

Double Duodenal Perforation: A Case Report

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Abstract

Duodenal perforation is a common cause of acute abdomen which is complication of peptic ulcer disease. The pathogenesis is considered complex and involves imbalance between defensive mechanisms of intestinal mucosa and aggravating factors to which a person is exposed.

Keywords: Double duodenal perforation; Omental patch

Introduction

A twenty-four-year-old male presented to surgery emergency ward of our hospital with chief complaints of pain abdomen for past four days with no history of nausea, vomiting and trauma. He was a known smoker. He was admitted, and investigations were performed. After confirmation of free peritoneal air and clinical assessment suggestive of acute abdomen, patient was explored and found to have two duodenal perforations. Both perforations were closed using omental patch and feeding jejunostomy was done. Patient was discharged in satisfactory condition.

Case Study

A twenty-four-year-old male presented to surgery emergency ward of our hospital with chief complaints of pain abdomen for four days which was more in epigastric region and was sudden in onset, severe in intensity, continuous in nature, non-radiating and was not associated with any aggravating factor. He took medications for the same, but it did not relieve the pain. There was no history of trauma, fever and vomiting. He had no significant history of chronic illness in the past. He was cannabis abuser, known smoker and occasional alcoholic.

On admission, patient was conscious, oriented, afebrile with signs of hypovolemic shock. Abdomen was tense with signs of peritonitis. Chest radiograph showed free air under right dome of diaphragm.

Patient was resuscitated and taken up for exploratory laparotomy. Intra-operatively there were two perforations of $\sim 1.5\text{ cm} \times 1.5\text{ cm}$ and $0.5\text{ cm} \times 0.5\text{ cm}$ in first part of duodenum lying side by side with bile in peritoneal cavity along with pus flakes and no other perforation of hollow viscus was noted. Margins of perforation were sent for histopathological examination (Figure 1).

Both the perforations were repaired using 3-0 polyglactin interrupted sutures using omentum which was split and placed separately over both the perforations and feeding jejunostomy was done $\sim 30\text{ cm}$ distal to duodenojejunal junction using 10 Fr feeding tube. A 32 Fr abdominal drain was kept in Morrison's pouch and abdomen was closed in layers. Gastric decompression was done using 16 Fr nasogastric tube (Figure 2).

Postoperatively patient was kept nil per orally and intravenous fluids were supplemented for initial two days of surgery. On third postoperative day, priming of jejunostomy was done using normal saline and feeds were started later on which were increased subsequently to maximum as the patient tolerated the feeds well. Nasogastric tube was removed on fifth postoperative day and oral sips of clear liquids were started. Patient was given liquid diet on sixth postoperative day and the abdominal drain showed no alteration in the content. Feeding from jejunostomy was reduced gradually and patient was allowed soft diets. Drain was removed on eighth postoperative day. Patient was discharged on anti *H. Pylori* regimen on ninth postoperative day in satisfactory condition.



Figure 1: Double duodenal perforations (side by side).



Figure 2: Split leaves of omentum with interrupted polyglactin sutures.

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Feeding jejunostomy was removed in out-patient department during follow-up.

Histopathology of perforation margins showed fibrocollagenic tissue devoid of any lining epithelium and lymphomononuclear infiltrates.

Discussion

The pathogenesis of peptic ulcer disease may best be considered as representing a complex scenario involving an imbalance between defensive (mucus-bicarbonate layer, prostaglandins, cellular renovation, and blood flow) and aggressive factors (hydrochloric acid, pepsin, ethanol, bile salts, some medications, etc. [1]. In recent years, *Helicobacter pylori* infection and NSAIDs have been identified as the two main causes of peptic ulcer [2].

About 50% of the global population is colonized by *H. pylori* in the gastric mucosa, yet it causes disease in only 10–20%. *H. pylori* shows a variable prevalence (0% to 90%) in perforated ulcers, and ulcers may also develop in the absence of *H. pylori* infection and NSAIDs use [3]. Notably, cofactors such as smoking, and alcohol are found across studies from different regions. The perforation frequency follows in part the geographic distribution patterns of *H. pylori*, with duodenal perforations being more common in regions with a predominant *H. pylori* aetiology [4]. In parallel to the drop in the prevalence of *H. pylori* in many western countries (estimated at 20% to 30%), a change from predominantly duodenal ulcers to gastric ulcers seen in the elderly is attributed to increased NSAID use in this population [5,6].

Management Strategies

Non-operative management: This means of management was considered in patients with good general conditions and localized or minimal symptoms and was propagated half a century ago. In selected consecutive series, up to half of all patients with a PPU sealed spontaneously and underwent a successful non-operative strategy [7,8]. The strategy should include intravenous antibiotics, nil per os and a nasogastric tube, anti-secretory and anti-acid medication (PPIs) and a water-soluble contrast imaging study to confirm a sealed leak. Croft et al. showed success with a non-operative strategy in most patients, but a high failure-rate in the elderly (>70 years) [9].

Operative management: Laparotomy with closure of the perforation using interrupted sutures with or without an omental pedicle on top of the closure has been the main approach for decades. Laparoscopic repair of perforated ulcers is increasingly used but there is no evidence that suggests laparoscopy is better than open surgery. Conversely there is also no evidence that laparoscopy is harmful in patients with sepsis or generalized peritonitis [10].

Repair of the duodenal perforation by plugging of the perforation

using omentum and oversewing was first described by Cellan-Jones in 1929 [11].

In 1937, Graham used free patch of omentum to seal the perforation. In this, a strand of omentum is drawn over the perforation and held in place by full thickness sutures placed on either side of the perforation, and this procedure has become the “gold standard” for the treatment of such perforations [11].

Use of jejunal serosal patch to repair duodenal perforation is another approach where a loop of jejunum is brought up to the perforation and sutured to the defect using interrupted absorbable sutures [12].

Conclusion

Though double duodenal perforation, with causal factors being smoking and chronic NSAIDs use is a rare entity and has not been quoted in any study till date, the surgical management does not differ from simple duodenal perforations. Rigorous resuscitation should be done, and surgery should not be delayed in such cases. Surgeon should not miss any other perforation of hollow viscera in patients with such a positive history.

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