



“TWO-TUBE OSTOMY”- A NOVEL TECHNIQUE FOR SURGICAL MANAGEMENT OF POST ERCP DUODENAL PERFORATION

General Surgery

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ABSTRACT

Large duodenal perforations are difficult to treat and are an uncommon consequence after medical treatments (ERCP). We provide a novel approach to treating this perforation called "Two-Tube-Ostomy," which combines feeding jejunostomy and tube gastroduodenostomy. The method addresses issues with minimum post-operative complications, early enteral feeding, biliary diversion and primary suture line protection, particularly in patients who are unstable and comorbid. It is simple to Perform with low morbidity.

KEYWORDS

Duodenal Perforation, ERCP, Tube Gastroduodenostomy, feeding jejunostomy, two tube ostomy

INTRODUCTION

Surgeon's face significant difficulty when handling duodenal perforations, as improper management can have disastrous consequences. Due to the duodenum's retroperitoneal position, which causes mild symptoms and the absence of peritonism in its early stages, duodenal injuries are difficult to diagnose and treat. Furthermore, their presentation is more than 24 hours late. Duodenal injuries have two primary causes. Primary cause being traumatic injuries (blunt and penetrating, with the latter accounting for over 80% of all) (1). Iatrogenic trauma, which can happen during surgery or procedures like endoscopic retrograde cholangiopancreatography (ERCP) and endo ultrasonography, is the second cause of duodenal injury. Post ERCP most retroperitoneal perforation are small and managed conservatively. Lateral perforation or large perforation causes peritonitis and require surgical intervention.

Thus, in this paper, we present a simple, easy-to-learn, and perform two-tube-ostomy technique which was done for a iatrogenic duodenal perforation post ERCP procedure.

Technical Note:

The midline laparotomy incision provided access to the abdominal cavity. Duodenum was inspected and the perforation site was identified. The margins of perforation were devitalised and the surroundings were inspected. A small gastrostomy (near antrum of the stomach, healthy non-inflamed tissue) was done and Ryle's tube no.18 was passed through it into the duodenum across the perforation into the distal duodenum for biliary diversion and protection of primary closure. Feeding jejunostomy was done for early enteral nutrition. The stomach was fixed to the anterior abdominal wall near the gastrostomy site.

Case Report

An 80-year-old female was admitted to our hospital with a complaint of pain in her upper abdomen this morning. The patient went through an ERCP procedure in the morning for a lower CBD stone but the procedure was abandoned because of the possibility of deep. duodenal mucosal injury (retroduodenal perforation). The procedure was abandoned without placing the stent. She had a known case of hypertension (on regular medication) and was non-diabetic. Vitrally she was afebrile, Pulse-78/min, BP-110/70 mmhg, spo2-98% on RA. On Abdominal examination, there was tenderness over the epigastric, right hypochondriac region without distention. Her HB was 11.1gm/dl, WBC- 12,290/cmm, platelet- 231,000/cmm, S. creat-1.38 mg/dl. We did a contrast-enhanced CT scan of the Abdomen and pelvis to evaluate the details of perforation. CT showed a leak of orally administered contrast along the lateral wall of the D2 portion of the duodenum tracking into the posterior perinephric space with thickening of Gerota's fascia with mild pneumoperitoneum. Meanwhile, the Patient developed generalized abdominal guarding and her blood pressure dropped. So, we planned for Emergency

Laparoscopic lavage with Gastroduodenostomy and Feeding Jejunostomy. So, feeding was started through FJ and the rest post-op time was uneventful. The patient recovered well and was discharged with FJ and a gastroduodenostomy tube. Tubes were removed 6 weeks after the procedure.

DISCUSSION

There are numerous digestive enzymes in the duodenum, particularly near the distal side of the papilla of Vater (bile, pancreatic juice, and gastric juice). Pancreatic juice and bile combine to improve the digestive system. The location of the perforation is crucial in cases of duodenal perforation. High-grade oedema and inflammation will result from intestinal fluid leakage from the perforated area, including bile and pancreatic juice, which will harm the surrounding tissues. Serious side effects from postponing therapy could include sepsis, retroperitoneal abscess, and anastomotic leaking(2).

