Case Report

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Duodeno (D2)-Gastrostomy in Grade III Duodenal Injury: A Rare Case Report

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Abstract

Duodenal injuries constitute around 5% of all abdominal traumas duodenal injuries associated with the highest mortality and morbidity rate because of their complex anatomy. Duodenal injuries managed surgically with adjuncts like pyloric exclusion and triple tube diversion, though primary repair still an option for low-grade injuries. In our case, where a 14-year-old boy with grade 3 duodenal injury has been managed with direct repair with duodeno-gastrostomy and without postoperative complications D2 Gastrostomy is a good option in high-grade D1 and Proximal D2 injuries. Even if the procedure fails, you will remains have more options for reconstruction. Though there is insufficient data available to recommend the treatment of choice, hemodynamic stability and rich vascular supply remains the mainstay of guiding management in these patients.

Keywords: Blunt trauma; Duodenal injuries; AAST grading; Primary repair; D2 Gastrostomy

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Introduction

Duodenal injuries contribute to 4.7% of all abdominal traumas [1] and around 1.5%-11% of all trauma laparotomies [2]. Many surgeries have been described in the literature right from the primary repair to various adjuncts to prevent postoperative complications, mainly duodenal leak from the sutured site, thus thereby decreasing further morbidities and mortality. We are reporting a case of Grade 3 duodenal injury, successfully treated Duodena (D2)-gastrostomy. The primary repair of low-grade duodenal injuries has already been proven to be associated with less complication and successful outcomes.

Case Study

A case of a 14-year-old boy with a delayed presentation 12 hours of an alleged history of fall over a stone while playing over his abdomen. The patient was managed according to ATLS protocol, and on the primary survey, he was in Grade 2 haemorrhagic shock with FAST positive status in the hepatorenal and splenorenal area. However, rest of the findings were within normal limits. On further evaluation, he had diffuse abdominal tenderness without any signs of external injury. CECT showed pneumo-retroperitoneum (around the second part of the duodenum) and moderate blood in the peritoneal cavity. Surgical intervention was planned after the initial management.

Surgical intervention

On Exploration, 90% circumferential loss of D1 and proximal D2 (1 cm proximal to the opening of Ampulla of Vater) with complete transection of the pylorus and around 300 ml of bilio-sanguineous fluid was drained **(Figure 1)**. There was no injury to the pancreas, and the ampulla was intact; the bowel was healthy. The bile duct, inferior vena cava, hepatic artery and bile duct were intact. Transected end of pylorus was freshened and closed with Polydioxanone 3-0 suture along with that resection of lacerated segment of D1 and part of D2 was done. End to end anastomosis of the remaining D2 segment (2nd part of duodenum) was done with stomach posterior surface using polydioxanone 3-0 interrupted suture **(Figure 2)**. In order to prevent anastomosis leak, Ryle's tube was placed in the duodenum across the anastomosis, and feeding jejunostomy (FJ) was performed. The patient was kept under monitoring, and feeding was allowed via FJ on postoperative day 2 (POD 2) with oral sips from POD7, with finally Ryle's tube and drain removed on POD 12. The patient was allowed orally after then, and no episodes of vomiting and pain in the abdomen, fever episodes happened. He was discharged on a complete oral diet and was called for follow up after one week. On his follow up visit after three weeks, we did Barium Meal Follow Through to see the continuity and site of surgery for narrowing **(Figure 2)**. The patient was followed on four weeks, 12 weeks and then six months; he is comfortable, mobile and accepting regular oral diets.

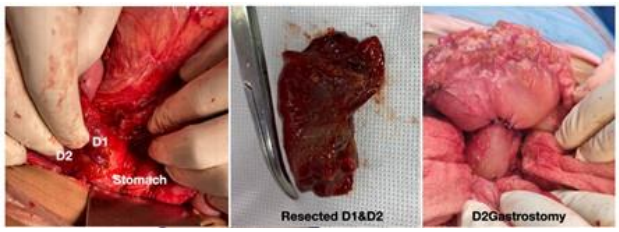

Figure 1: (A) Intra-operative finding- showing D1 and D2 laceration (B) Resected segment of D1 and Proximal D2 (C) Posterior D2 Gastrostomy.

Figure 2: (A) Child after 6 months of follow-up (B) Normal upper GI Gastro-graffin study.

Discussion

Isolated injuries to the duodenum and pancreas are rare and are usually associated with other significant abdominal injuries [3]. Hemodynamic stability act as an important factor to decide operative or non-operative management of duodenal injuries. In critically injured patients, damage control surgeries are most important; however, the amount of tissue loss and associated pancreatic injury is the most crucial determinant [4]. Many surgical procedures have been described in the literature. Due to excellent blood supply, the primary repair is the feasible option in grade 1 and 2 injuries and jejunal serosal patch, has also been described [5]. Various adjunctive procedures are also there to decrease duodenal leak, with the first being pyloric exclusion with gastrojejunostomy by Albert [6]. Stone and Fabian in 1979 described the method of triple-tube diversion with duodenal diversion with gastrostomy, a retrograde duodenostomy, and a feeding jejunostomy after primary repair [7] and Berne described the duodenal diverticulisation technique in 1974 [8].

Thus, considering duodenal rich vascular supply, we performed a kind of local repair inpatient with Grade IV duodenal injury with >75% lumen disruption of D2. The local repair consists of pyloric exclusion with side to end gastroduodenostomy and Ryle's tube beyond the anastomotic site as well as feeding jejunostomy. The reason to take this decision on the operating table, even though such a procedure has not been described in the literature, was to kept the option of doing the formal gastrojejunostomy and duodenojejunostomy in case any post-op leak occurs. However, the patient had no post-operative complication, and no evidence of a leak was there. The follow-up barium study also did not suggest any leak, with the pyloric ring remaining closed and well-functioning stoma.

The primary repair of low-grade duodenal injuries has already been proven to be associated with less complication and successful outcomes [9]. Thus, a local repair of duodenal injury in high-grade duodenal injuries can also be a good option in a few selected cases.

We suggest the local repair of Grade 4 duodenal injuries without involving ampulla may be considered a surgical option and thus preventing extensive surgery like duodenojejunostomy and gastrojejunostomy also maintaining the normal anatomy to some extent [10].

Conclusion

Our case reports successful duodenogastrostomy of Grade 3 duodenal injury without postoperative complications. Though the procedure mentioned above not reported yet for such injuries. Due to the stomach's rich vascular supply, duodenogastrostomy may be the better and simple procedure over complex roux- en- reconstruction. As the duodenum is very notorious and well known for the leak after anastomosis, we could consider that if primary surgery fails, the patient still has other reconstruction options like Roux-en-Y jejunum reconstruction. The author suggests D2-Gastrostomy in case of D1 or D2 injury sparing ampulla could be an option of reconstruction with keeping other options open, in case failure will further increase the chance of survival in duodenal injury.

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