

**Research Article**

## A Comparative Study of Different Techniques Used For Closure of Peptic Ulcer Perforation at Tertiary Center in Western Rajasthan

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**Dr Sunder Kishor**Email: [drs.kishor@gmail.com](mailto:drs.kishor@gmail.com), Ph: 9460483136**Abstract**

*Peptic ulcer perforation was found to be more common in the middle age, male, chronic smokers and alcoholics. Among the common aetiological factors leading to peptic ulcer perforation are prolonged use of non steroidal anti inflammatory drugs (NSAIDs), or other drugs causing gastro-duodenal mucosal injury or pre-existing peptic ulcer disease. preoperative shock and long standing perforation (more than 48hr) are the risk factors that significantly contributed to mortality. Degree of peritoneal contamination was a major contributing factor in morbidity and mortality. Mostly cases had anterior wall duodenal perforation. Sudden release of gastric and duodenal contents into the peritoneal cavity through a perforation leads to a devastating sequence of event which, if not managed properly, is likely to cause death. The technique used in group C i.e. figure of 8 suture with application of omental patch over it was found to be more effective and reliable by the fact that it had lesser postoperative complications, no leakage, lesser hospital stay and no mortality as compared to other two groups. Thus, the technique of figure of 8 sutures should be used as a better surgical option in the treatment of perforated peptic ulcer.*

**Introduction**

Perforation of peptic ulcer with peritonitis is a common surgical emergency in India. There has been substantial decline in elective operation for peptic ulcer disease following introduction of H2 blockers and proton pump inhibitors but perforated peptic ulcer still remains a dramatic surgical emergency which necessitates operations. The laparotomy and closure of perforation remains the mainstay of treatment unless contraindicated. There are several variations in the

technique of closure of peptic ulcer perforation. The technique of closure of perforation by figure of 8 was found to be effective in dealing with this common problem (Gupta, 2011). This technique has been found to decrease the chances of re-leakage of perforation.

**Aims and Objectives**

The object to conduct this study were as follows:

1. To evaluate the risk factor e.g. age, sex, personal habits i.e. NSAID intake, smok-

ing, alcoholism, duration of perforation, gross peritoneal contamination and shock.

2. To evaluate the preoperative and postoperative management.
3. To evaluate the different techniques of closure of peptic ulcer perforation.

### Material and Methods

The study included all the patients admitted in the Department of Surgery, S.P. Medical College and associated P.B.M. Hospital, Bikaner diagnosed to have perforated peptic ulcer and operated for the same.

A detailed clinical history of all the patients was taken which include history of illness, past history of acid peptic disease, history of NSAID intake and other associated disorders. Patients' life style and habits were noted as per standard proforma.

Study of all the routine investigations with relevant diagnostic investigations like X-ray flat plate abdomen erect posture, chest X-ray PA view etc. were done and different techniques of closing the perforation were studied.

### Observations & Discussion

This study was conducted to evaluate the cases of peptic ulcer perforation with different techniques for closure of peptic ulcer perforation. This prospective study included 50 cases of perforated peptic ulcer managed in the Department of Surgery, S.P. Medical College and Associated P.B.M. Hospital, Bikaner.

#### Age incidence

Majority of patients were between 41-50yrs age group in the present study. The minimum age was 23yrs and maximum age was 87 years. According to Jordan (1988) current peak age for perforation is between 40-49yrs.

Sillakivi (2000) observed a mean age of 45.5yrs.

In our study, mean age was 47.36 years which is close to Jordan (1988) and Sillakivi (2000).

#### Sex incidence

In present study of 50 cases of peptic ulcer perforation, 98% were males and 2% were females.

Kalpesh Jani et al. (2000) reported 88% were males in their study.

Sillakivi (2000) observed in his study that 82% were male and 18% were female patients.

Jordan (1988) found that perforated peptic ulcers are still more common in men than in women.

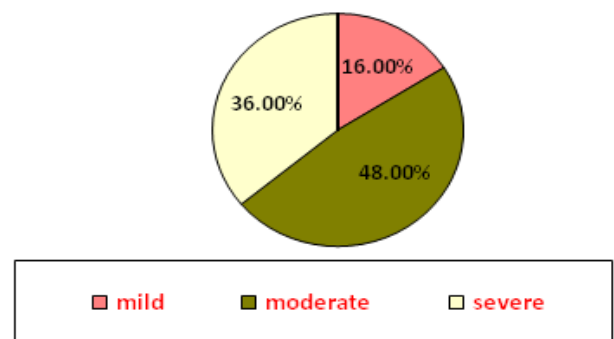
All above findings suggest male predominance for peptic ulcer perforation.

