

Original research article

A study on management of non-traumatic duodenal ulcer perforation at a tertiary care hospital

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Abstract

Acid peptic disorders are group of ulcerative disorders of the gastrointestinal tract involving principally the most proximal position of the duodenum, the stomach, lower end of esophagus, jejunum after surgical anastomosis to stomach or rarely the ileum adjacent to the Meckel's diverticulum due to ectopic gastric epithelium. During the study period 50 cases admitted in our surgery emergency and were studied thoroughly according to the prepared proforma (hence prospective study), proportions, chi square test & student 'T' tests were used to find out the significance and the details were arranged in the master chart for the convenience of presentation. The diagnosis was made by erect x-ray abdomen, patients were categorized according to the MPI scoring system and diagnosis was confirmed on the operation table. Only 54% of treated patients recovered smoothly and whereas remaining 46% had complications which include 10% deaths. Out of 50 patients, 20 had MPI score of less than 21 and among them, only 35% had complications and no death. 27 patients had MPI score of 21-29 and among them, 40.7% had complications and 7.5% died whereas among the patients who had MPI score of more than 29, all died. This relation is found to be statistically significant.

Keywords: Non-traumatic duodenal ulcer perforation, MPI score, acid peptic disorders

Introduction

Since the beginning of recorded medical history human beings have been confronted with the spectra of peritonitis. Accounts from a variety of early societies have little doubt that our ancestors recognized the value of the therapeutic drainage^[1].

In a German translation of the writings of Hippocrates appears the first thorough description of a patient with peritonitis. "The patient looks sick and wasted, the nose is pointed, the temple sunken, the eyes lay deep are rimmed and dull, the face expresses fear, the tongue is furrowed, the skin shiny. The patient avoids all movements and breathes shallow. The abdominal wall is rigid with muscular guarding, no bowel sounds can be heard. The pulse is quick and small. A hard tender mass in hypochondrium is a bad prognostic sign if it involves the whole area. The presence of such a mass at the beginning of the fever indicates that death is imminent". This description is now a days called as "HIPPOCRATES FACIES", and is still used for diagnosis of peritonitis^[2].

Surgeons have attempted for 100yrs to cure the peptic ulcer by reducing the secretion of acid and pepsin, and history of surgery for peptic ulcer is a chronicle of their attempts to achieve this aim without producing major disturbances to the functions of the alimentary tract.

Acid peptic disorders are group of ulcerative disorders of the gastrointestinal tract involving principally the most proximal position of the duodenum, the stomach, lower end of esophagus, jejunum after surgical anastomosis to stomach or rarely the ileum adjacent to the Meckel's diverticulum due to ectopic gastric epithelium^[3].

Approximately 98%-99% of the peptic ulcers occur in the 1st portion of the duodenum or in the stomach. About 5% of the individuals with gastric ulcer develop duodenal ulcer but 20% of those with duodenal ulcers develop gastric ulcers.

The pyloric channel which is 1-2cms in length, is the narrowest portion of the gastric outlet, because of their gastric acid secretory characteristics and clinical features pyloric channel ulcers are grouped with duodenal ulcers rather than gastric ulcers. Ulcers in this location often produce symptoms similar to duodenal ulcers^[4].

The treatment of perforation is still controversial. Just closure of perforation may save life but chance of recurrence is high and patient may not return for 2nd curative surgery. So, there is a school of thought which recommends definitive surgery in a perforated peptic ulcer. This may to certain extent reduce the mortality and morbidity of the patients, because patients have to risk a major operation when the general condition is not good, on the other hand it saves the patient of other surgery^[5, 6].

Since the invention of modern techniques, laparoscopic closure and H.pylori eradication therapy post-operative complications and recurrence rates have been dramatically come down with early diagnosis and effective resuscitation.

In spite of better understanding of disease, effective resuscitation and prompt surgery under modern anesthesia techniques there is still high mortality and morbidity, hence an attempt has been made to analyze the various factors which are affecting morbidity and mortality of patients with peptic ulcer perforation with an intention to compare open versus laparoscopic closure of duodenal ulcer perforation.

Methodology

During the study period 50 cases admitted in our surgery emergency and were studied thoroughly according to the prepared proforma (hence prospective study), proportions, chi square test & student 'T' tests were used to find out the significance and the details were arranged in the master chart for the convenience of presentation. The diagnosis was made by erect x-ray abdomen, patients were categorized according to the MPI scoring system and diagnosis was confirmed on the operation table.

Inclusion criteria

- All patients admitted with non-traumatic duodenal ulcer perforation.

Exclusion criteria

- Patients with traumatic duodenal perforation & all moribund patients with duodenal ulcer perforation.

A detailed history was taken when the condition of the patient is stable. In critically ill patients history was taken after stabilizing the patients were stabilized after resuscitation.

The hospital records were also reviewed to obtain appropriate epidemiological information regarding age, sex, occupation, and clinical presentation, duration of symptoms, past history of chronic duodenal ulcer, investigations and mode of treatment.

