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Comparative assessment of non-operative treatment for perforated peptic ulcer

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Abstract

Current treatment of perforated peptic ulcer still remains mainly surgical. However, non-operative treatment has been shown to be safe and effective in selected patients. It is known that perforated ulcers frequently seal spontaneously by the adherence of the momentum of organs adjacent to the ulcer and operation can be avoided in selected patients. The present study was planned to access the efficacy and reliability of conservative /non-operative treatment of perforated peptic ulcer and also to observe the complication leading to morbidity and mortality

The study was planned in the Department of Surgery in the V.I.M.S, Pawapuri, Bihar from March 2016 to Nov 2016. Total 50 patients identified with the Perforated Peptic Ulcer were enrolled in the present study. The 25 patients undergone the non-operative procedure and 25 patients undergone the surgical procedure for the treatment of the Perforated Peptic Ulcer.

From the above study and the reported literature findings it can be conclude that Non operative management can be done in selected patients with closed monitoring of vitals, which reduces the morbidity induced by surgery and also reduction in formation of intra-abdominal adhesion. Non operative management of peptic ulcer perforation is a safe procedure in selected cases in initial period but care should be taken for the possibility of laparotomy anytime. Particularly conservative treatment can be considered when there is great risk associated with surgery. Conservative treatment of perforated ulcer is, in the PPI era, a valid therapeutic option in patients not eligible for surgical repair due to poor medical condition.

Keywords: perforated peptic ulcer, non-operative treatment, peptic ulcer

Introduction

Peptic ulcer disease (PUD) is a break in the inner lining of the stomach, first part of the small intestine or sometimes the lower esophagus. An ulcer in the stomach is called a gastric ulcer, while that in the first part of the intestines is a duodenal ulcer. The most common symptoms of a duodenal ulcer are waking at night with upper abdominal pain or upper abdominal pain that improves with eating. With a gastric ulcer the pain may worsen with eating. The pain is often described as a burning or dull ache. Other symptoms include belching, vomiting, weight loss, or poor appetite [1]. About a third of older people have no symptoms. Complications may include bleeding, perforation and blockage of the stomach. Bleeding occurs in as many as 15% of people [2].

Common causes include the bacteria Helicobacter pylori and non-steroidal anti-inflammatory drugs (NSAIDs). Other less common causes include tobacco smoking, stress due to serious illness, Behcet disease, Zollinger-Ellison syndrome, Crohn disease and liver cirrhosis, among others [3]. Older people are more sensitive to the ulcer-causing effects of NSAIDs. The diagnosis is typically suspected due to the presenting symptoms with confirmation by either endoscopy or barium swallow H. pylori can be diagnosed by testing the blood for antibodies, a urea breath test, testing the stool for signs of the bacteria, or a biopsy of the stomach. Other conditions that produce similar symptoms include stomach cancer, coronary heart disease, and inflammation of the stomach lining or gallbladder inflammation [1].

Diet does not play an important role in either causing or preventing ulcers. Treatment includes stopping smoking, stopping NSAIDs, stopping alcohol and giving medications to decrease stomach acid. The medication used to decrease acid is usually either a proton pump inhibitor (PPI) or an H2 blocker with four weeks of treatment initially recommended. Ulcers due to H. pylori are treated with a combination of medications such as amoxicillin, clarithromycin and a PPI. Antibiotic resistance is increasing and thus treatment may not always be effective. Bleeding ulcers may be treated by endoscopy, with open surgery typically only used in cases in which it is not successful [2].

Peptic ulcers are present in around 4% of the population. New ulcers were found in around 87.4 million people worldwide during 2015 [5]. About 10% of people develop a peptic ulcer at some point in their life. They resulted in 267,500 deaths in 2015 down from 327,000 deaths in 1990. The first description of a perforated peptic ulcer was in 1670 in Princess Henrietta of England. H. pylori was first identified as causing peptic ulcers by Barry Marshall and Robin Warren in the late 20th century a discovery for which they received the Nobel Prize in 2005 [4].

Once the diagnosis of H. pylori is confirmed, the first line treatment would be a triple regimen where pantoprazole and clarithromycin can be combined with either amoxicillin or metronidazole. This treatment regimen can be given for 7 until 14 days. However, its effectiveness of eradicating H. pylori has been reducing from 90% to 70%. However, the rate of eradication can be increased by doubling the dosage of pantoprazole or increase the duration of treatment to 14 days. Quadruple therapy (pantoprazole + clarithromycin + amoxicillin + metronidazole) can also be used. The quadruple therapy can achieve an eradication rate of 90%. If the clarithromycin resistance rate is higher than 15% in an area, the usage of clarithromycin should be abandoned. Instead bismuth containing quadruple therapy can be used

(pantoprazole + bismuth citrate + tetracycline + metronidazole) for 14 days. The bismuth therapy can also achieve an eradication rate of 90% and can be used as second line therapy when the first line triple regimen therapy failed. After H. pylori is eradicated, there is low risk of recurrent ulcer bleeding when NSAIDs are resumed.

