

Review Article

Open Access

Gastric Ulcer and Surgery

Siniša Franjić

Independent Researcher, Croatia

ABSTRACT

Gastric ulcer is a type of peptic ulcer disease, and peptic ulcers are all ulcers that affect the stomach and small intestine. Gastric ulcer occurs when the thick layer of mucous membrane that protects the human stomach from digestive juices is reduced. This allows the digestive acids to corrode the tissues on the inside of the stomach wall, causing ulcers. Gastric ulcer can be cured, but without proper treatment it can become a serious problem.

*Corresponding author

Siniša Franjić, Independent Researcher, Croatia. E-mail: sinisa.franjic@gmail.com

Received: July 21, 2022; Accepted: July 29, 2022; Published: August 05, 2022

Keywords: Ulcer Types, Surgery, PPU

Introduction

An ulcer could be a break within the continuity of the covering epithelium — skin or mucosa [1]. It's going to either follow molecular death of the surface epithelium or its traumatic removal. An ulcer encompasses a margin or edge which takes characteristic shape in a particular form of ulcer. It's a floor which suggests the exposed surface of the ulcer and it's a base on which the ulcer rests. Base is better felt than seen. Edge is a crucial finding of an ulcer which by itself not only gives a clue to the diagnosis of the ulcer but also to the condition of the ulcer. During a spreading ulcer, the edge is inflamed and oedematous whereas during a healing ulcer the edge, if traced from the red granulation tissue within the centre towards periphery, will show a blue zone (due to thin growing epithelium) and a white zone (due to fibrosis of the scar).

Types of Ulcer

- i) Undermined edge — is usually seen in tuberculosis [1]. The disease causing the ulcer spreads in and destroys the subcutaneous tissue faster than it destroys the skin. The overhanging skin is thin friable, reddish blue and unhealthy.
- ii) F*unched out edge — is generally seen in an exceedingly gummatous ulcer or in a very deep trophic ulcer. the edge drops down at right angle to the skin surface as if it's been cut out with a punch. The diseases which cause the ulcers are limited to the ulcer itself and don't tend to spread to the surrounding tissue.
- iii) Sloping edge is seen mostly in healing traumatic or venous ulcer. Every healing ulcer contains a sloping edge, which is purpleness in colour and consists of new healthy epithelium.
- iv) Raised and pearly-white beaded edge — may be a feature of rodent ulcer. this kind of edge develops in invasive cellular disease and becomes necrotic at the centre.
- v) rolled out (Everted) edge — could be a characteristic feature of squamous cell carcinoma or an ulcerated adenocarcinoma. This ulcer is caused by fast growing cellular disease, the growing portion at the edge of the ulcer heaps up and spills over the conventional skin to produce an everted edge.

During palpation consistency of the sting should be noted. Marked induration of the edge may be a characteristic feature of a carcinoma be it a squamous cell carcinoma or adenocarcinoma. A certain degree of induration or thickness is expected in any chronic ulcer, whether it's atrophic ulcer, gummatous ulcer or a syphilitic ulcer.

Surgical Emergencies

Potential clinical application generally surgical emergencies is greatly varied, and should apply within the situation of the first presentation of the pathology, or during the treatment of an operative complication [2]. Pathologies fall into one of two causes of shock: haemorrhagic or septic. The patients purported to have benefited from the control strategies include bleeding duodenal and gastric ulcers, uncontrolled venous bleeding during pancreatic surgery (pack and return to end the surgery after resuscitation), gastro-intestinal perforations with generalised peritonitis (source control, staple off/isolate the septic source, and return to theatre for reconstruction after resuscitation), acute mesenteric ischaemia (resect the toxic and ischaemic bowel, only reconstructing after revascularisation and resuscitation), toxic megacolon (resect for source control, temporise for resuscitation, and return to theatre to restore intestinal continuity, perhaps without stoma, after resuscitation), and acute cholecystitis (with the employment of an operatively placed cholecystostomy within the severe example, delaying the definitive cholecystectomy to a secondary surgery). In each case, an abbreviated surgery is utilised to help the initial resuscitation and treatment of the explanation for shock: either the haemorrhage is arrested or the sepsis source controlled. Only after the physiology is normalised, the patient is then returned to the hospital room, for anatomical restoration or definitive surgery.