#### Degree of peritoneal contamination

In our study, various degree of peritoneal contamination was noted. According to Horowitz et al. (1989) degree of peritoneal contamination was divided into 3 grades that is mild (<500ml), moderate (500-1000ml) and severe (>1000ml).

In present study 48% cases had moderate and other 36% cases had severe peritoneal contamination.

It was observed that the patients who had severe contamination had presented late (>48hrs) after onset of symptoms. Thus the peritoneal contamination increases with the time passed after perforation and this contributes to the various postoperative complications.



Gouder et al. (2010) found that mortality was higher in massive contaminated cases.

Sriram (2013) mentioned that small perforation presents with subacute features but in 24 to 48 hrs, diffuse peritonitis sets in.

#### Methods of closure of perforation

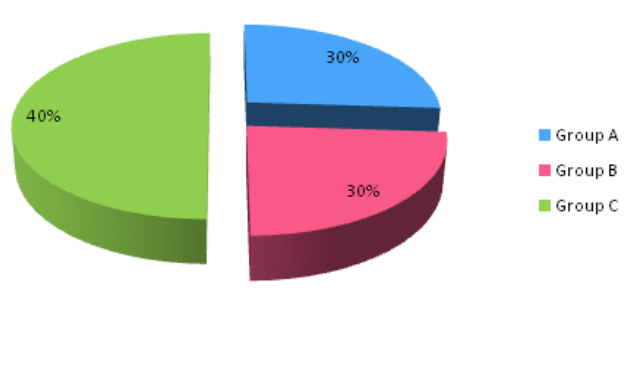
In present study, three methods of closure of perforation were studied.

Group A – Simple closure with omental patch

Group B – Closure with omental plug

Group C – Figure of 8 suture with omental patch

In this study there were 15 cases in group A, 15 cases in group B and 20 cases in group C were studied.



In all cases, silk (2-0, atraumatic RB) was used.

**Table-1 Duration of hospital stay (n=48)**

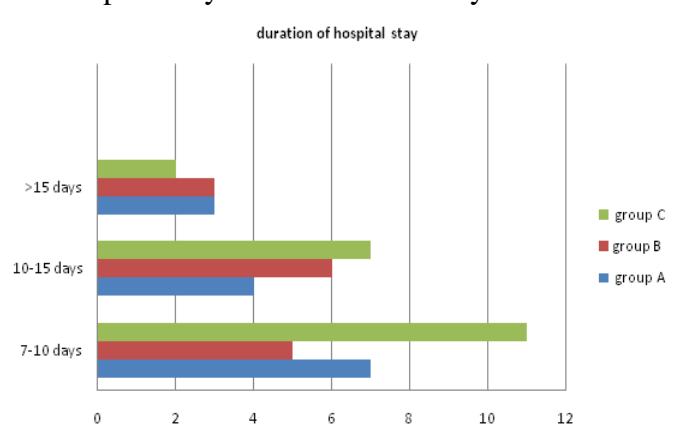
S.No.	Duration of hospital stay(days)	Simple closure with omental patch (group A) (n=15)	Omental plug (Group B) (n=15)	Figure of 8 technique with omental patch (Group C) (n=20)	Total	%
1	7-10	7(46.66%)	5(33.33%)	11(55%)	23	46
2	11-15	4(26.66%)	6(40%)	7(35%)	17	34
3	>15	3(20%)	3(20%)	2(10%)	8	16

The table shows that mostly patients were discharged between 7-10 days (46%).

In 8 cases, stay in hospital was >15 days.

Most of the patients of group C (55%) had hospital stay of less than 10 days as compared to group A and group B in whom only 46.66% and 33.33% cases respectively could be discharged in this duration.

Only 10% cases of group C had stay of more than 15 days while 20% in each group A and group B had hospital stay of more than 15 days.



Datsis et al. (2003) concluded in their study that simple closure of perforated chronic duodenal ulcer in combination with postoperative H. pylori eradication, seems to be an accepted treatment, so the immediate acid reduction surgery (vagotomy) in the contaminated environment caused by perforation, is probably unnecessary.

