

Perforated Duodenal Ulcer in High Risk Patients: Is Percutaneous Drainage Justified?

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Abstract

Background: Conservative treatment was recommended as the treatment of choice in perforated acute peptic ulcer. Here, we adjunct percutaneous peritoneal drainage with nonoperative conservative treatment in high risk elderly patients with perforated duodenal ulcer. **Aim:** The work was to study the efficacy of percutaneous peritoneal drainage under local anesthesia supported by conservative measures in high risk elderly patients, according to the American Society of Anesthesiologists grading, with perforated duodenal ulcer. **Patients and Methods:** Twenty four high risk patients with age >65 years having associated medical illness with evidence of perforated duodenal ulcer. **Results:** The overall morbidity and mortality were comparable with those treated by conservative measures alone. **Conclusion:** In high risk patients with perforated peptic ulcer and established peritonitis, percutaneous peritoneal drainage under local anesthesia seems to be effective with least operative trauma and mortality rate.

Keywords: Duodenal ulcer, High risk, Percutaneous drainage, Perforation

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Introduction

Despite dramatic improvements in peptic ulcer management in the last two decades, the frequency of emergency surgery for perforated gastroduodenal ulcer has remained stable or even increased.^[1,2] This may be due to an increase in prescription of aspirin and/or nonsteroidal anti-inflammatory drugs, especially in older subjects.^[3]

The accepted therapeutic options in patients with perforated peptic ulcer are simple closure or immediate definitive operation.^[3,4] Conservative treatment was recommended as the treatment of choice in perforated acute peptic ulcer.^[4] Taylor's method,^[4] in selected cases of perforated gastroduodenal ulcers with good general condition, comes again into attention.^[3] Today, it is

reserved for patients considered too ill to stand the stress of surgery or in situations where immediate surgery is unavailable.^[5-7] Here, we adjunct percutaneous peritoneal drainage with nonoperative conservative treatment in high risk elderly patients with perforated duodenal ulcer.

The aim of this work was to study the efficacy of percutaneous peritoneal drainage under local anesthesia supported by conservative measures in high risk elderly patients with perforated duodenal ulcer when surgery is indicated but carries the high risk of mortality.

Patients and Methods

Twenty four high risk patients with evidence of perforated duodenal ulcer were admitted to the emergency department in Port-Fouad general hospital, Port-Fouad, Port-Said, Egypt and in the University Hospital, Department of surgery, Faculty of Medicine, Suez Canal University, Egypt. All were diagnosed by history, clinical examination, and imaging study to have such perforations. Our patients were of both sexes with age >65 years. Each of all had at least two of the traced risk factors. The risk factors are associated medical illness; as chronic obstructive pulmonary disease (COPD), myocardial ischemia, chronic renal disease and

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long standing diabetes; chronic ingestion of nonsteroidal anti-inflammatory drugs, aspirin, corticosteroids or immunosuppressants; and smoking habits.^[8]

Preoperative workup

The diagnosis of perforated duodenal ulcer was established by the obvious symptoms and abdominal signs with erect chest X-ray and ultrasonography (US) of the abdomen. For all patients full laboratory work up was requested as urine analysis, complete blood picture, bleeding profile, renal and liver function tests and serum amylase.

Surgical teams and study sites

Our treatment policy was conducted in Port-Fouad general hospital, Port-Fouad, Port-Said, Egypt and in the University Hospital, department of surgery, Faculty of Medicine, Suez Canal University, Egypt.

Methods

High risk identification

The high risk can probably be defined in two different ways related to individual and procedure. The first would be if the individual's risk of mortality is either >5% or twice the risk of the population undergoing that procedure. The second description suggests that a high risk procedure is one with mortality greater than 5%. Furthermore, surgical patients for whom the probable mortality is greater than 20% should be considered 'extremely high risk' patients.^[9]

Preoperative risk stratification

The American Society of Anesthesiologists (ASA) grading on a scale of I to IV. Grade III was considered in patients with severe systemic disease that limits activity, but not incapacitating and grade V for patients with severe systemic disease that is a constant threat to life.^[4] Those patients, in our study, were given three and four points, respectively.

Boey score has determined a group of risk factors for mortality in perforated peptic ulcer, preoperative BP<100 mmHg, delayed presentation >24 h, and major medical illness present.^[10] One point was given for each item and for every added medical condition. The following medical conditions were traced in our patients:

- Ischemic heart disease
- Congestive heart failure
- Chronic obstructive pulmonary disease
- Long term steroid use
- Recent cerebrovascular stroke.

