

**A NEW AND SAFER SURGICAL TECHNIQUE FIGURE OF EIGHT STITCH FOR MANAGEMENT OF PERFORATED PEPTIC ULCER**Lalit Choudhary<sup>1</sup>, Abhilasha Jyala<sup>2</sup>, P. K. Jha<sup>3</sup>, Pankaj Kumar Verma<sup>4</sup>, Sudhanshu Kiran<sup>5</sup>**HOW TO CITE THIS ARTICLE:**

Lalit Choudhary, Abhilasha Jyala, P. K. Jha, Pankaj Kumar Verma, Sudhanshu Kiran. "A New and Safer Surgical Technique Figure of Eight Stich for Management of Perforated Peptic Ulcer". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 19, May 12; Page: 5299-5306, DOI: 10.14260/jemds/2014/2591

**ABSTRACT:** There are many methods for closing the perforated peptic ulcer. The technique of closure of perforation by figure of 8 stitch method has been found to be very effective in managing patients with this common problem. **MATERIAL AND METHOD:** The present study was conducted in Unit III of Department of General Surgery, Government Medical College and Dr. Susheela Tiwari Government Hospital Haldwani, from January 2012 to December 2013 on the cases of peptic ulcer perforation peritonitis. All patients with clinical and radiological features and intraoperative findings suggestive of perforated peptic ulcer were included in the study. **RESULTS:** A total of 153 patients were included in the study. Out of these, 128 patients (84%) were males and 25 patients (16%) were females. In 120 patients (78%) there was duodenal perforation and in 33 patients (22 %) gastric perforation was present. Out of these 33 patients, 6 patients had posterior gastric perforation. 140 patients were managed with midline laparotomy and 13 with laparoscopic method, with one converted to open due to presence of posterior gastric perforation. The average time of patient reporting to the emergency was 3-4 days, with earliest reporting time of 2-3 hours and late reporting up to 7-8 days. Age ranged from 15 years to 90 years (average 35 - 45 years). In the postoperative period, 3 patients had leakage from repair site, 7 patients died, rest showed good outcome. **CONCLUSION:** Figure of 8 stitch method showed very good and acceptable result. Therefore, in our opinion this method should be promoted for surgery of perforated peptic ulcer.

**KEYWORDS:** perforated peptic ulcer, figure of 8 stitch, laparotomy, Haldwani.

**INTRODUCTION:** Gastro-duodenal perforations are common in surgical practice and do occur as a complication of peptic ulcer disease (PUD), abuse of non-steroidal anti-inflammatory drugs (NSAIDs) and gastric cancer.<sup>1-6</sup> Alcoholics and smokers are at higher risk.<sup>7,8</sup> Management is quite challenging as patients present late; with septicemia, fluid and electrolyte derangements, shock and or systemic inflammatory response syndrome.

Perforated peptic ulcer is one of the most common acute abdominal condition faced by surgery residents in emergency department. As the disease mostly affects the middle and lower socio-economical class, patients usually present late in course of disease either due to ignorance or due to lack of resources. Another important factor in our study was that most of the patients in our study group belonged to hilly regions where due to lack of transportation facilities the patient took at least 3 - 4 days to reach the hospital, hence the delay.

Dr. Susheela Tiwari Government Hospital is the only single tertiary care centre of Kumaun region of state of Uttarakhand which covers 6 hilly districts (Nainital, Almora, Bagheshwer, Champawat, Pithoragarh and Chamoli) and one plain district (Udham Singh Nagar). In addition patients of nearby districts of UP (Rampur, Moradabad, Bareilly, Bijnor and Badhanyu) too choose to

## ORIGINAL ARTICLE

---

bring their patients to this hospital due to their economical aspects. All these factors lead to a heavy input of patients to this centre.

At present, there are only 3 surgical units functioning under the department of General Surgery in this centre, so we face a huge patient load of emergency as well as elective cases. An average of 1-2 patients of peptic ulcer perforation are routinely faced on daily basis. So when a previously operated indoor patient of perforated peptic ulcer shows some complication in post-operative period, it increases the burden.

Moreover, complications are not so uncommon in cases of perforated peptic ulcer, even at centres with best facilities, because the outcome also depends on certain patient factors too. So in our study, we tried to find out a technique that could decrease the leakage rate from the perforation repair site.

We have only one documented literature on this technique published in Indian Journal of Surgery (A Safer Technique of Closure of Peptic Ulcer Perforation: Indian J Surg (September – October 2011) 73(5):361 – 362 ;).

