

Laparoscopic versus open repair of Duodenal Perforation

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ABSTRACT:

Perforation is a life threatening complication of peptic ulcer disease. Duodenal Perforation is a common complication of duodenal ulcer¹⁵. The first clinical description of perforated Duodenal Perforation was made by Crisp in 18431. Laparoscopic treatment of perforated Duodenal Perforation was first reported by Mouret in 1989 followed soon after by Nathanson et al.

The incidence of perforated Duodenal Perforation remains the same. Operative treatment of perforated duodenal ulcer consists of time honoured practice of omental patch closure but now this can be done by laparoscopic method . Laparoscopic approaches to closure of duodenal perforation are now being applied widely and may become the gold standard in the future especially in patient with <10mm perforation size presented with in the first 24 hrs of onset of pain. Perforated duodenal ulcer is a surgical emergency. Urgent simple closure of the perforation with omental patching is widely applied for the vast number of these patients the general consensus is to perform simple closure alone without definite procedures especially patients with poor surgical risks and sever peritonitis. Various laparoscopic techniques have been advocated for closing the perforation intra and extra corporeal knots, sutureless techniques, holding the omental patch by fibrin glue or sealing with a gelatin sponge [13], stapled patch closure [5], or gastroscopically aided management in the perforation [1]. Many surgeons has reported patient with sealed perforation by peritoneal lavage and drainage only [16].

Laparoscopic closure of perforation offers important advantages:

1. Decreased post operative pain
2. Less abdominal wall complication
3. Better visualization and ability to carry out a thorough peritoneal lavage.
4. Cosmetically better outcome.
5. Lower intra operative and post operative complications.

6. Early return to work.
7. Early mobilization
8. Lower mortality
9. It is as safe and effective as open surgery
10. Patients subjective well being was better after laparoscopic repair of perforated DU [16].

AIMS:

The aim of this study was to compare the effectiveness and safety of Laparoscopic and Conventional (open) repair of perforated duodenal ulcer. The following parameters were evaluated for both Laparoscopic and open procedures :-

1. Method of patient selection.
2. Operative technique.
3. Operative time.
4. Intra operative and post operative complication.
5. Post operative pain and amount of narcotic used.
6. Time till resumption of diet.
7. Post operative morbidity.
8. Hospital stay.

MATERIALS AND METHODS:

Over a period of one year (2000-2001) 30 Patients with presumptive diagnosis of perforated duodenal ulcer were considered for laparoscopic simple closure with the Graham patch technique the diagnosis was based on clinical presentation (upper abdominal pain, rigidity, tenderness, nausea, vomiting, board like rigidity, tachypoea) investigations done were (Hb%, serum electrolyte, serum amylase, lipase, plain X-Ray of abdomen erect with both domes of diaphragm and left decubitus showing air under diaphragm, ultrasonography to rule out other conditions like, appendicitis, cholecystitis, pancreatitis, endoscopy should be avoided when perforated ulcer is suspected because it could open a sealed perforated ulcer and could extend the peritoneal soiling.

Boey score-risk factor to predict mortality:

RISK FACTORS

SCORE

1. Numbers of hrs since ulcer perforation

24hrs or less 0

More than 24 hrs 1

2. Pre operative systolic BP (mm of Hg)

100 or more 0

Less than 100 1

3. Any one or more systemic illness

(Severe heart disease, severe lung disease,
Renal failure, diabetes mellitus, liver failure)

Absent 0

Present 1

RISK FACTORS MORTALITY

PREDICT RISK OF

One 0%

Two 10-46%

Three 100%

INDICATION FOR LAPAROSCOPIC REPAIR

All duodenal ulcer perforation without extensive peritonitis are indicated for Laparoscopic treatment.

RELATIVE CONTRA INDICATION

1. Elderly patients more than 70 years.
2. Cardiac pathology.
3. Chronic respiratory insufficiency.

4. Obesity.
5. Severe cirrhosis.
6. Severe coagulopathy.

PRE OPERATIVE MANAGEMENT

Foley's catheter and Ryle's tube are inserted, intravenous fluids and broad spectrum antibiotics are administered, electrolyte disturbance if any corrected. Surgery to close the perforation and irrigation of the peritoneal cavity is the traditional therapy for perforated Duodenal Perforation [12]

PATIENT SELECTION

Duodenal perforation is a laparoscopic emergency. If the patient condition is otherwise fit and peritonitis is diagnosed within 12 hours of onset, it is possible to repair the perforation by laparoscopic method. After 12 hrs chemical peritonitis will give way to bacterial peritonitis with severe sepsis and then the laparoscopic repair is not advisable.

OPERATIVE TECHNIQUE

1. General anesthesia.
2. Preparation of patient.
3. Creation of pneumoperitoneum.
4. Insertion of ports.
5. Diagnosis laparoscopy and location of perforation.
6. Cleaning of abdomen.
7. Closure of perforation with omental patch.
8. Irrigation and suction of operating field.
9. Final diagnostic laparoscopy.
10. Removal of instrument with complete exit of co2. Closure of wound.