Four categories are used to categorize duodenal injuries resulting from endoscopic diagnosis and therapeutic intervention. The mechanism of injury and anatomical location of the injury influence the treatment strategy. Type 1 is an endoscopically-caused lateral or medial wall perforation that typically necessitates emergency surgery. A perivaterian perforation is the second type; it is more discrete and has fewer chances of a surgical intervention requirement. The third type consists of damage to the bile duct caused by instrumentation close to an obstruction. The fourth type, which is not regarded as true perforation, is characterized by retroperitoneal air alone and is most likely connected to the usage of compressed air (3). No method can remove the possibility of suture dehiscence. Redirecting the intestinal products from the anastomosis is one technique to lessen this problem and by utilizing our two-tube ostomy technique, both the above problems can be easily dealt with.

The probability of a tension-free closure is dependent upon the timing of the diagnosis in all forms of duodenal injury. A primary closure is probably not appropriate for perforations discovered after 24-36 hours because of the localized peritonitis. Even for complex injuries, there is ongoing debate on the best course of therapy. To prevent postoperative leakage, which is the primary cause of increased morbidity and mortality, additional measures have also been reported for strengthening the suture line by decompressing the duodenum. The anatomical location of these perforations determines the therapeutic strategy.

Due to the complicated treatment required and the rarity of this injury, managing duodenal injuries presents one of the most difficult challenges in acute surgery. Most injuries are treatable with a simple repair, including simple closure (Duodenorrhaphy) if presented early within 24 hrs. When the repair might cause the duodenum's lumen to narrow, further techniques are required. An alternative may be offered by pedicled mucosal grafts, jejunal serosal patches (side-to-side

jejunoduodenal enterostomy), or omental patch, but these techniques, have little practical utility [4].

For duodenal perforations, immediate surgery is the current standard of care following diagnosis. The standard operating method hasn't been determined, though. If a bulb is perforated, simple closure is usually considered appropriate. However, if the perforated portion is near the papilla of Vater, careful consideration must be given to the treatment chosen, as there is a possibility of bile and pancreatic juice getting mixed. Anastomotic leaking will be more likely as a result of autodigestive effects. In such instances, diverticulization, pyloric exclusion surgeries or a serosa patch are normally carried out. It has longer recovery times, more long-term complications (anastomotic leaks, and marginal ulcers), higher stapler costs, unpredictable pylorus closure leak and a tendency toward higher overall complication rates (71% vs. 33%)(5,6) when compared to a simple repair. Furthermore, the attending consultant or resident may lack sufficient training to conduct the unusual surgery correctly in an emergency. Based on damage control principles, a two-tube ostomy is simpler, requires less time during surgery, preserves the normal anatomy of the gastrointestinal tract, and yields superior results.

Complex duodenal injuries pose a challenge to general surgeon due to their rarity. It is unlikely that most surgeons have extensive experience in managing such injuries. However, the results of poor repair might be devastating, resulting in delayed leaks, extensive abdominal infection, sepsis, and even death. Duodenal perforations which generally occur after endoscopic procedures can be managed conservatively. Surgical management by primary repair or an omental patch may be employed to treat small perforation which could not be managed conservatively. Large duodenal perforations, on the other hand, have been treated with a variety of techniques, including pancreaticoduodenectomy, pyloric exclusion, and drainage. Even though these procedures are successful, many of them are technically difficult and take a long time to complete; these factors make them unsuitable for sepsis patients, who are frequently hemodynamically unstable and exhibiting shock physiology by the time a diagnosis is obtained.

Postoperative duodenal leak (total rate 6.2%, range 0-33%) has been suggested to be the primary cause of higher rates of morbidity (40%) and mortality (16%) [7]. Lesions in the 1st and 2nd portions of the duodenum, blunt trauma involving more than 75% of the duodenal circumference, involvement of the common bile duct and/or pancreas, and delaying treatment beyond the first 24 hours following the trauma are additional unfavourable prognostic factors [8, 9, 10]. To reduce the chance of duodenal suture dehiscence, it's critical to protect a primary duodenal repair. Proteolytic enzyme content and volume simply may cause suture lines to break down, resulting in a fistula that can cause sepsis and peritonitis [11]. The course of the current case was uncomplicated and problem-free, even though there was an initial diagnostic delay that occurred less than 24 hours after the original trauma.

