

Original Research Article

A study of peptic ulcer perforation with special reference to evaluation of figure of '8' suture technique for closure of peptic ulcer perforation

Dr. Sunder Kishor¹, Dr S.P. Gupta²

¹Assistant Professor, Dept. Of General Surgery, S.P. Medical college, Bikaner, Rajasthan, India

²Professor, Dept. Of General Surgery, R.N.T. Medical college, Udaipur, Rajasthan, India

*Corresponding author

Dr. Sunder Kishor

Email: drs.kishor@gmail.com

Abstract: The incidence of peptic ulcer perforation was found to be more common in the middle age, male and in non-vegetarians. Smoking, alcohol and NSAIDs use played significant role in peptic ulcer perforation. Perforation was commonest in "O" blood group cases. Degree of peritoneal contamination was a major contributing factor in morbidity and mortality. Mostly cases had anterior wall duodenal perforation. 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.

Keywords: peptic ulcer, Smoking, alcohol, duodenal perforation.

INTRODUCTION

Perforation of peptic ulcer with peritonitis is a common surgical emergency in India. Despite advances in the surgical techniques, antimicrobial therapy and intensive care support, management of perforation peritonitis continues to be highly demanding, difficult and complex. The laparotomy and closure of perforation remains the mainstay of treatment unless contra indicated. There are several conventional options for dealing with perforated duodenal ulcer. 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 [1]. This technique has been found to decrease the chances of re-leakage of perforation.

AIMS AND OBJECTIVES

The object to conduct this study was as follows:

- To evaluate the risk factor e.g. age, sex, personal habits i.e. NSAID intake, smoking, alcoholism, duration of perforation, gross peritoneal contamination, and shock and associated other illness.
- To evaluate the preoperative and postoperative management.
- To evaluate the different methods of closure of peptic ulcer perforation with special reference to figure of 8 technique.

MATERIAL AND METHODS

The study included all the patients admitted in the Department of Surgery, RNT Medical College, and Maharana Bhupal Hospital, Udaipur, 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 and serum electrolytes etc. were done.

Different methods of closing the perforation were studied with special reference to figure of 8 technique of its closure.

OBSERVATIONS & DISCUSSION

This study was conducted to evaluate the cases of peptic ulcer perforation with special reference to evaluation of figure of '8' suture technique for closure of peptic ulcer perforation". This prospective study included 50 cases of perforated peptic ulcer managed in the Department of Surgery, R.N.T. Medical College and Associated Maharana Bhupal Hospital, Udaipur.

Age incidence

Majority of patients were between 41-50yrs age group in the present study. The minimum age was 20yrs and maximum age was 89 years.

According to Jordan [2] current peak age for perforation is between 40-49yrs.

Sillakivi [12] observed a mean age of 45.5yrs.

In our study, mean age was 47.36 years which is close to Jordan [2] and Sillakivi [12].

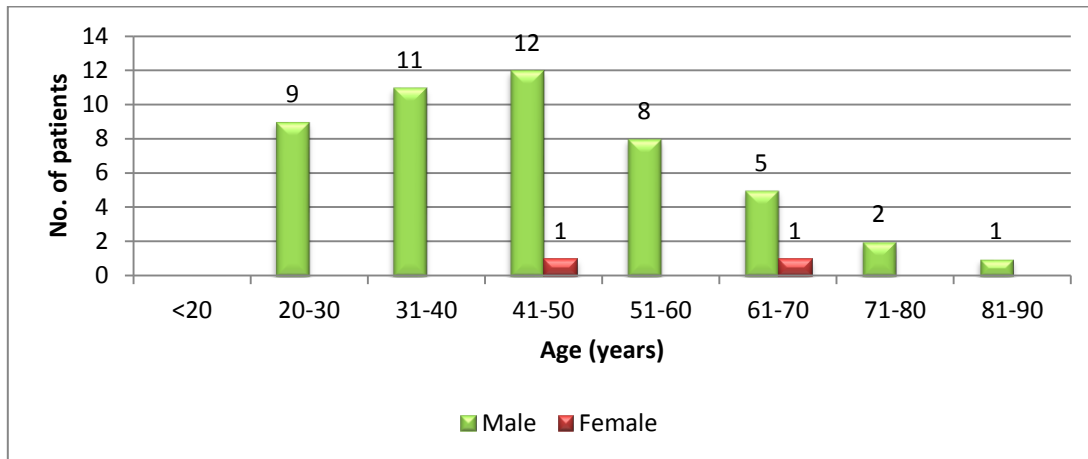


Fig-1: Age distribution

Sex incidence

In present study of 50 cases of peptic ulcer perforation, 96% were males and 4% were females.

Kalpesh Jani *et al.* [3] reported 88% were males in their study.

Sillakivi [12] observed in his study that 82% were male and 18% were female patients.

