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The outcome of operative and non-operative treatment of duodenal ulcer perforation

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Abstract
We present a case of perforated duodenal ulcer which was first considered using the results of the endoscopy examination. Erect chest radiography and abdominal CT scan identified the site of the perforation and excluded other intra-abdominal lesions. Sealed perforated duodenal ulcer was shown on water soluble gastroduodenogram.
As the patient's general condition remained stable, we prescribed nonoperative management and patient's clinical condition was closely monitored. The patient had clinical improvement after undergoing nonoperative treatments. It is believed that water soluble gastroduodenogram may help the diagnosis of sealed perforation. Sealed perforated duodenal ulcer allows for nonoperative management and may reduce the need for surgery in such patients.

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

Introduction
Current treatment of perforated peptic ulcer still remains largely surgical. However, nonoperative treatment has been shown to be safe and effective in selected patients [1]. It is known that perforated ulcers frequently seal spontaneously by the adherence of the omentum of organs adjacent to the ulcer [2] and operation can be avoided in selected patients. We present a case of sealed perforated duodenal ulcer in which the use of water soluble gastroduodenogram helped in the diagnosis and led to successful nonoperative management.
A 55-year-old man with neurofibromatosis arrived at our emergency department (ED) complaining of upper abdominal pain for 2 to 3 days. The pain was restricted to the epigastric area, mainly dull with episodes of sharp sensation in character that radiated to back sometimes. This pain was accompanied by nausea and night pain.
There was no history of epigastric pain, dizziness, palpitation, sweating, fever, or passage of black stool. On admission, the blood pressure was 136/70 mmHg, pulse was 74 beats/minute, body temperature was 36.3°C, and respirations were 14/ minute. Examination revealed a clear consciousness, multiple soft subcutaneous nodules over his trunk and extremities, and tenderness without rebounding pain over the epigastrium.
Laboratory test results showed normal hemoglobin (16.6 g/dL), amylase (29 IU/L), and renal function (BUN: 26 mg/dL, creatinine: 0.8 mg/dL), elevated white blood cell count (17300 mm^3) with left shift (Neutrophil: 91.4%). Erect chest radiography taken in the ED was interpreted as normal except for multiple nodular lesions found over his abdomen and lower chest.
Esophagogastrod uodenoscopy (Fig. 1) showed one deep active ulcer at the anterior wall of the duodenal bulb. Follow up chest radiography (Fig. 2) demonstrated free air beneath the diaphragm. Abdominal CT scan (Fig. 3) revealed intra-abdominal free air and thickened wall at the duodenal bulb and thickened adjacent omentum. Perforated duodenal ulcer was evident. A nasogastric tube was inserted to drain the gastric contents. Intravenous administration of a proton pump inhibitor and antibiotics were begun immediately. The patient's abdominal pain gradually improved in the ED. Surgical consultation suggested conservative treatment rather than surgery. We decided to take a nonsurgical approach in the management of his ulcer and carefully monitored for any evidence of clinical deterioration.
Water soluble gastroduodenogram was performed and showed no extra luminal spillage of the contrast medium. Two days after his admission, the patient's epigastric pain was almost completely alleviated. On the fifth day of admission, the tenderness in his epigastrium was eliminated.
Repeated radiography of the chest revealed no intra-abdominal free air. He was able to resume eating and discharged from the hospital on the 10th day of admission. He continued anti-ulcer therapy with a proton pump inhibitor for another 6 weeks and complete helicobacter pylori eradication. There was no abnormality other than duodenal ulcer scar on the esophago gastroduodenoscopy performed 6 weeks after his discharge.

Research Study
Little interest was expressed in nonsurgical treatment of perforated duodenal ulcer until the report of Taylor in the early 20th century. At the time of surgery, he observed that perforated duodenal ulcers were often already sealed. In D Y Patil medical college, Pune, I reported on perforations in 118 peptic ulcer patients who were treated non-operatively; only 21 needed surgical treatment. The overall mortality rate of 11% was almost half that generally recorded for perforated peptic ulcer at that time. In the 1980s the mortality rate of those who received conservative treatment for perforated duodenal ulcer compared favorably with the reported mortality rate after surgery [3, 5].

Fig 1: Esophagogastroduodenoscopy Shows One Deep Active Ulo

Despite the data, conservative treatment of perforated peptic ulcer has not gained widespread acceptance and remains controversial. The reason may be the need for prudent clinical monitoring by an experienced surgeon when such an approach is to be adopted [2, 4].

Six to 12 hours after perforation, the patient enters the so called stage of delusion, when the acute pain of peritonitis subsided and the abdominal rigidity lessens. During this phase, leakage of the enteric contents may continue. Unless an experienced surgeon examines and assesses the patient closely for a short interval after admission, it is likely that any deterioration in the patient's condition will be missed.