Calculation of risk factors

According to ASA and Boey score, here we adopted

a four-point scoring system for risk factor calculation. This simple scoring system consisted of (1) ASA grade I was given one point and one point more for subsequent grade; (2) Presentation, one point for delayed presentation beyond 12 h; (3) Shock was given one point; and (4) One point was given for each medical condition.

In a patient with ASA grade II having two medical comorbidities, presented with shock and beyond 12 h after the onset of perforation, calculation of risk factors in such patient is as follows:

ASA grade II and the medical comorbidities were given two points for each. Delayed presentation and shock were given one point for each. The sum of these points represented the risk factors scoring of this patient.

A score of 6 points was considered as high risk and patients with a score more than 6 points should be considered 'extremely high risk' patients. One of our patients was graded as ASA III and presented after 24 h of the onset of perforation with shock. He also had ischemic heart disease and recent cerebrovascular stroke. Calculation of risk factors in such patient was as $3 + 1 + 1 + 2 = 7$ points

Nonoperative Taylor's method

Taylor's method, consisting of nasogastric aspiration, fluids resuscitation, parenteral broad spectrum antibiotics, and antisecretory drugs, was assessed by meticulous repeated physical examinations, dynamics of WBC (white blood cell) and US.^[11,12] Conservative management consisted of intramuscular analgesia, intravenous antibiotic (Cefazolin 1 g every 6 h), H₂-blocker (Ranidine 50 mg intravenously every 8 h), and hydration. A large bore radio-opaque nasogastric tube was passed to empty the stomach by intermittent suction. Accurate tube placement in the distal greater curvature and frequent re-assessment were mandatory in this regimen.^[12]

Operative technique

In conjunction with conservative measures, percutaneous peritoneal drainage was performed under local anesthesia through a 3-cm long skin incision at the level of right anterior superior iliac spine and the lateral edge of the rectus muscle [Figure 1a]. The incision spitted the external oblique aponeurosis, internal oblique, and transversus abdominus along the direction of its fibers [Figure 1b]. Upon entering the peritoneal cavity, the index finger was swiped in all direction to allow protection and good drainage [Figure 2a]. Two wide bored intra-abdominal tube drains of 20 French gauge was placed through this skin incision. Drains were inserted just after entering the peritoneal cavity and pus

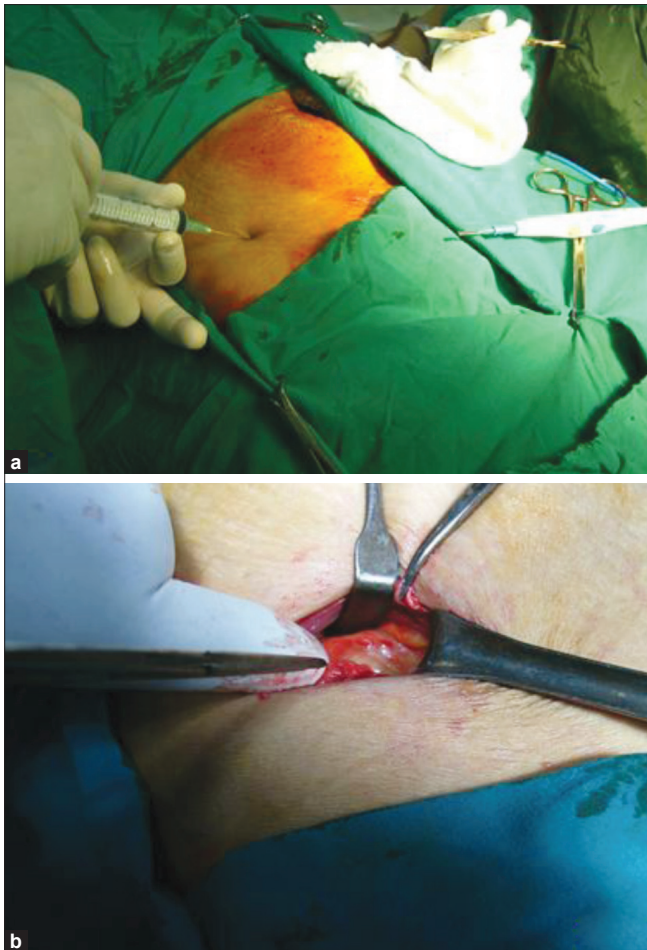


Figure 1: a) A preoperative photograph showing local anesthetic infiltration. b) An intraoperative photograph showing intact peritoneum with pus underneath

was evacuated, one toward the pelvic cavity and the other in the upward direction just for a hand breadth from the incision [Figure 2b]. Serial abdomino-pelvic ultrasonography was performed to detect the amount of peritoneal fluid and so, the efficacy of peritoneal drainage.