Jordan [2] found that perforated peptic ulcers are still more common in men than in women.

All above findings suggest male predominance for peptic ulcer perforation.

Blood group

In our study, 44% cases of peptic ulcer perforation occurred in O+ve blood group, followed by 26% in B+ve blood group. AB-ve blood group was not found in any case.

Table-1: Blood group (n=50)

S.No.	Blood group	Rh	Male	Female	Total	%
1	A	+ve	7	-	7	14
		-ve	1	-	1	2
2	B	+ve	13	-	13	26
		-ve	2	-	2	4
3	AB	+ve	3	-	3	6
		-ve	-	-	-	-
4	O	+ve	20	2	22	44
		-ve	2	-	2	4

Rains and Ritchie [4] have mentioned that persons of blood group O are 3 times more likely to suffer from peptic ulcers as compared to other blood groups.

In our study also, peptic ulcer perforation was more common in O+ve Blood group cases i. e. 44 %.

Degree of peritoneal contamination

In our study, various degree of peritoneal contamination was noted. According to Horowitz *et al.* [5] degree of peritoneal contamination was divided in to 3 grades that is mild (<500ml), moderate (500-1000ml) and severe (>1000ml).

In present study 44% cases had moderate and other 44% cases had severe peritoneal contamination.

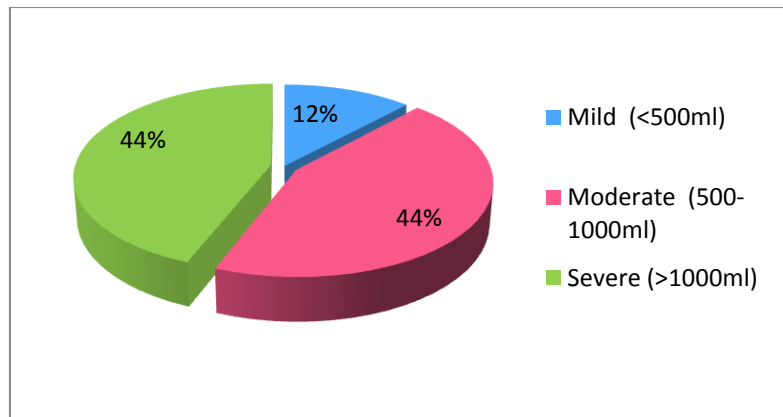


Fig-2: Degree of peritoneal contamination

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.* [6] found that mortality was higher in massive contaminated cases.

Sriram [7] 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 13 cases in group A, 12 cases in group B and 25 cases in group C were studied.

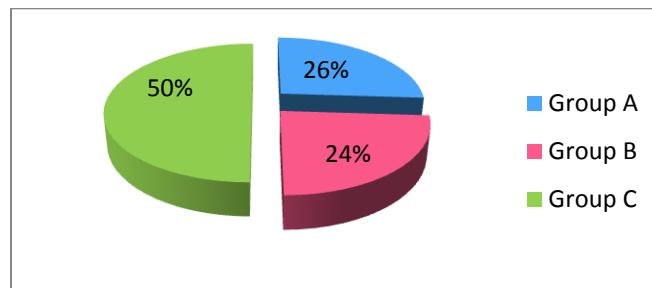


Fig-3: Methods of closure of perforation

In all cases, silk (2-0, atraumatic RB) was used except in one case of group B, in whom perforation was repaired with vicryl (2-0, atraumatic RB).

In one patient of group A, feeding jejunostomy was also done because of relatively larger size of gastric perforation.

Datsis *et al.* [8] 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 [9] 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 respiratory distress in postoperative period (16%). Respiratory distress was most common in group B (41.66%), followed by in group A (15.38%) and lesser percentage in group C (4%). Second most common complication was fever (10%). Fever occurred in lesser percentage of cases in group C (4%) as compared to group A (23.07%) and B (8.33%).

Mild wound infection was 3rd most common complication (6%) and occurred in one case each in all 3 groups.

Wound abscess occurred in one case each in group A and B but none of the case of group C had wound abscess.

Leakage occurred in one case of group A and none of the case of group B and group C had leakage. This case of leakage was kept on conservative treatment

along with total parenteral nutrition. The case recovered and was discharged.

