

A critical Evaluation of Surgical Treatment of Perforated Ulcer

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ABSTRACT The treatment of perforated ulcer disease continues to evolve because of recent advances in pharmacology, bacteriology, and operative techniques. Despite antisecretory medication and *Helicobacter pylori* eradication, it is still the most common indication for emergency gastric surgery associated with high morbidity and mortality. A clinical study was carried out on patients with perforated gastric or duodenal ulcer, admitted in the 1st Surgery Department between 2002 and 2008. During the 7 years of study there were admitted 256 patients with perforated ulcer - 212 cases of duodenal and 44 cases of gastric perforated ulcer. The main surgical treatment option was simple closure with Graham patch, followed by ulcer excision and vagotomy with pyloroplasty. The second major objective was the topical treatment of peritonitis and consisted in the lavage of the peritoneal cavity and drainage. Distal gastric resection has now very limited indications. We recorded no complications postoperatively. In the modern treatment of ulcer, surgery is reserved for the acute (perforation and bleeding) and chronic complications (stenosis / penetration) and exceptionally for the patients with a prolonged history of uncomplicated ulcers with lack of response to conservative therapy.

KEY WORDS perforated ulcer, Graham patch, ulcer excision.

Introduction

Gastric and duodenal ulcer is still one of the most important and expensive gastrointestinal diseases. The discovery of *Helicobacter pylori* and its role in defining the etiopathogenesis of ulcer disease has changed radically the pathogeny of ulcer. The combination of modern antisecretory drugs and eradication of *Helicobacter pylori* has changed the treatment option in favor of conservative therapy and surgery, once the main treatment option, became now exceptional, at least for uncomplicated gastroduodenal ulcers. Moreover, even if acute complications (bleeding, perforation) or chronic (penetration, stenosis) of the ulcer occur, which usually require surgical solutions, the current trend is to use alternative conservative (endoscopic hemostasis) or if surgery can not be avoided, it should solve only the complication (peritonitis or haemorrhage), leaving the pathogenic treatment of ulcers for the conservative therapy. Perforation represents the most acute and serious complication of peptic ulcer, being responsible for most deaths. When is perforating, ulcerative lesion destroys all layers of gastric or duodenal wall, allowing leakage of gastric or duodenal contents into the peritoneal cavity, followed by its contamination with germs and the occurrence of peritonitis.

Material and method

Our study covers a number of 256 patients with perforated gastric or duodenal ulcer treated in the 1st Surgical Department of the Emergency County

Hospital of Craiova between 2002-2008. Data was collected from clinical observation sheets, surgical procedures protocols and necropsy protocols and entered into a standard form, then centralized and processed using Microsoft Excel.

Results

With an average incidence of 35 cases per year ulcer perforation was more common in patients coming from rural areas. Also, the maximum incidence of disease was seen in male patients - sex ratio = 6.31 / 1, maybe due to higher frequency of risk factors for this category of patients. Studying the risk factors, which have included alcohol, smoking and NSAIDs intake, showed that this factors are present in our statistics in more than 50% of cases (152 patients = 59.37%). Chronic alcohol consumption was present in 47 (18.35%) cases, smoking in 33 (12.89%) cases, the combination of smoking – alcohol in 60 (23.43%) cases and the use of NSAIDs in 12 (4.68%) cases. 73 (29%) patients have been known with ulcer, with radiological and /or endoscopic confirmation and suffering lasted between 1 and 20 years, 62 (24%) patients had a history of a ulcerous-type (42 patients) or nonspecific (20 patients) dyspepsia, but without any confirmation. We also observed that in 41.98% (121) of cases, perforation occurred as the first symptom of disease, particularly in younger patients, smokers and alcohol consumers.

The onset of perforation was suddenly, in full health in patients without any apparent history of ulcer or sore in full flare in patients with confirmed ulcers and onset-admission interval was between 30 minutes and a few days (5 max), most patients (167 = 65.23%) presenting in the emergency department less than 6 hours after the onset of painful symptoms.

The clinical picture was dominated by pain, present in all cases, with known characters, vomiting was inconsistent in perforated peptic ulcers, but it may occur in two circumstances: the onset of chemical peritonitis caused by the peritoneal irritation due to the passage of gastric contents into the peritoneum, which triggers vomiting reflex, usually containing food and old peritonitis neglected, in occlusive stage, when vomiting are the result of mechanical and inflammatory occlusion. The incidence of vomiting at the onset of ulcer perforation is significantly higher in gastric perforations (72.7%) than in the duodenum (60.84%), due to the irritation of caused by the gastric content. Hiccups, present at the onset of perforation in 75 cases (29.29%) was due to peritoneal diaphragm irritation and hydro-aeric bowel distension secondary to intestinal paresis in the stage of chemical peritonitis. The patient examination provided local and general signs, extremely useful for positive diagnosis of peritonitis, etiological assumption of peptic ulcer perforation and to assess the overall biological balance of the patient. Plain abdominal X-ray provided the following data:

- Unilateral or bilateral pneumoperitoneum in 172 cases (67.18%), of which gastric perforation 27 cases (61.36%) and duodenal perforation in 145 cases (68.39%). We have to highlight that in 32.81% of cases plain abdominal x-ray radiography did not reveal any pneumoperitoneum without thereby invalidating the diagnosis in the context of other clinical signs.