Postoperative periods

The insertion of a nasogastric tube was maintained to decompress the stomach and a Foley catheter to monitor urine output. Intravenous infusion of fluids was continued, and broad-spectrum antibiotics are administered. In select cases, insertion of a central venous line may be necessary for accurate fluid resuscitation and monitoring. The nasogastric tube can be discontinued on postoperative day 2 or 3, depending on the return of gastrointestinal function, and diet can be slowly advanced.

Outcome parameters

The primary end point in the present study was the

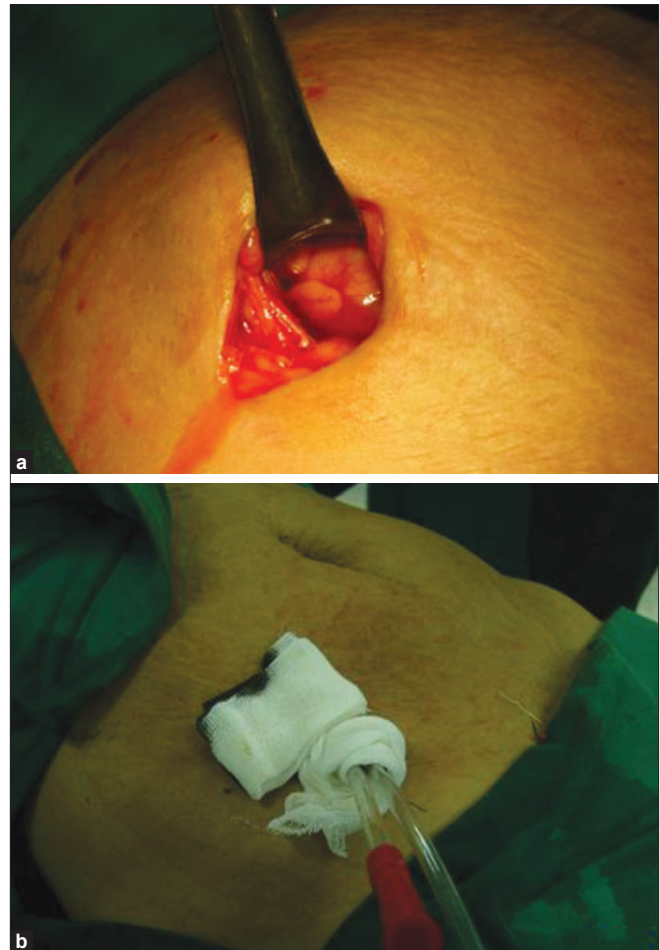


Figure 2: a) An intraoperative photograph showing evacuation of peritoneal fluid. b) An intraoperative photograph showing drains in position

mortality which translated the success rate of the procedure. The second end point was patient satisfaction and post-procedural complications such as (1) failure of the procedure necessitating open repair of the perforated ulcer; (2) localized abscess formation in the form of pelvic, right iliac fossa abscesses and subphrenic abscesses; and (3) wound sepsis.

Results

Demographic data

Of the 24 patients in the present study, there were 16 males and 8 females. The mean age of patients was 70.9 ± 4.25 years (range 65–79). The co-morbid medical conditions were traced in our patients and showed that more than one condition was found in all of them [Table 1], 18 patients were presented with preoperative BP < 100 mmHg and delayed presentation > 24 h.

Preoperative risk stratification

According to the adopted four- point scoring system

Table 1: The distribution of comorbid conditions in our patients

Disease	Male	Female
Ischaemic heart disease	10	6
Congestive heart failure	2	1
COPD	10	8
Recent cerebrovascular stroke	1	1
Long-term steroid use	4	2

COPD: Chronic obstructive pulmonary disease

Table 2: The risk stratification according to the adopted score in our patients

Score	Male	Female	Total %
7	5	3	33
8	6	2	33
9	3	1	17
10	2	2	17
Total	16	8	100

for risk factor calculation we noticed that none of our patients had 6 points but all had scores from 7 to 10 points denoting extremely high risk situation [Table 2].