Fig 2: Erect Chest Radiography Taken after Endoscopy There Is Free Sub diaphragmatic Air

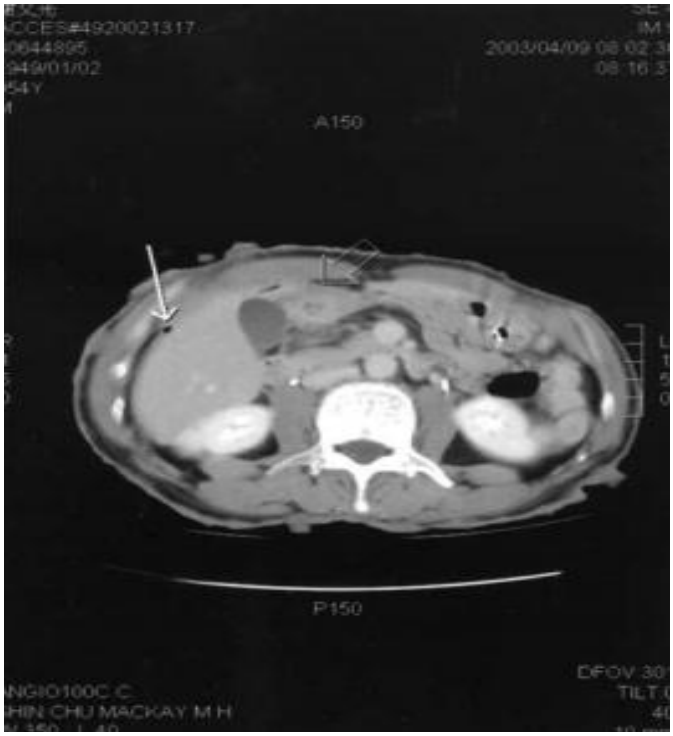

Fig 3: Abdominal Ct Scanning Shows Thickened Duodenal Walt and Adjacent Omentum (Open Arrow) and Itraabdomial Free Air (Arrow**)**

Discussion

There are two types of peptic ulcer perforation: free and sealed [6]. 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 nonoperative treatment is being considered, demonstration that the perforation has already been sealed is required before therapy is initiated [6]. It is crucial to determine which patients have ongoing leakages and which have self-sealed perforations. The initial clinical examination is unreliable in predicting which patients with perforations and peritonitis have sealed perforations.

Water soluble contrast medium gastroduodenogram has been utilized to identify the presence or absence of active leakage of perforated ulcers. Approximately 40% of perforated duodenal ulcers examined using this method were found to be sealed at the time of examination. Ulcer releaking occurred in only two of 109 patients treated nonoperatively [7].

A subsequent study by Berne and Donovan [4] reported 35 patients had perforated duodenal ulcers with gatroduodenogram documented sealed perforations. The mortality rate of these 35 patients treated nonoperatively 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.

Reperforation did not occur. Berne and Donovan concluded that perforated duodenal ulcers can be safely treated nonoperatively when the gastroduodenogram documents show the ulcer is self-sealing. Nonoperative treatment of peptic ulcer has been shown in a randomized trial [1] to be safe and effective in selected patients: those under 70 years old who were hemodynamically stable, been perforated for less than 24 hours, and could be carefully monitored for any evidence of deterioration.

Non operative treatments included nasogastric suction, intravenous fluids resuscitation, antibiotics, and anti-ulcer medications. In those who had no improvement with nonoperative treatments underwent operations. The delay did not cause additional morbidity. The overall mortality rates in the two groups (surgery versus non-surgery) were similar (approximately 5%), and did not differ significantly in the morbidity rates (40% vs 50%). The hospital stays were 35 % longer in the group treated conservatively [1].

Recently group of researchers also concluded that conservative treatment was a reliable alternative in selected cases of perforated gastroduodenal ulcers [8]. The most common complication of nonoperative management was intraabdominal abscess formation. Fortunately, most intraabdominal abscess formations can be treated with antibiotics and/or percutaneous drainage without sequelae [1, 8, 9]. However, there are pitfalls for nonoperative treatment for perforated peptic ulcers.

First, it is necessary to reassess the patient every few hours. In these patients selected for nonoperative treatment, 5 to 28 % of patients later underwent operations [1, 4, 8, 9]. When evidence of peritonitis showed progression, or when there was no evidence of regression by 12 hours, surgery was indicated to rule out another cause of peritonitis or releasing from the ulcer [1, 4, 9, 10].

Secondly, follow-up endoscopy at 6 weeks is mandatory to monitor ulcer healing and to exclude other lesions. Gastric cancers were detected on subsequent endoscopy in one series [9]. Thirdly, corpus gastric ulcers are clearly a different problem, being more difficult to manage nonoperatively because of more frequent leakage, bleeding, recurrence, and the possibility of malignancy.

Conclusion

The nonoperative management of a sealed gastric perforation may be inappropriate unless the patient faces a prohibitive operative mortality [4]. Fourthly, patients over the 70 year old were less likely to respond to conservative treatment than younger patients [1]. We recommend the guidelines for nonoperative management [1, 8] at the hospital for those with a history of less than 24 hours should include, erect chest radiography, placement of nasogastric tube, broad-spectrum antibiotics, intravenous fluids, intravenous H2-blocker or proton pump inhibitors, water soluble gastroduodenogram, and close observation of the patient's hemodynamic status and general condition by a senior surgeon, the patient should receive antiulcer medications at discharge and undergo follow-up endoscopy [1,4,8,9,11].

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