Abdomen

An acute abdomen is sometimes defined as an acute abdominal pain of short duration which needs a decision on whether to proceed or not with urgent intervention [3]. All abdominal crises present with one or more of 5 main symptoms or signs: pain, vomiting, abdominal distension, muscular rigidity, or shock. The severity

and also the order of occurrence of the symptoms are important for diagnosis, along with the presence or absence of fever, diarrhea, constipation, and others. The presence of tenderness on palpation could be a hallmark of potential acute abdominal problem of surgical importance, and it generally implies inflammation of the visceral peritoneum. This tenderness is also accompanied or not by muscular rigidity (defense guarding or guarding). There are several grades of muscular rigidity, and its elucidation isn't always easy on clinical exam, with the exception of the board-like rigidity typical of perforated ulcer. This guarding usually implies inflammation of the parietal peritoneum. Sometimes it takes a good deal of clinical acuity and experience to differentiate between voluntary and involuntary guarding. Modern abdominal imaging, interventional radiology, a far better understanding of the explanation of the many acute conditions, and more effective antibiotic treatments have revolutionized emergency abdominal surgery and definitely improved our decision-making capabilities. CT scan imaging has considerably decreased the challenge of medical diagnosis of the acute abdomen, decreasing also the speed of negative or nontherapeutic abdominal explorations. It's also reduced hospital admission rates and therefore the duration of hospital stays; its overuse, though, should be avoided, especially within the pediatric population.

Decision-making must always involve discriminating between urgent and nonurgent causes; patients suspected of nonurgent diagnoses will be safely reevaluated the next day. Antibiotics should be started as soon as sepsis is recognized. Opioid analgesics shouldn't be withheld for fear of affecting the accuracy of physical examination.

Peptic Ulcer

A peptic ulceration is an excavation formed within the mucosal wall of the stomach, pylorus, duodenum, or esophagus [4]. It's frequently stated as a gastric, duodenal, or esophageal ulcer, betting on its location. It's caused by the erosion of a circumscribed area of mucosa. Peptic ulcers are more likely to be within the duodenum than within the stomach. They have a tendency to occur singly, but there could also be several present at only once. Chronic ulcers usually occur within the lesser curvature of the stomach, near the pylorus. Peptic ulcer has been related to bacterial infection, like *Helicobacter pylori*. The best frequency is noted in people between the ages of 40 and 60 years. After menopause, the incidence among women is almost equal to that in men. Predisposing factors include case history of peptic ulcer, blood group O, chronic use of nonsteroidal anti-inflammatory drugs (NSAIDs), alcohol ingestion, excessive smoking, and, possibly, high stress. Esophageal ulcers result from the backward flow of acid from the stomach into the esophagus.

Zollinger–Ellison syndrome (gastrinoma) is suspected when a patient has several peptic ulcers or an ulcer that's immune to standard medical therapy. This syndrome involves extreme gastric hyperacidity (hypersecretion of gastric juice), duodenal ulcer, and gastrinomas (islet cell tumors). About 90% of tumors are found within the gastric triangle. About one third of gastrinomas are malignant. Diarrhea and steatorrhea (unabsorbed fat within the stool) could also be evident. These patients may have coexistent parathyroid adenomas or hyperplasia and exhibit signs of hypercalcemia. The foremost frequent complaint is epigastric pain. The presence of *H. pylori* isn't a risk factor.

Stress ulcer (not to be confused with Cushing's or Curling's ulcers) may be a term given to acute mucosal ulceration of the duodenal or gastric area that happens after physiologically stressful events, like

burns, shock, severe sepsis, and multiple organ trauma. Fiberoptic endoscopy within 24 hours of trauma or injury shows shallow erosions of the stomach wall; by 72 hours, multiple gastric erosions are observed, and because the stressful condition continues, the ulcers spread. When the patient recovers, the lesions are reversed; this pattern is typical of stress ulceration.