Postoperative mortality

The overall mortality rate was 5 out of 24 patients (20.8%), two of these five patients were treated by the proposed procedure and the remaining three patients were explored to close the perforation. The two post-procedural deaths without exploration were seen in patients with higher scoring (10 points) presented after 24 h of perforation with shock and evidence of generalized peritonitis. One of them was a lady suffering from congestive heart failure, chronic renal and hepatic insufficiency and lastly recent cerebrovascular stroke. The second was a gentleman having the same data but suffered from chronic obstructive pulmonary disease. The other three patients showed failure of the procedure and open repair was mandatory to close the perforation. The score of these patients was 9 points in two and 10 points in one. The indication of surgery for these three patients was decided according to the proposed efficiency of original Taylor's method and this indication was assessed by meticulous repeated physical examinations, dynamics of WBC (white blood cell) and abdomino-pelvic US.^[11,12]

Postoperative morbidity

Post-procedural intra-abdominal infection including pelvic and right iliac fossa collections occurred in three patients (12.5%). Two of these three patients were treated by metronidazole 500 mg intravenous infusion / 8 h for 5 days together with intravenous antibiotic Cefazolin 1 gram every 6 h. The last one needed image-guided

aspiration of the residual fluid. Wound infection was diagnosed in two patients (8.3%).

Discussion

The higher mortality rate in the old population, justifies the search of prognostic factors specific for the elderly in whom the difficult management was attributed to their concomitant diseases.^[13-15] The criteria in selected cases were diagnosis of perforation in less than 12 hours, with stable hemodynamic condition and age not exceeding 70 years.^[5] Emergency abdominal operations are commonly performed and carry high morbidity and mortality risk, particularly in elderly patients due to presence of coexisting cardiopulmonary disease, late admission and presence of peritonitis.^[16,17] An interesting study tried to trace the mortality rate for patients undergoing surgery for peptic ulcer perforation despite improvements in perioperative treatment and monitoring and found that the septic state of the patient on admission was an important risk factor and concluded that in order to improve the outcome of patients with peptic ulcer perforation, sepsis needs to be factored into the existing knowledge and treatment.^[7]

Therefore, in high risk elderly patients with perforated duodenal ulcer and established peritonitis, pus should be drained with the least invasive maneuver. Transnasogastric placement of a drainage catheter through the perforated ulcer was said to be as successful as definitive therapy.^[18] High risk peptic ulcer perforation patients can be managed by putting in an intra-abdominal drain supported by conservative treatment with (4.5%) deaths and (87.8%) patients improved satisfactorily.^[19] In a study retrospectively analyzed high risk patients underwent surgical treatment for perforated duodenal ulcer, the postoperative mortality rate was 18.92% in the whole series but 41.8% among the elderly.^[13]

Regarding the adopted four-point scoring system in the present study, all our patients were classified as high risk or extremely high risk patients according to the preoperative risk stratification.^[9,10] The overall mortality rate was 5 out of 24 patients (20.8%), with only two postprocedural death (8.3%) that seem to be clearly less than those in conventional surgery^[13] with the same high risk groups. Many studies traced the mortality rate in such patients subjected to conventional surgery and could predict postoperative death with 87% accuracy.^[5]

Failure of the procedure occurred in three patients (12.5%) necessitating open repair of the perforated ulcer and this rate of conversion came in concordance with other study with nonoperative management where 11.5% to 18% of the patients underwent laparotomy after 12 h

of the trial.^[5,15,20] All had unsealed perforations and were true failure of conservative treatment.^[5]

Regarding to the postprocedural complications, we found that intra-abdominal infection including pelvic and right iliac fossa collections, occurred in three patients (12.5%) while in other studies with open repair the wound infection and intra-abdominal abscess were encountered in 12.5% and 13.4% of the patients, respectively^[21] while in non-operative management the incidence of abscess formation was 14.3%.^[15] An interesting recent study tried to improve the outcome of patients with peptic ulcer perforation.^[22] Some of the risk factors for poor outcome can be explained by the septic status of the patient on admission.^[22,23] Accordingly, in order to improve the outcome of patients with peptic ulcer perforation, sepsis needs to be factored into the existing knowledge and treatment.^[7,22] Therefore, proper resuscitation from shock, improving ASA grade, decreasing delay and reserving definitive surgery for selected patients is needed to improve overall results.^[9]

Conclusion

In patients with perforated peptic ulcer, an initial period of nonoperative treatment with careful observation may be safely allowed in certain situations. Percutaneous peritoneal drainage under local anesthesia supported by the conservative measures in high risk elderly patients with perforated duodenal ulcer seems effective when surgery is indicated but carries the high risk of mortality.

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