For those with bleeding peptic ulcers, fluid replacement with crystalloids should be given to maintain volume in the blood vessels. Hemoglobin should be maintained at greater than 70 g/dL through restrictive blood transfusion because it has been associated with reduced rate of death. Glasgow-Blatchford score is useful in determining whether a patient should be treated inside hospital or as outpatient. Intravenous PPI can give faster stomach bleeding suppression compared to oral ones. A neutral stomach pH is required to keep platelet in place and to prevent clot lysis. Tranexamic acid and antifibrinolytic agents are not useful in peptic ulcer disease.

Early endoscopic therapy can help to stop bleeding by using cautery, endoclip or epinephrine injection. Treatment is indicated if there is active bleeding in the stomach, visible vessel, or an adherent clot. Endoscopy is also helpful in identifying patients suitable for hospital discharge. Prokinetic agents such as erythromycin and metoclopramide can be given before endoscopy to improve endoscopic view. Either high or low dose PPI are equally effective in reducing bleeding after endoscopy. High dose intravenous PPI is defined as bolus dose of 80 mg followed by infusion of 8 mg per hour for 72 hours. In other words, it is the continuous infusion of PPI of greater than 192 mg per day. Intravenous PPI can be changed to oral once there is no high risk of rebleeding from peptic ulcer.

For those with hypovolemic shock and ulcer size of greater than 2 cm, there is a high chance that the endoscopic treatment would fail. Therefore, surgery and angiographic embolism are reserved for these complicated cases. However, there is a higher rate of complication for those who underwent surgery to patch the stomach bleeding site when compared to repeated endoscopy. Angiographic embolisation has higher rebleeding rate but has similar rate of death when compared to surgery [5].

A perforated ulcer is a condition in which an untreated ulcer can burn through the wall of the stomach (or other areas of the gastrointestinal tract), allowing digestive juices and food to leak into the abdominal cavity. Treatment generally requires immediate surgery. The ulcer is known initially as a peptic ulcer before the ulcer burns through the full thickness of the stomach or duodenal wall. A diagnosis is made by taking an erect abdominal/chest X-ray (seeking air under the diaphragm). This is in fact one of the very few occasions in modern times where surgery is undertaken to treat an ulcer. Many perforated ulcers have been attributed to the bacterium Helicobacter pylori. The incidence of perforated ulcer is steadily declining, though there are still incidents where it occurs. Causes include smoking and non-steroidal anti-inflammatory drugs (NSAIDs). A perforated ulcer can be grouped into a stercoral perforation which involves a number of different things that causes perforation of the intestine wall. The first symptom of a perforated peptic ulcer is usually sudden, severe, sharp pain in the abdomen. The experience is typically so intense that most people precisely recall the exact moment the pain began. The pain is typically at its maximum immediately and persists. It is characteristically made worse by any movement, and greatly intensifies with coughing or sneezing [6].

Current treatment of perforated peptic ulcer still remains mainly surgical. However, non-operative treatment has been shown to be safe and effective in selected patients. It is known that perforated ulcers frequently seal spontaneously by the adherence of the momentum of organs adjacent to the ulcer and operation can be avoided in selected patients. The present study was planned to access the efficacy and reliability of conservative /non-operative treatment of perforated peptic ulcer and also to observe the complication leading to morbidity and mortality

Methodology

The study was planned in the Department of Surgery in the V.I.M.S, Pawapuri, and Bihar. From March 2016 to Nov 2016. Total 50 patients identified with the Perforated Peptic Ulcer were enrolled in the present study. The 25 patients undergone the non-operative procedure and 25 patients undergone the surgical procedure for the treatment of the Perforated Peptic Ulcer. All the patients were informed consents the aim and objective of the present study was conveyed to them. Approval of the institutional ethical committee was taken prior to conduct of this study.

Following was the inclusion and exclusion criteria for the present study:

Inclusion Criteria: Patients with Perforated Peptic Ulcer.

Exclusion Criteria: Presence of fever as it indicates septicemia and typhoid test (typhi Dot) positive patients as they have high chances of illegal perforation.

Conservative treatment is known as the Taylor method and consists of nasogastric aspiration, antibiotics, intravenous fluids and nowadays H. pylori triple therapy. In 1946, Taylor presented the first series of successful outcome of conservatively treated patients with PPU, based on the theory that effective gastric decompression and continuous drainage will enhance self-healing [7].