- hydroaeric images in neglected cases, in occlusive stage - 24 (9.35%).

Abdominal ultrasound, not a routine examination, was performed in 19 (22.61%) patients helping to establish the diagnosis in cases with suggestive clinical picture but without pneumoperitoneum.

Biological investigations are not specific for the diagnosis, but are necessary to establish baseline biological balance and to follow the dynamic evolution of the patient.

In our study group, all patients were operated on. Preoperative preparation was generally a short-term, averaging 1-6 hours, extended

preoperative preparation has been done over this limit in cases with severe, neglected peritonitis, in patients with severe fluid and electrolyte imbalances, oliguria or hemodynamically unstable.

Topographic distribution analysis of ulcer perforation showed following: for duodenal ulcer, perforation was found in 209(81.64%) cases on the anterior wall of the duodenal bulb, of which 15 (7.07%) patients had also a second posterior bulbar ulcer, and in 3 (1.41%) cases were recurrent ulcers, after gastric resection and perforations were located on the duodenal slope of the gastro-duodenal anastomosis.

Table 1. Size of perforation

Size of perforation	Gastric ulcer	Duodenal ulcer	Total
Small (<3 mm)	19 (43.18%)	107 (50.47%)	126 (49.21%)
Medium (4-6 mm)	14 (31.81%)	77 (36.32%)	91 (35.54%)
Large (7-10 mm)	8 (18.18%)	25 (11.79%)	33 (12.89%)
Very large (> 10mm)	3 (6.81%)	3 (1.41%)	6 (2.34%)

Table 2. Surgical treatment of perforated ulcer.

Operation Type	Perforated gastric ulcer	Perforated duodenal ulcer	Total
Simple closure with Graham patch	16 (36.63%)	100 (47.16%)	116 (45.31%)
Open surgery	14	82	96
Laparoscopic surgery	2	18	20
Ulcer excision with vagotomy and pyloroplasty	12 (27.27%)	84 (39.62%)	96 (37.5%)
Gastrectomy	16 (36.63%)	28 (13.20%)	44 (17.18%)
Hemigastrectomy and vagotomy	3	6	9
Pean procedure	9	14	23
Francois-Dubois procedure	2	4	6
Hoffmaister-Finsterer procedure	-	4	4
Reichel-Polya procedure	2	--	2

For the gastric ulcer, perforation was found across all segments, the most common site for the ulcer perforation was prepyloric (18 = 40.9%), followed by the anterior wall (14 = 31.81%), lesser curvature (8 = 18.18%), subcardial area (2 = 4.54%) and posterior wall (2 = 4.54%) .

Regarding the size of perforation we admitted that perforation less than 3 mm are small, from 3 to 6 mm are average, between 7-10mm large and very large those over 10mm. In our study, over 80% of cases had small perforations (126) and medium (91). Our study showed that for gastric ulcers perforated ulcers, perforation occurred as a

complication of old ulcers, callous, large in 24 (54.5%) cases; in 18 cases (40.9%) perforation edges were flexible, and for the remaining four giant perforated ulcer, 2 cases were gastric cancer confirmed by histopathology. Table 1 More than half of perforated duodenal ulcers were acute ulcers (110 cases = 51.88%), in 68 cases perforation occurred in the evolution of chronic ulcer and in another 34 (16.32%) cases perforation occurred in the evolution of already complicated ulcers with penetration (18 = 8.49%) or stenosis (16 = 7.54). In terms of surgical intervention we used these types of surgery Table 2.

209 (81.64%) patients had a good postoperative course and were discharged on average after 7 days after surgery. Postoperative morbidity in perforated peptic ulcer still remains at high values. In our study, 52 patients had complications: local (38 = 14.83%) or general (14 = 5.46%), with a postoperative morbidity rate of 20.31%. Local complications were mainly represented by the surgical wound infection, but we also recorded 4 cases with anastomotic leaks, one case of upper gastrointestinal hemorrhage, 3 patients with hemoperitoneum. Given that all cases were operated, postoperative mortality rate is identical to that of general mortality and was 2.34% (6 deaths)- acute pancreatitis (1 case), myocardial infarction (2 cases) and pulmonary embolism (3 cases).