For duodenal injuries, controlled-tube duodenostomy is an additional procedure for surgery that has been traditionally described. However, duodenostomy does not significantly decrease intraduodenal pressure and T-tube drainage of the common bile duct is required for the same. There is a risk of duodenal leakage post-duodenostomy, which should be kept in mind. Furthermore, more Indications for the Tube Duodenostomy include large duodenal perforation where primary closure is not possible.

Triple tube ostomy (gastrostomy, retrograde duodenostomy and feeding jejunostomy) have been used for duodenal perforation but in difficult or giant duodenal perforation higher postoperative morbidities (duodenal fistulas and wound dehiscence) (12) has been observed. Other complications include tube dislocation or migration, intestinal obstruction.

This quick two-tube ostomy procedure eliminates the need for intravenous hyperalimentation by creating a portal for early enteral feeding and only requires basic surgical experience. Therefore, treating these critically ill patients with a low-morbidity and cost-effective approach.

CONCLUSION

Duodenal injuries are difficult to manage but with early diagnosis and early Intervention, results are promising. Cases with Large Perforations and late presentation may require damage control surgery

and staged reconstruction techniques later on. A safe and minimally invasive alternative for reducing the possibility of postoperative leakage is the two-tube approach, which can also lessen its consequences by lowering the chances of a leak and the consequent intraabdominal sepsis. Thus, it can be used for all duodenal perforation with varied aetiology.

REFERENCES

1. Carrillo EH, Richardson JD, Miller FB. "Evolution in the management of duodenal injuries." *J Trauma* (1996); 40: 1037.
2. Kishimoto H, Kagawa S, Uchida T, Itoh E, Murakami N, Kokudo Y, Muraoka A, Tatsumoto A, Sone Y, Tsumura M, Tsuruno M. "Three cases of traumatic duodenal injury." *Jpn J Occup Med Traumatol* (2000); 356-360.
3. Stapfer M, Selby RR, Stain SC, et al. "Management of duodenal perforation after endoscopic retrograde cholangiopancreatography." *Ann Surg* (2000); 232: 191.
4. Degiannis E, Boffard K. "Duodenal injuries." *Br J Surg*. (2000); 87: 1473.
5. Coleman JJ, Zarza BL. "Surgical Management of Abdominal Trauma." *Surg Clin North Am*. (2017 Oct); 97(5):1107-17.
6. Ordoñez C, García A, Parra MW, Scavo D, Pino LF, Millán M et al. "Complex penetrating duodenal injuries." *J Trauma Acute Care Surg* (2014 May); 76(5):1177-83.
7. Schroeppel TJ, Saleem K, Sharpe JP, et al. "Penetrating duodenal trauma: a 19-year experience." *J Trauma Acute Care Surg*. (2016.); 80:461-465.
8. Jurkovich GJ, Bulger EM. "Duodenum and pancreas." *Trauma*. 5th ed. New York, NY, USA: McGraw-Hill; (2003): 709-34.
9. Blocksom JM, Tyburski JG, Sohn RL, Williams M, Harvey E, Steffes CP, et al. "Prognostic determinants in duodenal injuries." *Am Surg* (2004); 70:248-55.
10. Lopez PP, Benjamin R, Cockburn M, Amortegui JD, Schulman CI, Soffer D, et al. "Recent trends in the management of combined pancreatoduodenal injuries." *Am Surg* (2005); 71:847-52.
11. Tsuei BJ, Schwartz RW. "Management of the difficult duodenum." *Curr Surg* (2004); 61:166-71.
12. Pandit N, Yadav TN, Awale L, Adhikary S. "Triple tubostomy and its outcome for blunt duodenal injury." *J Soc Surg Nepal*. (2019); 22:12-17.