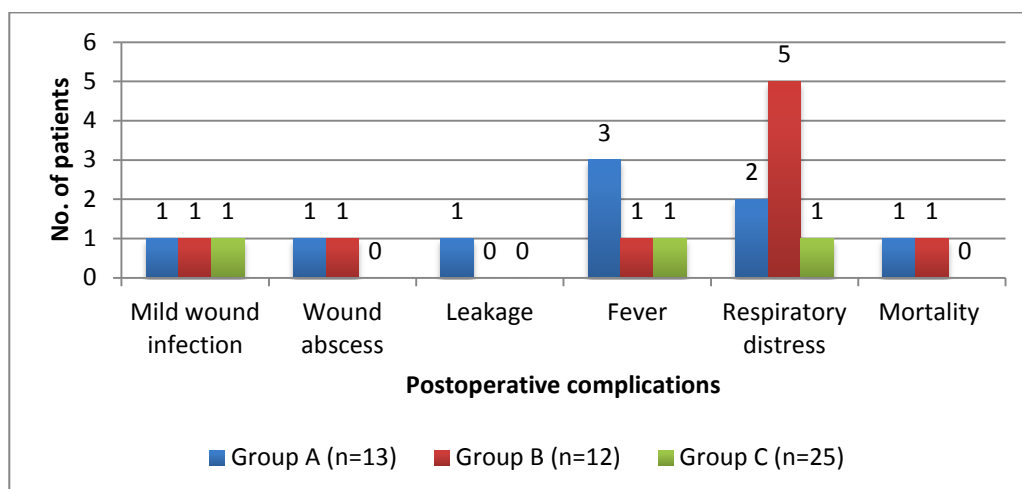


Fig-4: Postoperative complications

Magshoudi and Ghaffari [13] found that in 4% cases out of 422 patient’s experienced generalized peritonitis after leakage of peptic ulcer perforation repair and it significantly increased mortality.

Boey *et al.* [10] 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 [12] 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 (7.69%) and B (8.33%) 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 and had associated respiratory disorder (COPD). Intra operatively size of perforation was 1.5cm with severe peritoneal contamination and the patient died due to respiratory failure.

Table-2: Mortality in various groups

S.No.	Group	Case no.	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= 13) 1(7.69%)	30	55	>48 hrs	+	-	1cm	severe	1	Septicemia
2	B(n= 12) 1(8.33%)	45	70	>48 hrs	+	COPD	1.5cm	Severe	3	Resp. Failure
3	C(n=25)	-	-	-	-	-	-	-	-	-

Mishra *et al.* [11] mentioned 10.7% postoperative mortality in their study.

Boey J *et al.* [10] reported 4.2% postoperative mortality in their study which was very similar to present study.

Sillakivi *et al.* [12] 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. I-First step of closure of peptic ulcer perforation

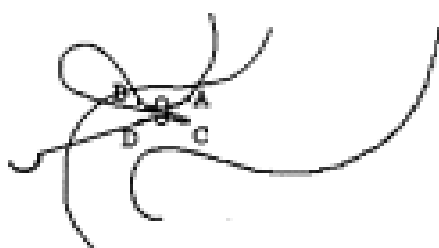


Fig. II-Second step of closure of perforation to make figure-of-8

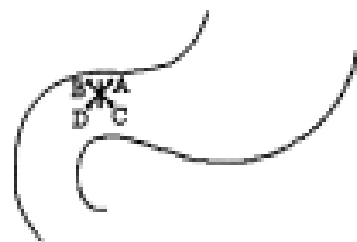


Fig. III-Closure of peptic perforation by figure-of-8 suture completed

CONCLUSION

The present study was conducted in 50 cases of peptic ulcer perforation, operated upon in the Department of surgery, Maharana Bhupal Hospital Associated with R.N.T. Medical College, Udaipur (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. 96% cases. Only 2 cases out of 50 were female.

Habits of patients were found to be significantly influencing the incidence of peptic ulcer perforation. 74% of the patients were smoker and 52% were alcoholic. Non steroidal anti-inflammatory drugs played a significant role i.e. history was present in 60% cases.

All the patients presented with complaint of pain abdomen which was moderate to severe in nature and in all cases started in epigastric region. Patients presented with vomiting in 72% and constipation in 74% cases. Fever was associated in 22% cases.

Abdominal tenderness, guarding/rigidity and absent bowel sounds were very important signs in these cases and were present in 100%, 98% and 100% cases respectively. Liver dullness obliteration was another very important finding which was found in 88% cases and which could clinch the diagnosis. 28% 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 88% cases and thus it was the main diagnostic investigation.

Mostly patients had severe (>1000cc) peritoneal contamination i.e. 44% cases. Similar number of cases had moderate peritoneal contamination i.e. 500-1000cc.

Only 10 % cases had gastric perforation, rest all cases (90%) 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 13 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 12 cases). Group C- perforation closed by figure of 8 suture and then live omentum applied over closed perforation (done in 25 cases).

Postoperative complications were lesser in group C as compared to group A and B. Respiratory distress (16%) was the most common complication in present study followed by fever (10%) and mild wound infection (6%).

Leakage was the major and significant postoperative complication and was present in only one patient of group A. No leakage was present in group B and group C.

Overall mortality was 4%; one each in group A (7.69%) and B (8.33%) 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 one case was septicemia and in second case it was due to respiratory failure.

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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