PATIENT POSITION

Patient placed on the operating table with legs in stirrups. The knee slightly bent and the hips flex (10 degree.). The operating table tilted head up approximately 15 degree. The surgeon stands between the patients leg. The camera surgeon on right side of patient. and assistant surgeon on left side of patient. Four ports are then inserted (10mm) port is placed in umbilicus a

(5-10mm) port inserted in right Upper quadrant (8-10mm) from mid line another (5mm) port in left upper quadrant another (5mm) port is placed at the right subxiphoid region to retract the quadrate lobe of liver. Telescope introduced at (10mm) umbilical port diagnostic laparoscopy was done later on whole abdomen should be irrigated and aspirated with about 10 liters of saline mixed with antibiotics. Each quadrant is cleaned methodically starting at the right upper quadrant, going to the left, moving down to the left lower quadrant, and then finally over to the right. Special attention should be given to the vesicorectal pouch.

Three interrupted stitches are placed and kept without tying the mid line stitch passed through ulcer while another two of them cranial and another one caudal to perforation. The omental flap is mobilized with intact blood supply is placed over perforation and held in place by grasper in the epigastria port which is also used for liver retraction are then tied over omental flap which completely seal perforation. suture material used was vicryl (2-0) .

Through peritoneal lavage is then given with saline irrigation and suction special attention is given to suprahepatic, sub hepatic, left subdiaphragmatic space, pelvic space. After lavage drain is kept in subhepatic space close to perforation in case of general peritonitis second drain is left in the pelvis. After that diagnostic laparoscopy was done again then ports were removed, and (10mm) ports were sutured, then skin was closed by many method. Post operative H2 receptor antagonist or proton pump inhibitor was given with fluid, antibiotics and nasogastric suction.

RESULTS

Laparoscopic duodenal ulcer perforation closure were performed in thirty patients the interval before surgical intervention from the onset of perforation ranged between 20 and 36 hrs. Perforation closure with Graham's patch omentoplasty was performed in all cases. In three patients posterior truncal vagotomy and anterior highly selective vagotomy was combined with perforation closure. Oral fluid was permitted in second POD in 21 patients and others on third and fourth post operative day. Post operative morbidity was very minimal. Two patients had trocar site infection. All the patients were discharged between 5th and 7th post operative day.

DISCUSSION

Though the incidence of peptic ulceration has reduced the management of perforated peptic ulcer remains a challenging disease for the surgeons since it is an emergency procedure. The proper management of this complication of peptic ulcer disease has generated a lot of discussion, laparoscopic surgical treatment of perforated peptic ulcer is an attractive alternative for conventional treatment because of the absence of complications as compared to conventional surgery for patients who develop perforation in the setting of H-pylori infection. Eradication of infection may prevent ulcer recurrence.

Those patients who tolerate insult and ulcer was sealed may be adopted non operative therapy. However decision of non operative therapy is difficult and can be done only after evaluation by and close consultation with an experienced surgeon. If non operative treatment chosen then the patient require frequent clinical examinations so the operative therapy can be done at the first sign of clinical deterioration. A variety of laparoscopic techniques have been described. A combined laparoscopic-endoscopic method described, also mini laparoscopy was described. Intracorporeal suturing was better than extra corporeal knotting because later one is liable to cut

the choice between combining definitive treatment and simple closure is still a matter of controversy the choice depends on certain factors including age, fitness, status of peritoneal cavity. The definitive surgical procedure of choice in perforated duodenal ulcer is patch closure and highly selective vagotomy. Although this procedure has low mortality and morbidity it is technically demanding and requires experienced surgeon to ensure adequate vagotomy.

In this series 30 cases of perforated duodenal perforation three were treated with combined definitive treatment. Older patients with septic shock and generalized peritonitis should better be served by conventional Surgery. Open conversion may be required especially in the presence of certain high risk factors as:

1. Inadequate ulcer localization.
2. Posterior location of gastric ulcer.
3. Pancreatic infiltration (penetrating ulcer)
4. Localized abscess formation

It been shown that the age, presence of concomitant disease and length of free air or fluid collection in abdominal CT Scan correlate with conversion in meta analysis of 13 publication comprising 658 patients Comparing open versus laparoscopic closure of perforated Duodenal Perforation. It was found that post operative pain was lower after laparoscopic repair than open repair supported by significant reduction in post operative analgesic requirement after laparoscopy repair meta analysis demonstrated a significant reduction in wound infection after laparoscopic repair as compared with open. But a significant higher re-operation rate was observed after laparoscopic perforated duodenal repair. Laparoscopic perforated duodenal repair was a safe and reliable procedure associated with short operating time, less postoperative pain, reduced chest complication, shorter postoperative hospital stay and earlier return to normal daily activity than conventional open repair. Operative time also shorter and morbidity also lower in laparoscopic repair of perforated Duodenal Perforation. Also low mortality, better cosmetic outcome with laparoscopic repair also post operative adhesions and incision hernia was lower in comparing with open method. Laparoscopic repair is as safe and effective as open repair. The patients subjective well being was better after laparoscopic repair. Laparoscopy provides better vision of peritoneal cavity, also allow early mobilization.

CONCLUSION

The incidence of peptic ulcer disease has decreased nowadays with vast improvement in medical therapy. However minimal invasive surgery still has a significant role to play in treatment of complicated disease. It decreases hospital stay and overall recovery period as compared to open surgery regardless of the preference of the individual surgeon. Our result have shown that the laparoscopic surgery may become the gold standard for surgical treatment of complicated peptic ulcer disease. Laparoscopic closure of duodenal ulcer perforation is an attractive alternative to conventional surgery with the benefits of minimally invasive surgery such as parietal wall integrity cosmetic benefits and early subjective post operative comfort and rehabilitation.

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