Discussion

Perforated ulcer presents with one of the noisiest and severe surgical emergencies - peritonitis syndrome, which raises all issues thus the surgeon can establish the diagnosis after an algorithm, which involves the successive stages of a positive, differential and etiological diagnosis. Diagnosis should be made as soon as possible, because treatment of peritonitis has the character of "immediate emergency" [1, 2].

Except a few selected cases with a well-coded indication (perforation in the last 2 hours after onset, elderly, high surgical risks patients) that may tempt a conservative treatment after Taylor-Wagensteen method (nasogastric suction, ice on the abdomen, antibiotics, antacid medication, sedatives, pain relievers), surgery is the main treatment option in peptic ulcer perforation. Tactical, the surgeon may choose to solve only complication (perforation and its consequence - peritonitis) and concomitant association of an operation to break up ulcer pathogenic mechanisms [3, 4].

Option for one of therapeutic options depends on: the ulcer morphology (topography, size etc.),

peritonitis characteristics and patient's comorbidities (age, general condition, different life-threatening diseases, etc.) [1, 5, 6].

Preoperative preparation consisted of mounting a naso-gastric tube, hydroelectrolytic balance correction, broad spectrum antibiotics that are effective on known type of oral flora germs, monitoring vital signs, monitoring diuresis. Preoperative preparation was generally a short-term, averaging 1-6 hours; extended preoperative preparation has been done in cases with severe, neglected peritonitis, in patients with severe fluid and electrolyte imbalances and acid-base, oliguria, hemodynamically unstable.

General anesthesia with oro-tracheal intubation was the anesthetic technique used in all cases because it allows monitoring vital functions and ensures the comfort of a good exploration, allowing the surgeon to solve the lesion and treat the peritonitis.

Regarding the actual surgery, therapeutic attitude has changed considerably over the past 20 years; currently the pathogenesis of ulcer links can be attacked by conservative treatment methods (antisecretory treatment and eradication of HP), closing the perforation and peritonitis treatment is considered the elective attitude, with stable and favorable results in time. Following this trend, in almost half of cases (116 = 45.31%) the operation consisted in simple closure with a Graham patch carried out by open surgery (96 cases) or laparoscopic (20 cases). The procedure, once aimed primarily for duodenal ulcers, has been extended to some gastric ulcers (16 = 36.63%), usually small, prepyloric ulcers, with supple margins and chemical peritonitis.

Ulcer excision (31 cases) followed by pyloroplasty solves the complication, ensure a good gastric drainage; and it can be a therapeutic option in young patients without risk factors, with perforated duodenal ulcers located on the front of the bulb or prepyloric gastric ulcers. Vagotomy makes this process one with an etiopathogenic base, this therapeutic option was chosen for 65 patients (25.39%): 7 with prepyloric ulcers and 58 duodenal perforated ulcers [7].

Distal gastric resection, formerly with broad indications for perforated peptic ulcer surgery, has very limited indications lately; it is now reserved for Johnson type I and IV gastric ulcers and duodenal ulcers exceptionally with double localization or when perforation occurs to a patient with ulcer already complicated with stenosis, penetration or bleeding. Gastric resection was practiced in 17.18% of cases (16 gastric and 28 duodenal ulcers). As for how to restore transit

after gastric resection, we used mostly gastro-duodenal anastomosis-type (Bilroth-Pean) – 70 cases. In case of an old, callous ulcer, with significant local morphological reshuffle were chosen different technical options such as Francois-Dubois (6 cases) or gastrojejunoanastomosis Hoffmeister-Finsterer type in 4 cases or Reichel-Polya in 2 cases [8, 9].

Regardless the type of operation applied, the second major objective was the topical treatment of peritonitis and consisted in the lavage of the peritoneal cavity with warm saline solution in large quantities, removal of false membranes and wide drainage of all areas of the peritoneum cavity (Douglas pouch, laterocolic and subphrenic space).

Postoperatively all the patients received treatment, which continued the supportive therapy started preoperatively and consisted of: monitoring vital signs, naso-gastric suction maintained until the reduction of gastric stasis and the resumption of transit, hydroelectrolitic balance correction, antibiotic therapy (broad spectrum antibiotics), antisecretory therapy (proton pump inhibitors, H2 antagonist) and eradication of *Helicobacter Pylori* [10, 11].

Conclusions

In the current etiopathogenic and therapeutic design of ulcer disease, surgery is reserved for the acute (perforation and bleeding) and chronic complications (stenosis / penetration) and exceptionally or the patients with a prolonged history of uncomplicated ulcers with lack of response to conservative therapy. For the acute surgical complications, according to the literature, the therapeutic option adopted was to solve the

complications (simple closure of the perforation, ulcer excision with pyloroplasty and peritoneal cavity lavage and drainage) and the medical conservative therapy was indicated to attack the pathogeny of the disease.

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