Management: A Case Report

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Abstract

Case Report

Introduction: Isolated duodenal rupture following blunt abdominal trauma is rare. We here report a case of isolated duodenal perforation treated by suture, pyloric exclusion and side-to-side gastrojejunostomy in order to discuss its diagnostic, therapeutic, and evolutionary features. **Observation:** A 46-year-old man, victim of a physical aggression, consulted ten hours after the trauma for diffuse abdominal pain associated with vomiting. The physical examination revealed a febrile patient at 38.2°C, hemodynamically stable with generalized abdominal defense. The abdominal CT revealed parietal defect of the 3rd duodenum (D3), pneumoperitoneum, intra and retroperitoneal fluid effusion without adjacent organ involvement. The patient underwent emergency surgery. Intraoperatively, a centimetric perforation of D3 on the anterior wall was found. The lacerated edges were repaired with interrupted sutures. A pyloric exclusion and side-to-side gastrojejunostomy are performed. Postoperative course of patient was unremarkable. Isolated duodenal injuries are rarer in blunt abdominal trauma because the duodenum is located in a deep anatomical position. Duodenal injuries secondary to blunt trauma can range in severity from intramural hematoma to a complete transection and devascularization of the duodenum. There is no consensus on the surgical procedure. Options range from primary suture to complex duodenopancreatic resections based on the severity of the lesions. **Conclusion:** Isolated duodenal trauma is unusual following blunt trauma. Prompt diagnosis and management is the key to prevent morbidity and mortality.

Keywords: Blunt abdominal trauma, Peritonitis, Duodenal wound.

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INTRODUCTION

Isolated duodenal rupture following blunt abdominal trauma represents less than 20% of patients with blunt abdominal trauma that occur after blows to the upper abdomen, or abdominal compression [1].

Forty percent of patients with duodenal injuries have other concomitant intra-abdominal injuries, such as hepatic or pancreatic injuries [2].

Patients with concomitant lesions have a lower likelihood of morbidity and mortality, as the associated lesions prompt the surgeon to intervene more rapidly than if single lesions initially present with clinical signs. The subtle signs may go unnoticed unless the surgeon has a high index of suspicion and is aware of the mechanism of trauma that may cause duodenal injury [3].

Computed tomography is the primary means of investigation in blunt abdominal trauma. However, if

the CT scan is performed too soon after the injury, it may be negative for isolated duodenal injury.

There is no consensus on the surgical procedure. Options range from primary suture to complex duodenopancreatic resections based on the severity of the lesions [4].

We here report a case of isolated duodenal perforation treated by suture, pyloric exclusion and side-to-side gastrojejunostomy in order to discuss its diagnostic, therapeutic, and evolutionary features.

CASE PRESENTATION

A 46-year-old man, victim of a physical aggression: direct shock to the epigastric area by a knee blow. He consulted ten hours after the trauma for diffuse abdominal pain associated with vomiting.

The physical examination revealed a febrile patient at 38.2°C, hemodynamically stable with generalized abdominal defense.

Laboratory investigations showed: white cell count of $11.7 \times 10^9/l$, CRP at 160 mg/L and normal serum lipase.

The abdominal CT revealed parietal defect of the 3rd duodenum (D3), pneumoperitoneum, intra and retroperitoneal fluid effusion without adjacent organ involvement (Figure 1).



Figure 1: Abdominal CT scan showing parietal defect of the 3rd duodenum

Emergency surgery was indicated.

Intraoperatively, a centimetric perforation of D3 on the anterior wall was found. No associated injuries of adjacent organs (Figure 2). The perforation

was repaired with interrupted sutures at PDS 4/0. A pyloric exclusion and side-to-side gastrojejunostomy are performed. An intra-abdominal drain was left in front of the sutures.

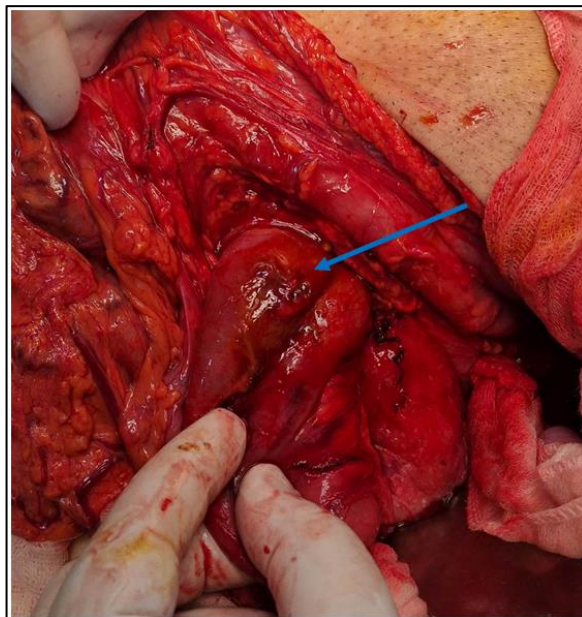


Figure 2: Duodenal perforation on the anterior wall of D3 (blue arrow)

Postoperative course was unremarkable. He was oral fluids on 4th postoperative day. The drain was removed on 5th postoperative day.

DISCUSSION

The duodenum is situated in the retroperitoneal space and is divided into four sections (D1–D4). Commonly, injuries occur at the junction between D1 and D2 or at the junction between D3 and D4 [5]. Duodenal rupture following blunt abdominal trauma are commonly associated with injuries of adjacent organs.

Isolated duodenal injuries are rare in blunt abdominal trauma because the duodenum is located in a deep anatomical position. D3 ruptures accounted for 17% [6].

Duodenal injuries secondary to blunt trauma can be classified into 5 grades according to the American Association for the Surgery of Trauma, ranging from intramural hematoma to a complete transection and devascularization of the duodenum. Our patient had grade II duodenal injury.

The surgical management of duodenal injuries depends on 4 factors: the distance between the duodenal lesion and the ampulla of Vater, the severity of injury, the circumference of the duodenum involved, and the associated biliopancreatic or vascular injuries.

Computed tomography allows the diagnosis of duodenal injuries and an assessment of associated lesions [8].

The mobilization of the duodenum should be performed to allow full examination of the duodenum [9].

There are several methods of repairing duodenal ruptures, depending on the severity of the injury: ranging from simple duodenorrhaphy to complex procedures such as resection-anastomosis, duodenal diverticulation, pyloric exclusion, and pancreaticoduodenectomy.

Primary repair of duodenal lacerations can be performed successfully in approximately 80% of cases [10].

It is relatively easier to repair the first, third, and fourth parts of the duodenum after its Kocherization. More advanced procedures are required for reconstruction of D2, where a considerable amount of duodenal tissue is lost.

The fully transposed D1 requires antrectomy, duodenal stump closure, and gastrojejunostomy [11].

A drainage system opposite the duodenal repair is useful for the diagnosis of suture leakage and subsequent monitoring.

Many methods have been used to reduce the risk of leakage from the duodenal repair. The primary purpose is to divert gastric flow. These procedures include antrectomy, vagotomy, duodenal diverticulization, duodenal exclusion and gastrojejunostomy [12].

CONCLUSION

Isolated duodenal rupture is exceptional after blunt trauma. Clinical diagnosis is often difficult. A CT scan should be performed in suspected cases of blunt epigastric trauma to exclude injury to the duodeno-pancreatic block.

Primary repair of duodenal wounds is sufficient, provided that expertise is available.

Prompt diagnosis and management are essential to decrease morbidity and mortality.

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