Peptic ulcer disease (PUD) may be a significant health care burden [5]. Its presentations range from being asymptomatic, having mild gastrointestinal type symptoms—dyspepsia and bloating—and succumbing to features of haemorrhage or perforation. Ulcers arise as a result of a breach within the muscularis mucosa of the gastroduodenal wall. The gastric juices exert a deleterious effect to the susceptible mucosa. A powerful correlation is seen between PUD and *Helicobacter pylori* (HP) infection. 95% of duodenal ulcers and 80% of gastric ulcers are seen to harbour the pathogen. There's a younger preponderance in developing countries. This is often because most kids have HP infection before age 10. The prevalence of HP infection is modified by factors like the employment of nonsteroidal anti-inflammatory drugs, smoking, socioeconomic conditions and age.

Gastric Ulcer

Indications for elective surgery of gastric ulcer include failure of a newly diagnosed ulcer to heal after 12 weeks of medical therapy, failure of a recurrent ulcer to respond to therapy, or recurrence after two initial courses of successful treatment [6]. When gastric ulcers fail to heal completely, malignancy must be ruled out; inability to try to do so qualifies as a sign for surgery. The goal of operative treatment should be complete excision of the ulcer for histologic examination. The requirement for a definitive acid-reducing measure to treat gastric ulcer isn't usually required.

Hemorrhage, perforation, and obstruction are the three commonest complications of gastric ulcer. For ulcers located within the prepyloric region or within the body of the stomach, the preferred operation is antrectomy with Billroth I anastomosis. A truncal vagotomy could also be added for prepyloric ulcers or for gastric ulcers related to a duodenal ulcer.

If the ulcer is found proximally on the lesser curvature, antrectomy with extension of the lesser curvature to include the ulcer is preferred. If the ulcer is bleeding and lies too close to the esophago–gastric junction to permit resection, it's treated by vessel transfixion and ulcer oversewing. Within the presence of life-threatening hemorrhage, suture ligation of the ulcer followed by vagotomy and pyloroplasty is an acceptable alternative. Multiple biopsies of the ulcer should be performed whenever possible; this procedure is related to high rates of rebleeding. Operative treatment of a perforated gastric ulcer is accomplished by distal gastrectomy that has the location of perforation. For patients in an unstable condition, excision of the ulcer with primary closure and omental patch overlay is an acceptable alternative.

PPU

On January 1, 1979, the U. S. Food and Drug Administration approved cimetidine, the prototypical H₂ receptor antagonist, which was highly effective in suppressing gastric acid secretion [7]. Cimetidine was the primary medication with annual sales exceeding \$1 billion making it the primary “blockbuster” drug within the pharmaceutical industry. For surgeons, the development of the H₂ antagonists had a profound effect on gastric surgery that's still evident within the present day. Before cimetidine, gastric ulcer disease was rampant and gastric procedures treating peptic ulcer disease were commonplace; however, the widespread

use of H2 antagonists resulted in a very rapid decrease within the number of operations performed for ulcer disease and ominously a pervasive unfamiliarity with the disease process itself developed among surgeons and surgical residents. the development of proton pump inhibitors and also the discovery of the critical role that *Helicobacter pylori* (*H. pylori*) plays in peptic ulcer disease has further decreased the quantity of elective gastric surgery likewise as certain kinds of emergent gastric procedures. While the speed of peptic ulcer hemorrhage seems to possess declined over the previous few decades, the rate of perforation appears to be somewhat stable. Perforation remains a lethal development and nearly 70 you take care of all ulcer-related fatalities are thanks to perforation; thus, it's imperative that surgeons have a working fund of data regarding perforated peptic ulcer (PPU) disease.

The clinical presentation of a patient with a PPU often follows the same course therein there's a sudden onset of intense abdominal pain which will awaken the patient from sleep, related to nausea, occasional vomiting, and rapid-onset peritonitis. The presentation of PPU is so classic that just about 200 years ago, the British physician Edward Crisp stated "The symptoms are so typical, I hardly believe it possible that anyone can fail to create correct diagnosis." On physical exam, the patient typically has board-like abdominal rigidity and obvious peritonitis with associated tachycardia. Fever and hypotension are very late findings in patients with PPU so their absence upon initial presentation shouldn't be accustomed rule out this diagnosis. Upright chest radiograms classically demonstrate free intraperitoneal air under the hemi-diaphragms and further diagnostics studies aren't indicated in cases of obvious peritonitis. The absence of free air on an upright chest radiogram doesn't rule out the chance of a PPU since the sensitivity of this study is only about 75 %. Risk factors for PPU include medications like aspirin or non-steroidal anti-inflammatory agents (NSAIDs), smoking, *Helicobacter pylori* infection, or an antecedent history of peptic ulcer disease although PPU is also the initial presentation in patients with undiagnosed peptic ulcer disease. About two-thirds PPU are juxta-pyloric with the remaining one-third of PPUs evenly distributed between the lesser curve of the stomach and also the anterior wall of the gastric body. Thankfully, perforations near the gastroesophageal junction or posterior gastric perforations are rather rare since these are more difficult to treat surgically.