### **MATERIAL AND METHODS:**

**Study design:** A prospective analytical study was carried out comprising of patients of Perforated Peptic Ulcer.

**Study Place:** Department of General Surgery (under Unit III), Government Medical College and Dr. Susheela Tiwari Government Hospital Haldwani, Nainital.

**Study Period:** January 2012 to December 2013.

**Sample Size:** A total of 153 patients were operated by above technique (140 open + 13 laparoscopically out of which one was converted to open method).

**AIM OF STUDY:** To find out a safe, reliable, easy to apply, economically acceptable method for repair of perforated peptic ulcer.

**Ethical Clearance:** Granted after approval from the ethical committee.

**PROCEDURE:** Patients who had signs of peritonitis and erect abdominal x-ray showing free gas under diaphragm were operated in emergency via mid line laparotomy incision, and some patients who came late in night with very short history and were physiologically stable, were operated with laparoscopic method the next morning. The technique for closure of perforation in both methods was kept the same.

All the patients with on table finding of perforated peptic ulcer (duodenal 1<sup>st</sup> part and gastric perforation both anterior and posterior surface) were included in the study and repair with the figure of eight technique was done.

Patients with history of blunt abdominal trauma leading to perforation of 2<sup>nd</sup> part of duodenum were not included in the study.

## ORIGINAL ARTICLE

All these patients were resuscitated and optimized for surgery with parenteral fluids and antibiotics. Baseline investigations were done in all patients which included complete blood counts, ESR, Serum electrolytes, Renal Function Tests, Liver Function Tests, X - ray chest, X- ray abdomen erect.

**TECHNIQUE:** In most of the cases we observed that the edges of the perforation were very friable, edematous and indurated. In such situation, when the stitches were taken they got cut through the edges.

For such cases, this technique was taken into consideration. The stitch was applied somewhat away from the edge and a figure of eight<sup>9</sup> was made in the following two ways:

The needle was passed into the duodenum/ stomach at some distance away from the perforation margin (Figs. 1, 2, 3, point A), taken out via perforation and then again passed through the perforation and taken out through all layers of the wall of the duodenum/ stomach on the distal side (point B).

Now, these were not tied A and B, but the needle was taken to the proximal side of the perforation (point C) and passed into the duodenum/ stomach again and taken out through the perforation and again passed into the duodenum/ stomach through the ulcer and taken out distally through the duodenal/ stomach wall (point D).

The same could be done by the second method as in figure 4 from A-B-C-D in same manner.

Now, the suture was tied to make it a figure-of-8 between the A and D tail of suture.

This technique was used in all cases and was found to be very effective even in cases of posterior gastric perforation. In cases of a giant perforation, if required, we applied double figure of 8 or additional one or more supporting simple stitches on one or both the sides of the figure-of-8 suture, depending on the size of the ulcer.

This additional stitch or stitches did not tend to cut through because the edges of the ulcer were already approximated by the figure-of-8 stitch. The closed perforation was covered by live omentum patch and sutures were applied to the stomach and the duodenum wall to fix the omentum to cover the perforation area.

The suture material used was mostly vicryl 2-0 round body. In some cases of giant gastric perforation where margins were more indurated, vicryl 1-0 round body was used.

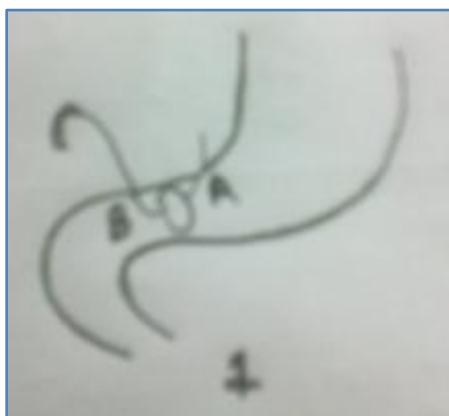
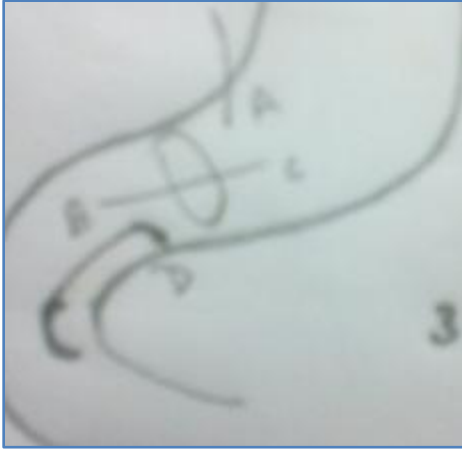