Results & Discussion

In our study we tried the safety of conservative treatment also known as the Taylor method of perforated peptic ulcer. Our results show that in the era of PPI this approach can be applied in patients with acceptable morbidity and no mortality. Study of the natural history of peptic ulcer perforation has shown that, after perforation occurs, it is promptly sealed by adjacent organs. A fibrin clot appears quickly on and around the perforation. This is the initiation of definitive closure of perforation with the help of adhesions between perforated ulcer and adjacent organs [8-9].

According to Donovan, this process of self-healing is sufficient in 50% of patients [10]. It is a not uncommon experience for surgeons operating on perforated peptic ulcer to find that they first have to mobilize the perforation from adjacent organs or perforate the already sealed perforation before being able to repair it. Usually, in the peptic ulcer perforation the peritoneal cavity remains sterile for 12 hours, because of less bacterial load in the upper gastrointestinal tract. However, some patients develop peritonitis due to continuous fluid extravasation, higher bacterial load of the upper gastrointestinal tract and impaired spontaneous sealing of the perforation. These observations were the basis for the development of conservative treatment.

There are two types of peptic ulcer perforation: free and sealed. Free perforation of the peptic ulcer occurs when gastric and duodenal contents spill freely into the peritoneal cavity. Sealed perforation occurs when the ulcer creates a full thickness hole in the stomach or duodenum, but spillage is prevented by the physical adherence of the omentum of adjacent organs. When non-operative treatment is being considered, demonstration that the perforation has already been sealed is required before therapy is initiated [11]. It is crucial to determine which patients have on-going leakages and which have self-sealed perforations. The initial clinical examination is unreliable in predicting which patients with perforations and peritonitis have sealed perforations.

A subsequent study by Berne and Donovan [12] reported 35 patients had perforated duodenal ulcers with gastro duodenography documented sealed perforations. The mortality rate of these 35 patients treated non-operatively was 3%; while the mortality rate for 118 patients treated operatively during the same period was 6.2%. An intra-abdominal abscess developed in one of the 35 patients.

Table 1: Comparison of Different Parameters in Two Study groups

	Non-operative management	**Surgery**
Total Cases	**25**	**25**
Sex		
Female	20	11
Male	5	14
Pain duration prior to admission≥12 h		
Yes	4	8
No	21	17
Steroid use		
Yes	1	2
No	24	23
NSAIDs use		
Yes	6	10
No	19	15
Helicobacter pylori infection		
Yes	15	13
No	10	12
Satiety when perforated		
Yes	11	13
No	14	12
Leukocyte count ≥12 × 109/L		
Yes	22	21
No	3	4
Albumin level ≥30 g/L		
Yes	20	23
No	5	2
Ultrasound: fluid collection		
Yes	4	16
No	21	9
Plain film: Pneumoperitoneum		
None	3	5
Unilateral	16	18
Bilateral	6	2
Water-soluble contrast examination: extravasation		
Yes	2	16
No	23	9

Table 2: Clinical results

	Non-operative management	**Surgery**
Total Cases	**25**	**25**
Morbidity	3	4
Respiratory infection	2	2
Wound infection	0	1
Wound dehiscence	0	1
Abdominal abscess	4	0
Sepsis	1	1
Urinary infection	0	0
Renal failure	0	0
Cardiovascular	0	0
Length of hospital stay days	10 – 12 days	11- 13 days

The common treatment for patients with perforated peptic ulcer is surgical repair [13]. In most cases an omental patch repair is performed, followed by treatment with H2 receptor antagonists and if indicated HP eradication therapy [14-16]. Non-operative treatment for perforated peptic ulcer can be successful, as first reported by Taylor in 1957. He compared operative and non-operative treatment for perforated peptic ulcer and reported similar mortality rates in both groups (5%) [17]. Crofts *et al*. compared the outcome of non-operative treatment with that of emergency surgery in a randomised trial and reported an overall mortality rate of 5% in each group and no significant difference in morbidity [18]. Crofts *et a*l. conclude that an initial period of non-operative treatment is safely allowed except in patients over 70 years old [19]. Kaene *et a*l. reported favourable survival rates (2.4% mortality) in a series of 42 patients treated non-operatively compared with reported surgical mortality [20]. The importance of careful clinical observation by an experienced surgeon is emphasised in reported literature, because non-operative treatment should be promptly abandoned if unsuccessful [17-22].

Conclusion

From the above study and the reported literature findings it can be conclude that Non operative management can be done in selected patients with closed monitoring of vitals, which reduces the morbidity induced by surgery and also reduction in formation of intra-abdominal adhesion.

Non operative management of peptic ulcer perforation is a safe procedure in selected cases in initial period but care should be taken for the possibility of laparotomy anytime. Particularly conservative treatment can be considered when there is great risk associated with surgery. Conservative treatment of perforated ulcer is, in the PPI era, a valid therapeutic option in patients not eligible for surgical repair due to poor medical condition.

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