Kulkarni and Kshirsagar (1998) found that mortality was 7.5% among the patients who were surgically treated with simple closure of perforation with omental patch.

**Postoperative complications**

In our study, overall most common complication was mild wound infection in postoperative period (18%). Mild wound infection was most common in group B (26.66%), followed by in group A (20%) and lesser percentage in group C (10%). Second most common complication was fever (12%). Fever occurred in lesser percentage of cases in group C (5%) as compared to group A (20%) and B (13.33%).

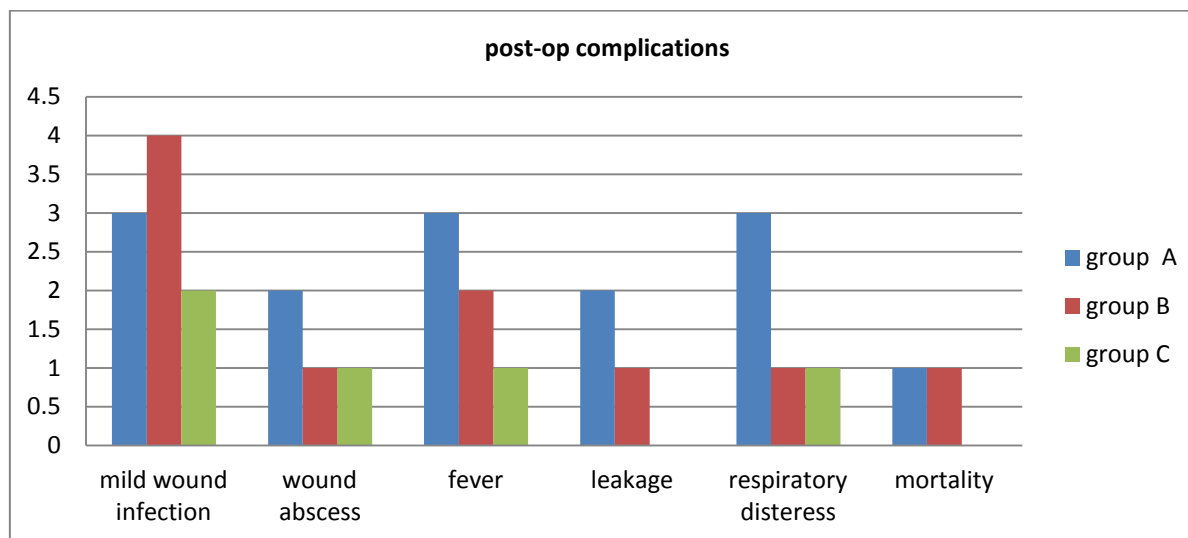
Respiratory distress was 3<sup>rd</sup> most common complication (10%) and occurred in 3 cases in group A and one case each in B and C groups.

Wound abscess occurred in 2 cases of group A and one case each in group B and C.

Leakage occurred in 2 cases of group A, one case of group B and none in group C. Two cases of leakage were kept on conservative treatment along with total parenteral nutrition. One case was reoperated and gastrojejunostomy done in this patient.

**Table-2** Postoperative complications (n=50)

S.No.	Postoperative complication	Group A (n=15)	Group B (n=15)	Group C (n=20)	Total
1	Mild wound infection	3	4	2	9
2	Wound abscess	2	1	1	4
3	Leakage	2	1	-	3
4	Fever	3	2	1	6
5	Respiratory distress	3	1	1	5
6	Mortality	1	1	-	2



Magshoudi and Ghaffari (2011) found that in 4% cases out of 422 patients experienced generalized peritonitis after leakage of peptic ulcer perforation repair and it significantly increased mortality.

Boey et al. (1982) reported 45 complications in 28 patients with post operative pneumonia (10 cases) being the most common complication followed by respiratory failure (7 cases) and wound sepsis (6 cases).

Sillakivi (2000) reported 114 complications in 70% patients in his study. Wound sepsis was the most common complication reported.

**Mortality**

In our study, the overall mortality was 4%. Mortality was one each in group A (6.66%) and B (6.66%) while no mortality occurred in group C.

In group A, the patient presented late (>48 hrs) with preoperative shock. Intra operatively, size of perforation was 1cm with severe peritoneal contamination was there and the patient died due to septicemia.

In group B, the patient also presented late (>48hrs) with preoperative shock. Intra operatively size of perforation was 1cm with severe peritoneal contamination and the patient died due to respiratory septicemia.