Figure 1

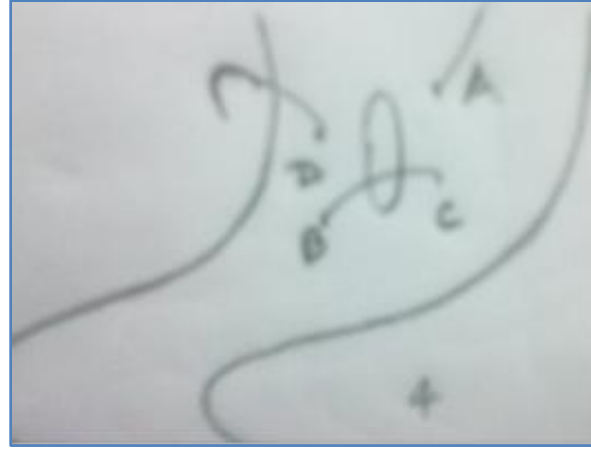


Figure 2

## ORIGINAL ARTICLE



**Figure 3**



**Figure 4**

**OBSERVATIONS AND RESULTS:** A total of 153 patients were included in the study. Out of these, 128 patients (around 84%) were male and 25 patients (16%) were female. In 120 patients (78 %) there was duodenal perforation and in 33 (22 %) gastric perforation out of which 6 patients had posterior gastric perforation. 140 patients were managed with midline laparotomy and 13 with laparoscopic method with one converted to open method due to presence of posterior gastric perforation. The average time of presentation was between 3-4 days, earliest up to 2-3 hours and delayed up to 7-8 days. Age ranged from 15 year to extremes of 90 with an average of 35 - 45 year.

Out of 153 patients, leakage from perforation site occurred only in 3 patients in the 5-7 postoperative day, out of these 2 patients were later diagnosed as advanced gastric malignancy and died due to high output fistulae and wound and malignancy related complications. The 3<sup>rd</sup> patient was an 80 year old lady, and we tried to manage with controlled fistula, but patient went LAMA on 20<sup>th</sup> postoperative day. 5 patients died between 1-7 postoperative day and none of them showed any signs of leakage from perforation site.

These were patients who presented late to us during the course of their disease and collapsed due to respiratory complications and septicemia in the postoperative period.

Most of the patients were discharged between 9-15 postoperative day with PPI and followed up for next 3 months and recovered well.

Laparoscopically treated patients showed excellent recovery and were discharged earlier than the other patients (a well-known benefit of laparoscopic surgery).

In all the units of surgery department, before the implication of this technique, the complications related to perforation was more in comparison to the study group.

Due to the following advantages, this technique could be considered superior to the other methods:

1. Very minimal chance of cut through from margin due to division of the pressure by suture at 2 different direction.
2. Bite can be taken from somewhat away from margin of perforation, also reduces the chance of cut through.
3. Not a difficult technique. Does not require any special training. Easily performed by beginners.

## ORIGINAL ARTICLE

---

4. Inverts the margins of perforation and creates good approximation of margins. Crossing of suture provides platform to central most diseased part of perforation.
5. Also very useful for giant perforation. The problem of obstruction seen with omental plugging for managing giant perforation does not occur with this technique.
6. Also no fear of narrowing of lumen.

**DISCUSSION:** There are various methods of managing the Perforated Peptic Ulcer from conservative to laparoscopic approach. Graham omental patch repair was most widely used till now. Every method has its own advantage and drawback.

**Non-Operative Management:** Conservative treatment is known as the Taylor method and consists of nasogastric aspiration, antibiotics, intravenous fluids and nowadays H. pylori triple therapy.<sup>10, 11</sup>

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.<sup>11,12</sup> The fundamental idea for conservative treatment came from Crisp who in 1843 noted that perforations of the stomach were filled up by adhesions to the surrounding viscera which prevented leakage from the stomach into the peritoneum.<sup>11</sup> But conservative approach has higher mortality.

**Open Surgical Repair Technique:** Either with simple closer of perforation with suture or omental plugging or omental patch repair. C. J. Cellan-Jones in 1929 reported 51 cases of perforated duodenal ulcer treated with a patch of omentum sutured over the perforation.<sup>13</sup> Later, in 1937, Roscoe Graham of Toronto reported 51 cases treated with omental patch closure in essentially the same fashion, though his technique was a transverse rather than a longitudinal positioning of the omental patch (by Cellan-Jones) along the long axis of the duodenal perforation, a modification thought to reduce the incidence of duodenal stenosis.<sup>14</sup> Dragstedt, in 1949, came up with the finding that vagotomy could reduce gastric acid, which paralleled a significant reduction in peptic ulcer diseases.<sup>15</sup> However the addition of a definitive acid reducing procedure at same surgery with the repair of duodenal perforation seems to add to the risk for mortality and morbidity without appreciably improving the long-term outcome.

