Complicated peptic ulcer disease- An update on management: Narrative review article

Abstract

Complicated peptic ulcer disease are complications that occur from peptic ulcer disease and can be divided into bleeding peptic ulcer, perforated peptic ulcer and gastric outlet obstruction. The diagnosis and management of this condition is important, as bleeding peptic ulcer disease is managed by endoscopy and medical therapy. Perforated gastric ulcer is primarily treated by surgical closure of the ulcer which can be performed by an open or laparoscopic method. Gastric outlet obstruction is managed by endoscopic ballon dilatation with surgical bypass being reserved for failure of medical therapy. As complicated peptic ulcer is associated with a significant morbidity and mortality, we have conducted this review article to look at the management of complicated peptic ulcer disease.

Keywords- “Bleeding peptic ulcer”, “Perforated peptic ulcer”, “Gastric outlet obstruction”, “endoscopic therapy” and “open surgery”

Introduction

Complicated peptic ulcer disease is a clinical spectrum that includes hemorrhage, perforation and obstruction. Medical therapy of peptic ulcer disease with proton pump inhibitors and helicobacter pylori eradication has seen a reduction of uncomplicated peptic ulcer disease but the incidence of complicated peptic ulcer disease has remained static. The incidence of bleeding peptic ulcer ranges from 19.4 to 57 patients per 100,000 population. The incidence of perforation accounts for 3.77 patients per 100,000 population. The risk factors for complicated peptic ulcer disease include the use of non-steroidal anti-inflammatory drugs (NSAID) and Aspirin(1).

The complications of peptic ulcer disease are now the most common acute admissions to the surgical ward despite improved management of peptic ulcer disease with anti-secretory therapy and helicobacter pylori eradication. Bleeding peptic ulcer is the most common complication and is seen in 10% to 20% of cases. The management of bleeding peptic ulcer is by resuscitation and endoscopic therapy with surgery being performed if there is failure of endoscopic therapy. Perforated peptic ulcer is the second most common complication and it is in 2% to 10% of cases. Helicobacter pylori infection is an important factor in the etiology of perforated peptic ulcer and

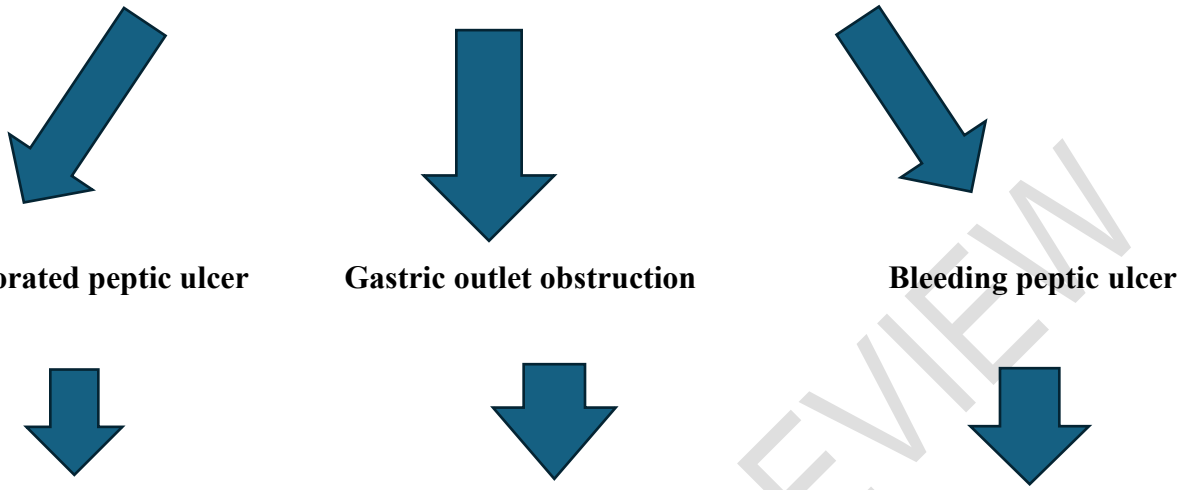
the primary management is surgical closure with helicobacter pylori eradication. Gastric outlet obstruction is the third most common complication that is seen in 5% to 8% of cases. The management can be divided into non-operative therapy that includes anti-secretory therapy and endoscopic ballon dilatation. Operative therapy can be divided into resection like a subtotal gastrectomy or bypass surgery like a gastroenterostomy(2,3).

The World Society of Emergency Surgeons (WSES) in their guidelines on the management of perforated and bleeding peptic ulcer has recommended resuscitation and surgical treatment of perforated peptic ulcer, with laparoscopic surgery being the procedure of choice. Antimicrobial therapy is also essential for management of perforated peptic ulcer. For Bleeding peptic ulcer prompt resuscitation and endoscopic treatment is the first line of therapy, with surgery being reserved for failure of endoscopic therapy. The use of proton pump inhibitors and eradication of helicobacter pylori is essential for the management of both conditions(4).