Helicobacter Pylori

Although there can be numerous elements that make a contribution to the improvement of gastroduodenal mucosal breakdown, we now apprehend that almost all of gastroduodenal ulcerations are due to *Helicobacter pylori* (*H. pylori*) infestation, NSAID use, or a combination of the two [8]. 75 % of sufferers with gastric ulcers and 90 % of these with duodenal ulcers are inflamed with *H. pylori*, but simplest 15–20 % of human beings colonized with the micro organism will broaden PUD of their lifetime. Greater than half of sufferers with PUD record current NSAID use. Additionally, numerous research have verified a cumulative impact of cigarette smoking with *H. pylori* that ends in an elevated hazard of complex PUD. The standard mechanism of ulcerogenesis consequences from the incapacity of the mucosal barrier to guard the gastroduodenal mucosa from acidic gastric secretions. There are a couple of elements which have been related to mucosal harm and immoderate acid secretion which include smoking, mental stress, alcohol, drugs (which include aspirin and cocaine), and numerous environmental associations.

The treatment philosophy for PUD changed into historically "no acid no ulcer." It stays a feasible declaration considering that acid

suppression is the important thing control method to the promotion of healing. Prior to our understanding of the function of *H. pylori* and NSAIDs in ulcerogenesis, therapy changed into long-status and consisted of avoidance of recognized ulcerogenic stimuli such as caffeine, smoking, and alcohol along side pharmaceutical control to relieve symptoms. Surgical intervention, inclusive of antrectomy and vagotomy for acid suppression, changed into then used if relief changed into now no longer received from conservative measures. Pharmaceutical therapy consisted of antacids, H2 blockers (delivered withinside the late 1960s), and numerous oral cytoprotective agents. Proton pump inhibitors (PPIs) had been now no longer introduced till the late 1980s. In 1984, Marshall and Warren published their discovery of "an unidentified curved bacillus in the stomach of patients with gastritis and peptic ulcerations," subsequently referred to as *Helicobacter pylori*. Multiple trials over the subsequent numerous years hooked up the etiology of *H. pylori* in PUD. Subsequently, proof verified that a brief remedy direction with antibiotics and antisecretory agents resulted in a therapy for almost all of ulcers with out recurrence. In 1994, the National Institute of Health Consensus Conference formally recommended the medical eradication of *H. pylori* as the primary therapy for PUD.

It is now understood that *H. pylori* infection results in the alteration of gastric acid secretion this is observed in PUD. If the infection is localized often withinside the antrum, an impairment and alteration withinside the bad comments loop results in increased acid productivity. The ultimate outcome is an increased prevalence of pre-pyloric and duodenal ulcers. Patients which have a international infection of the gastric mucosa constantly have decreased acid secretion in reaction to the chronic infection in the gastric body. This ends in impaired protecting function of the gastric mucosa resulting in ulcer formation.

Ulcerative Colitis

Ulcerative colitis may be a recurrent ulcerative and inflammatory disease of the mucosal and submucosal layers of the colon and rectum [4]. It's a serious disease, accompanied by systemic complications and a high mortality rate; approximately 5% of patients with ulcerative colitis develop colon cancer. It's characterized by multiple ulcerations, diffuse inflammations, and desquamation or shedding of the colonic epithelium of the colonic epithelium, with alternating periods of exacerbation and remission. Bleeding occurs from the ulceration and also the mucosa becomes edematous and inflamed, with continuous lesions and abscesses. ulcerative colitis most typically affects people of Caucasian and Jewish heritage. Predominant symptoms: diarrhea, passage of mucus and pus, left lower quadrant abdominal pain, intermittent tenesmus, and rectal bleeding. Bleeding could also be mild or severe; pallor, anemia, and fatigue result. Anorexia, weight loss, fever, vomiting, dehydration, cramping, and feeling an urgent have to defecate (may report passing 10 to 20 liquid stools daily). Hypocalcemia may occur. rebound tenderness in right lower quadrant. Skin lesions, eye lesions (uveitis), joint abnormalities, and liver disease.