**Table-3** Mortality in various groups

S.No.	Group	Age (yrs)	Duration between perforation and operation	Complicating factor				Interval between operation and death(days)	Cause of death
				Pre-op shock	Associated disorder	Size of perforation	Peritoneal contamination		
1	A(n= 15) 1(6.66%)	64	>48 hrs	+	-	1cm	severe	1	Septicemia
2	B(n= 15) 1(6.66%)	73	>48 hrs	+	-	1cm	Severe	3	Septicemia
3	C(n=20)	-	-	-	-	-	-	-	-

Mishra et al. (2003) mentioned 10.7% postoperative mortality in their study.

Boey J et al. (1982) reported 4.2% postoperative mortality in their study which was very similar to present study.

Sillakivi et al. (2000) in their study reported 5.6% mortality in surgically treated perforated peptic ulcer. This finding is also close to findings of our study.

The following advantages were found with figure of '8' technique:

The suture can be taken from a relatively longer distance by even a small needle.

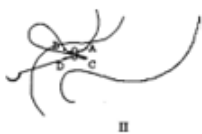
There is lesser tendency to cut through because the pressure at one point is divided into two directions, and the pressure is exerted on four points instead of two points. When a simple stitch is applied, there are more chances of cut through the friable and oedematous walls because pressure is directed towards one point.

The edges of the ulcer do not tend to evert by the effect of the figure-of-8 stitch and approximation of edges has been found to be satisfactory.

The cross of the figure-of-8 comes over and supports the most friable and oedematous central part of the ulcer.



• **Fig. 1-**First step of closure of peptic ulcer perforation



• **Fig. 2-**Second step of closure of perforation to make figure-of-8



• **Fig. 3-**Closure of peptic perforation by figure-of-8 suture completed

## Conclusion

The present study was conducted in 50 cases of peptic ulcer perforation, operated upon in the Department of surgery, P.B.M. Hospital Associated with S.P. Medical College, Bikaner (Raj.).

In the present study, all patients were operated in emergency operation theatre.

The incidence of perforation was found to be the highest in the age group of 41-50 yrs.

The disease almost exclusively involved males i.e. 98% cases. Only 2% were female.

Habits of patients were found to be significantly influencing the incidence of peptic ulcer perforation. 66% of the patients were smoker and 58% were alcoholic. Non steroidal anti-inflammatory drugs played a significant role i.e. history was present in 62% cases.

Abdominal tenderness, guarding/rigidity and absent bowel sounds were very important signs in these cases and were present in 100%, 96% and 100% cases respectively. Liver dullness obliteration was another very important finding which was found in 92% cases and which could clinch the diagnosis. 26% of the cases had preoperative shock and required immediate resuscitation.

On X-ray flat plate abdomen in standing position, gas under diaphragm was present in 92% cases and thus it was the main diagnostic investigation.

Mostly patients had severe (>1000cc) peritoneal contamination i.e. 36% cases. 48% cases had moderate peritoneal contamination i.e. 500-1000cc.

Only 14 % cases had gastric perforation, rest all cases (86%) had duodenal perforation.

In the present study, closure of perforation was done by three techniques: Group A – simple closure of perforation first and then application of live omentum over the closed perforation (done in 15 cases). Group B- three or more stitches pass from one side of perforation to opposite side, then live omentum is placed over perforation site and then stitches tied over the omentum (done in 15 cases). Group C- perforation closed by figure of 8 suture and then live omentum applied over closed perforation (done in 20 cases).

Postoperative complications were lesser in group C as compared to group A and B. Mild wound infection (26.66%) was the most common complication in present study followed by fever (12%) and respiratory distress (10%).

Leakage was the major and significant postoperative complication and was present in two cases of group A and one case of group B. No leakage was present group C.

Overall mortality was 4%; one each in group A and B while no mortality occurred in group C. Both the cases who expired had perforation operation interval of >48 hrs, both had preoperative shock and peritoneal contamination was severe. The cause of death in both cases were septicemia.

The technique used in group C i.e. figure of 8 suture with application of omental patch over it was found to be more effective and reliable by the fact that it had lesser postoperative complications, no leakage, lesser hospital stay and no mortality as compared to other two groups. Thus, the technique of figure of 8 sutures should be used as a better surgical option in the treatment of perforated peptic ulcer.

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