Laparoscopic Repair either with or without omental patch.<sup>16, 17</sup>

**Newer Technique Like “Stamp Method”** with a patch, made up of lactide-glycolid-caprolactone (LGC) was cut into a circle with a diameter of 1 cm and an overlap of 0.5 cm all around the perforation. The patch was glued on the outside of the stomach with Glubran 2 (n-butyl.<sup>2</sup> cyanoacrylate, methacryloxysulfolane).<sup>18</sup>

This method is still under trial, and successful result observed in rat so far.

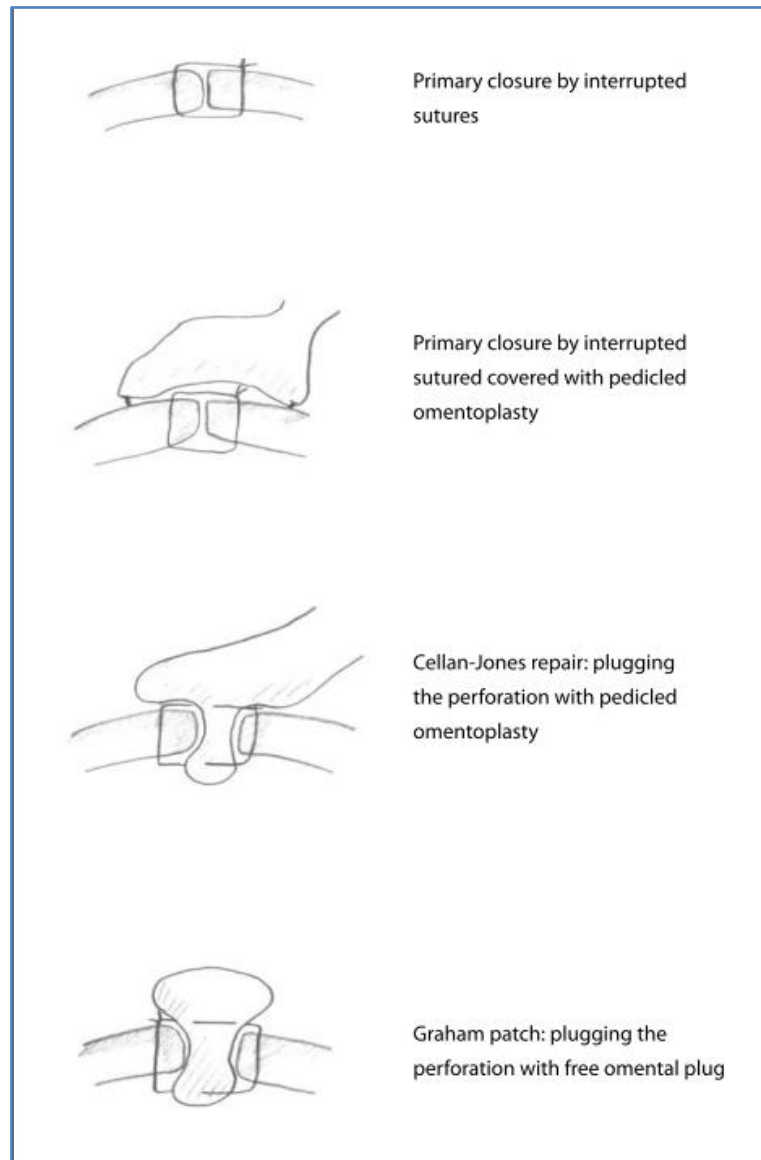
**CONCLUSION:** The main causes of morbidity and mortality in perforated peptic ulcer is usually pneumonitis, septicemia and leak from repair site. Definitive acid reduction and bypass surgery are not possible in these patients due to compromising physiological status of patient and load of septicemia. Laparoscopy although showed promising results but its unavailability at remote areas

## ORIGINAL ARTICLE

and lack of skilled operator are the limitations for its routine use in PPU surgery. So still open technique is being widely practiced.

In our study, figure of 8 stitch method showed very good and acceptable results. Hence, in our opinion this technique should be promoted for surgery of perforated peptic ulcer.

### Diagrammatic Presentation of Various Method of Repair:



**Figure 5**

### REFERENCES:

1. Svanes C. Trends in Perforated Peptic Ulcer: Incidence, Aetiology, Treatment and Prognosis. *World J Surg.* 2000; 24: 277 – 83.
2. Dakubo JC, Naaeder SB, Clegg-Lamptey JN. Gastroduodenal peptic ulcer perforation. *East Afri Med J* 2009; 86(3) 100-9.