The management of complicated peptic ulcer disease has seen a change in the trend of management. The management of bleeding peptic ulcer is primarily by endoscopic therapy with surgery being reserved for failure of this form of therapy. For perforated peptic ulcer the primary management is closure of the perforation surgically with laparoscopic closure of perforated gastric ulcer being the preferred treatment option and open surgical closure of the perforated gastric ulcer being reserved for patients who present with sepsis and signs of shock. For gastric outlet obstruction, endoscopic ballon dilatation is the primary treatment of choice with surgical bypass being reserved for failure of this form of therapy. We have conducted this review article to investigate the various management options. We conducted a literature review using PUBMED, Cochrane database of clinical reviews and Google scholar looking for clinical trial, observational studies, cohort studies systemic reviews, and meta-analysis from 1985 to 2024.We used the following keywords, “perforated peptic ulcer”, “Bleeding peptic ulcer”, “Gastric outlet obstruction”, “endoscopic therapy “and “open surgery”. All articles were in English language only. Further articles were obtained by manual cross referencing of the literature. Case reports and studies with less than 10 patients and editorials were excluded. Adult male and female patients were included in this study and pediatric patients were excluded.

Image I. Flowchart showing the treatment options for complicated peptic ulcer disease

Complicated peptic ulcer disease



Discussion

Bleeding Peptic ulcer

The incidence of bleeding peptic ulcer has seen a marked decrease over the past decade. It is seen in older patients with underlying co-morbidities, the use of aspirin and non-steroidal anti-inflammatory drugs(NSAID).The mortality from bleeding peptic ulcer has been constant over the past few years in spite of improved endoscopic therapy, and reduced surgical therapy(5,6).The risk stratification of patients with bleeding peptic ulcer can be done to categorize patients into low risk and high risk patients. The Glasgow Blatchford (GB) scoring system is ideal to identify low risk patients that can be managed as an outpatient. A score of less than 1 is associated with a need for intervention and death of 1%. The Rockall and Glasgow Blatchford (GB) score are used to identify patients at risk of treatment failure, with patients with a Rockall score of more than 6 are associated with a high risk of rebleeding and death(7,8).The endoscopic appearance of a peptic ulcer can be used to assess the risk of rebleeding, The Forrest classification divides the appearance of the ulcer as active bleeding or non-bleeding visible vessel(Forrest 1A,1B,IIA) for high risk patients and low risk patients with a flat, clean base ulcer(Forrest IIC and III)(9).

In High-risk patients who have been presented with bleeding peptic ulcer, after the patients has been resuscitated, endoscopy should be performed within 24 hours from the onset of bleeding. Endoscopic therapy often establishes the diagnosis, achieves hemostasis and reduces the risk of

rebleeding (10–12).Immediate endoscopy is not recommended as the high-risk patient who has not been adequately resuscitated may deteriorate further when endoscopic intervention is done(13).A randomized study by Lau et al looking at the mortality from bleeding in high risk bleeding peptic ulcer patients who underwent endoscopy with 6 hours against those that underwent endoscopy with 24 hours. This study concluded that there was no difference in the mortality between both the groups(14).

Endoscopic therapy for bleeding peptic ulcer can be divided into epinephrine injection of 1:10,000 or 1:20,000 in saline which is injected around the bleeding vessel, which then provides local vessel compression and tamponade effect. Electrocoagulation provides heat and coagulates the bleeding vessel, heater probe which allows transfer of heat over the surrounding tissues. Endo clips which are deployed over the bleeding vessels, over the proximal and distal end of the bleeding vessel. Combination therapy which utilizes injection of epinephrine with endo clip application is associated with better outcomes than monotherapy(15–22).

Surgical therapy is indicated when there is failure of endoscopic therapy for bleeding gastric ulcer. The type of surgical response can be divided into a minimal surgical approach which involves underrunning of the bleeding peptic ulcer (ulcer plication) and a definitive surgical procedure like a vagotomy or gastrectomy which will stop the bleeding and prevent recurrence. The clinical state of the patient is important in deciding which surgical procedure that need to be performed(23).Vagotomy and a drainage procedure is effective to stop the bleeding, but it is associated with an ulcer recurrence rate of 10% to 15%. Gastrectomy is associated with an ulcer recurrence rate of less than 1% but it has a higher morbidity and mortality(24–26).The location of the ulcer will determine which surgical procedure that need to be performed, a bleeding ulcer in the duodenum can be treated with underrunning of the bleeding vessel followed by a truncal vagotomy and a pyloroplasty. For ulcers over the duodenal bulb with scarring, then a subtotal gastrectomy or an antrectomy may need to be performed. Performing a gastrectomy is associated with a higher risk of duodenal dehiscence(27).The current trend in the surgical management of bleeding peptic ulcer is by performing decreasing acid reduction procedures like gastrectomy and this has seen a reduction in mortality and complication rates(28,29).