In all the cases of peritonitis due to perforation surgery was done to close the perforation and to made the exact diagnosis of site of perforation, in cases where other than duodenal perforation was found even if we were doing in laparoscopic technique it was converted to open method and surgery was proceeded.

Patients whose condition was very poor (shock at the time of presentation) or patient himself refuses surgery, conservative treatment was adopted.

For the patients who presented to the emergency after 24 hrs of onset of symptoms, patients with poor general condition, shock at the time of presentation, patients with MPI score of >29 and with any co-morbid conditions, laparoscopic technique was avoided due to cardiorespiratory instability while on anesthesia.

Examination

All the patients with suspected duodenal ulcer perforation were examined thoroughly and base line findings were recorded, repeated examination of the patient was done during resuscitation and till the diagnosis is confirmed. Tachycardia, tenderness in the epigastrium and abdominal rigidity pointed towards the diagnosis of peritonitis.

I examined all the patients with peptic ulcer perforation as per the proforma, in all the patients complete physical examination to rule out associated disease was done.

Investigations

Only relevant investigations were ordered to save the precious time, which include x-ray erect abdomen, blood grouping and typing, Hb%, BT, CT, blood urea, serum creatinine and urine routine.

Paracentesis

Diagnostic peritoneal tap was done. Fluid drawn was found to be turbid and bile stained indicating duodenal perforation, in cases which presented late to the hospital frank pus and even fecal stained fluids were found.

Scoring was done to assess the preoperative condition and post-operative outcome was done by MPI Scoring system and general condition was assessed as follows,

1. **Good:** Patient is conscious and cooperative.
 - Pulse rate <90/min.
 - BP 120/80mmHg.
 - Urine output good.
 - No associated medical problems like hypertension, diabetes.
 - Mellitus, tuberculosis or myocardial infarction.
2. **Average:** Patient is conscious.
 - Pulse rate is 90-110/min.
 - BP 120/80mmHg.
 - Oliguria.
 - No or any one associated medical illness.
3. **Poor:** Patient is conscious but poorly oriented.
 - Hippocratic facies.
 - Pulse rate >120/min (tachycardia) or low and of low volume.
 - Anuria.
 - Medical illness may or may not be present.

Outcome of the patient (recovery)

- **Good:** Discharge at 7th-9th postoperative day, without intra or postoperative complications.
- **Average:** Intra operative anaesthesia complications, postoperative complications like bronchopneumonia, wound gaping, wound infection but recovery before discharge.
- **Poor:** Patient survived with burst abdomen/enterocutaneous fistula/severe malnutrition.
- **Death:** In the postoperative period.

Results

Table1: Distribution of patients based on type of treatment undergone (surgical technique)

Type of management	Frequency	Percentage
Conservative	01	02
LAP	16	32
Open	33	66
Total	50	100

Out of 50 patients, one patient was treated conservatively (2%). Remaining 49 (98%) underwent surgery and among them 16 had undergone LAP(32%) and 33 had undergone open surgery (66%), out of which 8 were converted from laparoscopic procedure to open technique.

Conversion rate being 33.33%, among these 2 cases were converted because of cardiorespiratory instability while performing lap,1 due to dense adhesions which could not be separated in lap,3 due to system failure(laparoscopic instruments) and 2were due to inexperienced surgeons(trainee had given the chance to do in lap)

Table2: Distribution of patients based on the outcome

Outcome	Frequency	Percentage
Normal recovery	27	54
Recovery with complications & death	23	46
Total	50	100

Only 54% of treated patients recovered smoothly and whereas remaining 46% had complications which include 10% deaths.

Table3: Distribution of patients based on the pattern of outcome

Pattern of outcome	Frequency	Percentage
Normal recovery	27	54
Bronchopneumonia	08	16
Burst abdomen	02	04
Wound infection	08	16

Death	05	10
Total	50	100

Out of 50 treated patients, 54% recovered without any complications whereas 16% had bronchopneumonia, 16% had burst abdomen, 8% had wound infection and 5% died.

Table4: Relation between MPI score and outcome of the patients

MPI score	Recovery without complication	Recovery with complication	Deaths	Total
< 21	13 (65.0%)	07 (35.0%)	00	20 (100%)
21 – 29	14 (51.8%)	11 (40.7%)	02 (7.5%)	27 (100%)
> 29	00	00	03 (100%)	03 (100%)
Total	27 (54.0%)	18 (36.0%)	05 (10.0%)	50 (100%)

Chi-square-29.82DF-4p value-0.00

Out of 50 patients, 20 had MPI score of less than 21 and among them, only 35% had complications and no death. 27 patients had MPI score of 21 – 29 and among them, 40.7% had complications and 7.5% died whereas among the patients who had MPI score of more than 29, all died. This relation is found to be statistically significant.