Ulceration

Ulceration could be a late complication which may be due for various reasons [9]. Pyoderma gangrenosum is one ulcer that's distinguished by an irregular shape, with a blue tinge. These ulcers are painful to the touch and patients have difficulty keeping their appliance on. Mild cases answer topical steroids like Locoid scalp lotion or Haelan tape, which absorb well and permit the appliance to stay. Severe cases may require systemic steroids like prednisolone, biopsies of the area and referral to a

dermatologist. Cyclosporin has also been employed in severe cases, but the patients renal function must be closely monitored and regular follow up is paramount as monitoring of the ulcer is vital. Nicorandil may be a vasodilator used to control severe angina and widely employed in patients with coronary heart disease but can cause peri-stomal ulceration, usually with higher doses of 40-60mg/day. Treatment is that the same as for pyoderma and response is slow. Consultation with a cardiologist is necessary, as stopping the Nicorandil or dosereduction could also be necessary.

Marginal Ulcer

Marginal ulcers usually form chronically post-RYGB, usually on the little bowel side of the gastrojejunal anastomosis [10]. Marginal ulcers are linked to smoking, nonsteroidal antiinflammatory drug (NSAID) use, acid exposure from an oversized gastric pouch, and presence of foreign body at the anastomosis like an eroded suture. Patients presenting with early marginal ulcers usually complain of epigastric pain after eating and nausea. the bulk of ulcers after bypass is managed medically, but patients will occasionally present with a perforation of a chronic marginal ulcer that needs emergent surgery. This problem presents as acute epigastric pain that worsens and progresses to peritonitis. Imaging will reveal free air and sure some free fluid. Management is surgical and may encompass repair if possible, omental patch, and wide drainage. there's no role for revising the anastomosis within the setting of an acute perforation. Placing a feeding gastrostomy tube within the gastric remnant should be considered betting on the condition of the patient.

Early postoperative bleeding after RYGB should be managed like the other patient, but there are several unique circumstances in a gastric bypass patient that ought to be considered. Intra-abdominal bleeding most typically occurs at one in all the mesenteries that was divided during the procedure or from a staple line. Potential intraluminal bleeding sites include the pouch staple line, the gastrojejunostomy, the gastric remnant staple line, and also the jejunojunostomy staple line. While most of those events are self-limiting, they will occasionally require surgery if the intraluminal clot causes an obstruction at the jejunojunostomy. Bleeding at the gastrojejunostomy is often heralded by hematemesis and might be managed endoscopically.

Bariatric Operation

Bariatric surgery continues to be the only durable approach to long-term weight loss for the obese population and improves multiple weight-related comorbidities [11]. Although safe with low complication rates, the foremost common procedures roux-en-y gastric bypass (RYGB) and sleeve gastrectomy (LSG) can still be related to risks and adverse events.

Due to the construct of the gastrojejunostomy, RYGB is related to the risk of marginal ulcers, estimated to occur between 0.6 and 16%. However, truth incidence is also much higher as these reports only include ulcers that are diagnosed on upper endoscopy, and plenty of marginal ulcers are likely treated without endoscopic documentation. Multiple modifiable risk factors are related to marginal ulcer development, including smoking, alcohol use, diabetes, NSAID use, surgical technique, and possibly H. pylori infection. If left untreated, marginal ulcers can cause bleeding, strictures, and eventually obstruction. Additionally, because RYGB excludes of a part of the stomach, a rare but potentially fatal adverse event is undetected abnormalities of this excluded stomach, like ulcers or cancer, that aren't easily accessed endoscopically after RYGB.