Table I Forrest classification of non-variceal bleed and prevalence

Forrest Classification	Prevalence (%)	Risk of Rebleeding (%)
Ia	7%	55%
Ib	27%	50%
IIa	26%	43%
IIb	11%	22%
IIc	4%	10%
III	25%	5%

Source: Laine et al.

Perforated peptic ulcer

Perforated peptic ulcer is the second most common complication of peptic ulcer disease. The use of drugs like aspirin, non-steroidal anti-inflammatory drugs (NSAID) and Helicobacter pylori have all been implicated in the etiology of perforated peptic ulcer disease. The most common site of perforation is the first part of the duodenum, followed by the antrum of the stomach. The clinical presentation is with upper abdominal pain followed by acute peritonitis and up to 35% of cases present with sepsis. The mortality rate from perforated peptic ulcer is up to 30%(30,31).The diagnosis of perforated peptic ulcer is confirmed by an erect chest x-ray or by a computerized tomography (CT). The management of perforated peptic ulcer is by surgical therapy which includes simple closure of the ulcer with an omental patch and a vagotomy or performing a partial gastrectomy for a large ulcer. The choice of which surgical procedure will depend on the clinical presentation of the patient. Conservative treatment for a sealed perforated peptic ulcer can be done for patients who present early and who are hemodynamically stable, but it is not routinely recommended (32–34).

The closure of the perforated peptic ulcer can be performed as an open or laparoscopic procedure. The closure is achieved by closing the perforated ulcer over an omental patch and this may be combined with a truncal vagotomy. Open closure of the perforated peptic ulcer is still the gold standard in the management of perforated peptic ulcer(35,36). There have been several studies that looked at the feasibility of laparoscopic closure of the perforated peptic ulcer and these studies concluded that laparoscopic closure of a perforated peptic ulcer was safe, effective and associated with reduced morbidity and mortality(37–41).

The mortality from perforated peptic ulcer is due to patients' factors like increased age, the presence of co-morbidities like diabetes mellitus and hypertension. The onset of presentation is important as the delay in presentation and the presence of sepsis increases the morbidity and mortality(42–44)

Gastric outlet obstruction

This is the third most common complication of peptic ulcer disease, and it is seen in 5% to 10% of cases. The clinical presentation is with upper abdominal pain and non-bilious vomiting, and they develop fluid and acid base balance abnormalities. On examination of the abdomen a succussion splash may be demonstrated. An upper gastrointestinal contrast series or computerized tomography may be used to establish the diagnosis. The diagnosis is confirmed by the inability to pass an endoscope through the pylorus. The management of gastric outlet obstruction can be divided into medical management which involves endoscopic ballon dilatation and helicobacter pylori eradication therapy. Surgical management involves performing a bypass like a gastrojejunostomy or a pyloroplasty(45–48).

The medical management of gastric outlet obstruction is by endoscopic ballon dilatation, where a ballon catheter is passed through the pylorus and dilated for 5 to 10 minutes. The procedure is repeated over a period of 3 to 4 months to maintain patency of the pylorus. The success rate for ballon dilatation is up to 70% after 1 year and 50% after 3 years of therapy. Endoscopic dilatation is a safe procedure with the main complications being bleeding and perforation. Recurrence of symptoms after two years of therapy will indicate failure of therapy(49–53)

Surgical therapy for gastric outlet obstruction involves performing a bypass by either a pyloroplasty or a gastrojejunostomy. The two most common pyloroplasty surgeries are the Finney pyloroplasty and the Heineke – Mikulicz pyloroplasty. Both procedures involve opening the pylorus and first part of the duodenum, and the closure is performed in a transverse manner to maintain patency of the duodenum and stomach. In patients where there is extensive scarring of the duodenum, a gastrojejunostomy can be performed to bypass the obstruction. An ante-colic gastrojejunostomy is the most common bypass procedure that is performed. Gastrectomies are seldom performed for gastric outlet obstruction (54–57)

Conclusion

The management of complicated peptic ulcer disease has seen a trend toward endoscopic and medical therapy. For bleeding peptic ulcer disease endoscopic therapy is the current first line therapy with surgery being reserved for failure of medical therapy. The mortality rate has remained static over the past few years. For perforated peptic ulcer, surgical closure of the perforation is the treatment of choice with laparoscopic repair being the preferred option if the service is available. The mortality from perforated peptic ulcer is high due to the risk of sepsis secondary from acute peritonitis. Gastric outlet obstruction is the least common complication from complicated peptic ulcer disease, and it is management with endoscopic ballon dilatation with surgery being reserved for failure of endoscopic therapy.

Conflict of interest-There is no conflict of interest

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