Table5: Relation between management technique and outcome of the patients

Management technique	Recovery without complication	Recovery with complication	Deaths	Total
Conservative	00	00	01 (100%)	01 (100%)
Open surgery	13 (39.4%)	16 (48.5%)	04 (12.1%)	33 (100%)
LAP	14 (87.5%)	02 (12.5%)	00	16 (100%)
Total	27 (54.0%)	18 (36.0%)	05 (10.0%)	50 (100%)

Chi-square-19.26DF-4p value-0.00

Only one patient was treated conservatively and died. Out of 16 patients who underwent LAP, no one died but only 12.5% developed complications but among the patients who underwent open surgery, 4 died (12.1%) and 16 (48.5%) developed complications. This difference is found statistically significant.

Table6: Relation between shock and outcome of the patients

Shock	Recovery without complication	Recovery with complication	Deaths	Total
Yes	04 (33.3%)	03 (25.0%)	05 (41.7%)	12 (100%)
No	23 (60.5%)	15 (39.5%)	00	38 (100%)
Total	27 (54.0%)	18 (36.0%)	05 (10.0%)	50 (100%)

Chi-square-17.61DF-2p value 0.00

Among the patients presented with shock, 41.7% died and 25% developed complications whereas among patients without shock, 39.5% developed complications and none of them died. This difference is found to be statistically significant.

Table7: Relation between duration of perforation and outcome of the patients

Duration	Recovery without complication	Recovery with complication	Deaths	Total
< 6 hours	02 (40.0%)	03 (60.0%)	00	05 (100%)
6 – 12 hours	05 (55.6%)	04 (44.4%)	00	09 (100%)
13 – 24 hours	15 (75.0%)	05 (25.0%)	00	20 (100%)
> 24 hours	05 (31.3%)	06 (37.4%)	05 (31.3%)	16 (100%)
Total	27 (54.0%)	18 (36.0%)	05 (10.0%)	50 (100%)

Chi-square-15.63Df-6p value-0.16

Among patients who had h/o perforation for more than 24 hours, all of them died

Discussion

In our study patients presenting within 24 hrs. of onset of symptoms, with minimal to moderate distension of abdomen and without presenting in shock are considered for laparoscopic technique, and the post-operative analgesic requirement, hospital stay, complications such as wound infection, gaping & burst abdomen and bronchopneumonia are compared with the patients who underwent open procedure.

In our study out of 50 patients 22 were underwent laparoscopic technique closure, 8 are converted to open technique, out of remaining 16, 2 had bronchopneumonia, none were experienced wound infection or gaping or burst abdomen with 3 to 4 days of analgesics and 5 to 6 days of hospital stay. Among patients who underwent open procedure, 6 had bronchopneumonia, 8 had wound infection, 2 burst abdomen, with 6 to 7 days of analgesics, 13 to 14 days of hospital stay and 5 were died wherein no one

died in laparoscopic technique which may be due to reduced operating time of patients for the laparoscopic procedure.

Out of 8 which were converted to open procedure, 2 is due to the cardiovascular instability during the procedure, 1 is due to adhesions which were dense, 3 were due to instrument failure and another 2 were due to inexperienced surgeon's attempt (trainee student).

The conversion rate in the present study is 33.3% which is comparable with the studies done previously. Hence in a set up where experienced surgeons were available, instruments were good, patients doesn't have comorbid conditions which limits creation of pneumoperitoneum and in patients presenting early (because of less chance of dense adhesions & contamination) laparoscopic technique is superior to conventional open closure.

In a study conducted by Dr. Nita Zaji, in Laparoscopic hospital, New Delhi India July-2007, published in internet had concluded that laparoscopic closure of duodenal perforation is superior to conventional open technique if the patient presents in early stage, if he don't have any co-morbid conditions which limits anesthesia, if the catering hospital is well equipped with instruments required and the surgeon is well trained in laparoscopic procedures^[7].

Our study is compared to the study conducted Sui WT *et al.* & Swiss study lap v/s open duodenal perforation closure, the results of our study is comparable with these studies as shown in the table.

In another study done by M.M. Porecha and co published in internet journal of surgery 2008, the variables are compared with the present study which closely resembles^[8].

Our study results are comparable with other studies^[9, 10], since most of the patients present after 24hrs of onset of symptoms, lack of modern anaesthetic instruments and presence of comorbidities limits the treating doctors to take up the laparoscopic technique as the choice of procedure in our hospital. Laparoscopic closure of duodenal perforation closure is encouraging, in patients who presents within 24hrs of onset of symptoms, relatively younger patients, without any comorbid conditions and if the surgeon is expertised in laparoscopic surgeries.

Conclusion

Patients with MPI score >29 have very high mortality and with MPI 21-29 have significant morbidity and mortality.

Conservative management has high unacceptable mortality & morbidity which can be tried in patients who were in sepsis and have significant contraindications for anesthesia with questionable acceptance.

Simple closure of perforation with long term medical treatment is acceptable in perforated peptic ulcer patients.

Patients who present early, without shock, without concomitant medical illnesses & in younger and middle age group people laparoscopic closure of perforation is superior to open technique if the surgeon is trained well in laparoscopic techniques with good anesthetic equipment and trained anesthetists and good instruments for laparoscopic technique are available.

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