LSG, although thought of as a simpler bariatric operation, can even be related to certain morbidity postoperatively. the foremost common being gastroesophageal reflux disease and associated Barrett's esophagus. In patients undergoing LSG, 84.1% who had GERD (Gastroesophageal reflux disease) symptoms previously, continued to own GERD symptoms postoperatively, and 8.6% developed new-onset GERD symptoms postoperatively. this is often in contrast to 62.8% resolution of GERD symptoms in patients undergoing RYGB. Given the lack to resolve gastric reflux and also the high incidence of new-onset reflux after LSG, both erosive esophagitis and Barrett's esophagus are generally considered contraindications to sleeve gastrectomy and thus important to identify preoperatively.

Conclusion

Gastric ulcer is actually an open wound on the gastric mucosa, it can occur at any age in both sexes, even in children, but is most common in men over 60 years. The most common causes are Heliobacter pylori, smoking, alcohol, cocaine and methamphetamine, drugs against pain, emotional stress, and sometimes some viral illnesses. Pain around the navel and in the middle of the abdomen, bloating, loss of appetite and weight loss, sometimes nausea, vomiting with or without blood, belching, blood in the stool, these are all signs of a serious visit to the doctor.

References

1. Das S (2010) A Concise Textbook of Surgery, Sixth Edition, SD, Kolkata, India: 156-157.
2. Weber DG, Bendinelli C (2017) Damage Control Surgery for Emergency General Surgery in Di Saverio S, Catena F, Ansaloni L, Coccolini F, Velmahos G (eds) Acute Care Surgery Handbook - Volume 1 - General Aspects, Non-gastrointestinal and Critical Care Emergencies. Springer International Publishing AG, Cham, Switzerland: 397-398.
3. Turégano F (2016) Acute Abdomen: Clinical Assessment and Decision-Making in Di Saverio S, Catena F, Ansaloni L, Coccolini F, Velmahos G (eds) Acute Care Surgery Handbook - Volume 2 - Common Gastrointestinal and Abdominal Emergencies. Springer International Publishing AG, Cham, Switzerland: 1-2.
4. Brunner and Suddarth's Textbook of Medical-Surgical Nursing, Twelfth Edition (2010) Wolters Kluwer Health / Lippincott Williams & Wilkins, Philadelphia, USA: 501-502, 632.
5. Naidu K (2021) Peptic Ulcer Disease in Piscioneri F, Kluger Y, Ansaloni L (eds) Emergency Surgery for Low Resource Regions. Springer Nature Switzerland AG, Cham, Switzerland: 85.
6. Schuster KM, Barquist E (2008) Complications of Gastric Surgery in Cohn SM, Dolich MO (eds) Complications in Surgery and Trauma, Second Edition, CRC Press, Taylor & Francis Group, Boca Raton, USA: 164.
7. Adams Jr CA, Cioffi WG, Valdez C, Diaz JJ (2017) Perforated peptic ulcer and the dislodged PEG in Diaz JJ, Efron DT (eds) Complications in Acute Care Surgery - The Management of Difficult Clinical Scenarios. Springer International Publishing AG, Cham, Switzerland: 97-98.
8. Sixta SL, Davis MA (2017) Peptic Ulcer Disease for the Acute Care Surgeon in Moore LJ, Todd SR (eds) Common Problems in Acute Care Surgery, Second Edition. Springer International Publishing AG, Cham, Switzerland: 206.
9. Abudeeb H, Brown A, Kearney H (2012) Stoma Complications in Dreyer JS, Ball DR (eds) Critical Care Handbook for

- Global Surgery, Alba CCCD SCIO, Dumfries, UK: 175.
10. Aleassa EM, Brethauer S (2019) Management of Bariatric Complications for the General Surgeon in Brown CVR, Inaba K, Martin MJ, Salim A (eds) Emergency General Surgery - A Practical Approach, Springer Nature Switzerland AG, Cham, Switzerland: 444.
11. Odenwald MA, Kavitt RT (2021) Is Routine Upper Endoscopy and H. pylori Testing Indicated in Advance of Bariatric Surgery? in Alverdy J, Vigneswaran Y (eds) Difficult Decisions in Bariatric Surgery. Springer Nature Switzerland AG, Cham, Switzerland: 131-132.

Copyright: ©2022 Siniša Franjić. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.