## ORIGINAL ARTICLE

---

3. Chalya et al. Clinical profile and outcome of surgical treatment of perforated peptic ulcers in North-western Tanzania: A tertiary hospital experience. *World Journal of Emergency Surgery* 2011; 6:31. (10pages). Available from: [http:// www.wjes.org/content/6/1/31](http://www.wjes.org/content/6/1/31).
4. Gupta S, Kaushik R. The Management of Large perforations of Duodenal Ulcers. *BMC Surgery*. (2005). 5:15.
5. Hill AG. Management of perforated duodenal ulcer. In: Holzheimer RG, Mannick JA, editors. *Surgical Treatment: Evidence-Based and Problem-Oriented*. Munich: Zuckschwerdt; Available from: <http://www.ncbi.nlm.nih.gov/books/NBK6926/>
6. Gisbert JP, Legido J, García-Sanz I, Pajares JM. Helicobacter pylori and perforated peptic ulcer prevalence of the infection and role of non-steroidal anti-inflammatory drugs. *Dig Liver Dis*. 2004; 36(2):116.
7. Rosenstock S, Jørgensen T, Bonnevie O, Andersen L. Risk factors for peptic ulcer disease: a population based prospective cohort study comprising 2416 Danish adults. *Gut* 2003; 52:186-193.
8. Korman MG, Hansky J, Eaves ER, Schmidt GT. Influence of cigarette smoking on healing and relapse in duodenal ulcer disease. *Gastroenterology* 1983; 85: 871-4.
9. Gupta S. P. A Safer Technique of Closure of Peptic Ulcer Perforation. *Indian J Surg* (September – October 2011) 73(5):361 – 362; DOI 10.1007/s12262-011-0336-0
10. Bucher P, Oulhaci W, Morel P, Ris F, Huber O. Results of conservative treatment for perforated gastroduodenal ulcers in patients not eligible for surgical repair. *Swiss Med Wkly* 2007, 137(23-24):337-340.
11. Donovan AJ, Berne TV, Donovan JA. Perforated duodenal ulcer: an alternative therapeutic plan. *Arch Surg* 1998, 133(11):1166-1171.
12. Conservative management of perforated peptic ulcer. *The Lancet* 1989, 16:1429-1430.
13. Cellan – Jones C.J. A Rapid Method of Treatment in Perforated Duodenal Ulcer. *British Medical Journal*. 1929; 1: 1076-7.
14. Graham RR. The Treatment of Perforated Duodenal Ulcers. *Surg Gynaecol Obstet*. 1937; 64: 235 – 8.
15. Dragstedt LR. Vagotomy for Gastroduodenal Ulcer. *Ann. Surg*. 1949; 122: 973 – 89.
16. Lau H. Laparoscopic repair of perforated peptic ulcer: a meta-analysis. *Surg Endosc* 2004; 18:1013-1021.
17. Bergamaschi R, Marvik R, Johnsen G, Thoresen JE, Ystgaard B, Myrvold HE. Open vs. laparoscopic repair of perforated peptic ulcer. *Surg Endosc* 13:679–682.
18. Bertleff MJ, Liem RS, Bartels HL, Robinson PH, Van der Werff JF, Bonjer HJ, Lange JF. The “stamp method”: a new treatment for Perforated Peptic Ulcer? *Surg Endosc*. 2006 May; 20(5):791-3. Epub 2006 Mar 16.

**AUTHORS:**

1. Lalit Choudhary
2. Abhilasha Jyala
3. P. K. Jha
4. Pankaj Kumar Verma
5. Sudhanshu Kiran

**PARTICULARS OF CONTRIBUTORS:**

1. Junior Resident, Department of Surgery, Government Medical College, Haldwani.
2. Junior Resident, Department of Surgery, Government Medical College, Haldwani.
3. Associate Professor, Department of Surgery, Government Medical College, Haldwani.
4. Associate Professor, Department of Surgery, Government Medical College, Haldwani.

5. Junior Resident-2, Department of Surgery, Government Medical College, Haldwani.

**NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:**

Dr. Lalit Choudhary,  
Room No. 42,  
S. R. Hostel,  
GMC, Haldwani,  
Nainital-263139, Uttarakhand.  
Email: bhadu.lalitdr@gmail.com

Date of Submission: 22/04/2014.  
Date of Peer Review: 23/04/2014.  
Date of Acceptance: 28/04/2014.  
Date of Publishing: 12/05/2014.