Volume 03, Issue 02 (May-June 2020), PP 01-06 **www.ijmsdr.org**
ISSN: 2581-902X

International Journal of Medical Science and Dental Research

Laparoscopic repair versus open repair for perforated peptic ulcers
Is figure of eight suture safe?

Yahya Çelik[1], OzanAndaç Erbil[1]

1- Health Ministry, Gebze Fatih State Hospital, General Surgery Clinic, Kocaeli, Turkey

ABSTRACT

Aim

Recent meta-analysis comparing laparoscopic repair and repair with open method were indecisive about the preference of a certain method.

The aim is to compare the results of our patients who have undergone laparoscopic or open PUP repair and to investigate if it's safe to close PUP area by easy-to-apply figure of eight suture.

Material and method

The patients who were operated laparoscopically or by open method for peptic ulcus perforation between June 2012 and December 2018 were included in this retrospective study. Omentoplasty was done after the primary repair of PUP focus in open method cases. Omentoplasty was done by figure of eight suture in laparoscopic cases. The age and sex of the patients, type of operation, duration of operation, follow up period, duration of hospital stay, time to return to normal activities, post-op early and late complications were examined. Exclusion criteria was as follows: Iatrogenic perforations, traumatic perforations, perforations with bleeding, ASA IV patients, late cases who were symptomatic >24 hours, patients with a perforation focus >1 cm.

Results

A total of 49 patients were included into study; 42 of them were male (85,7%) and 7 female (14.3%). Laparoscopy was used in 27 patients (55.1%) and open method in 22 (44.9%). In 3 patients (6.1%) wound site infection, in 1 patient (2.1%) subileus, in 1 patient (2.1%) incisional hernia, in 1 patient trocar site (2.1%) hernia have been observed. Wound site infection, subileus, incisional hernia and trocar site hernia were compared according to the type of operation and there was no significant difference. Duration of hospital stay (4,7±1,2 days) was shorter with laparoscopic method compared to open method (6,1±1,3 days) (p=:0,001). Similarly, by laparoscopic method return to work (11,30±1,75 days) was shorter than open method (20,59±2,42 days) (p<0,001)..

Conclusion

Laparascopic PPU treatment is a safe method. It can be applied safely with easy-to-apply figure of eight suture in uncomplicated cases.

Keywords;Laparoscopicrepair, Perforatedpepticulcer, Simple closure

I. Introduction

In the last 30 years eradication of helicobacter and increased use of proton pump inhibitors have substantially decreased the incidence of peptic ulcer [1]. However, complications due to peptic ulcer such as bleeding and perforation haven't decreased at the same level[2, 3]. Peptic ulcer perforation is still a common complication of peptic ulcer. PUP treatment is usually performed by upper abdominal laparotomy [4, 5]. After introduction of laparoscopic procedure by Mouret et al. in 1989 for peptic ulcer perforation, it becomes increasingly the treatment of choice.[6]. Recent meta-analysis comparing laparoscopic and open repear method were indecisive about the preference of a certain method[7-9]. It's known that laparoscopic procedures decrease post-op wound problems and adhesions and shorten post-op pain, duration of hospital stay and time to return to the normal daily activities. However, there are studies reporting that duration of operation is longer and re-leakage risk is higher with laparoscopic PUP[10].

The aim of this study is to compare the results of our patients who have undergone laparoscopic or open PUP repair and to investigate if it's safe to close PUP area by easy-to-apply figure of eight suture.

II. Material and method

The patients who were operated laparoscopically or by open method in our hospital for peptic ulcus perforation between June 2012 and December 2018 were included. After the approval of local ethics committee, the age and sex of the patients, type of operation, duration of operation, follow up period, duration of hospital stay, time to return to normal activities, post-op early and late complications were examined from the hospital records. Exclusion criteria were as follows: Iatrogenic perforations, traumatic perforations, perforations accompanied by bleeding, ASA IV patients, late cases who were symptomatic >24 hours, patients with >1 cm perforation focus. There was no criterion for preferring laparoscopic or open method. The method was chosen by the surgeon.

Before the operation plain abdominal radiography, chest X-ray and abdominal CT was obtained and thus diagnosis was established.Preoperative approval was obtained from all patients. In the open method supraumbilical median incision was used to enter the abdomen. Perforation area was closed by 3/0 vicryl by using seperate sutures. Omentum patch was pulled over the suture line and fixed. In laparascopic method the patients was positioned in 15 degree reverse Trendelenburg position. The operator was located in between the legs of the patient and camera holder was located at the left side of the patient. The abdominal entry was infraumbilical and open method was used. 30^0 optic was used. After confirmation of the diagnosis, 3 additional working trocars were placed: a 5 mm trocar in the right subcostal region at the anterior axillary line, a 5 mm trocar in the left subcostal region at the midclavicular line and a 5 mm trocar in the midline between umbilicus and xyphoid.After detecting perforation, the omentum was prepared. Figure of eight suture was performed by 3/0 round-body vicryl. Omentum was placed between perforation and suture and tied. Intraabdominal fluid suction was performed in both methods. It was flushed by 3 l isotonic solution. Suction catheter was placed into subhepatic area and Douglas. Nasogastric tube was inserted. Post-op iv. fluid, analgesics, PPI inhibitor treatment were used. After active bowel sounds were heard nasogastric tube was withdrawn and oral fluid was given.

Statistical analysis were performed by SPSS version 17.0 program. Histogram graphics and Kolmogorov-Smirnov test was used to analyze the conformity of variables with normal distribution. While presenting descriptive analysis mean, standard deviation and median values were used. Categorical data were compared by using Pearson $\chi 2$ and Fisher's Exact Tests. In assessment of variables with normal distribution (parametric variables) between groups T test was used in independent groups and variables with non-normal distribution (non-parametric variables) were assessed between groups by using Mann Whitney U Test. P-value <0.05 was considered as statistically significant.

III. Results

A total of 49 patients were included into the study, 42 (85.7%) of them were males and 7 (14.3%) female. Laparoscopic procedure was done in 27 (55.1%) patients and open method was used in 22 (44,9%) patients. The mean time after the operation was 4,1±1,7 years. The mean operation duration was 86,3±28,6 minutes. Mean duration of hospital stay was 5,4±1,4 days. The mean time to return to work was 15,5±5,1 days. Complications: wound site infection in 3 patients (6.1%), subileus in 1 patient (2.1%), incisional hernia in 1 patient (2.1%), trocar site hernia in 1 patient (2.1%) (table 1) , (table 2). With laparoscopic method duration of hospital stay (4,7±1,2 days) was shorter than open method (6,1±1,3 days) (p=0,001) Similarly, by laparoscopic method time to return to work (11,30±1,75 days) was shorter than open method (20,59±2,42 days) (p<0,001).

Age, follow up period, duration of operation, duration of hospital stay, time to return work have been compared in terms of type of operation. With laparoscopic method duration of hospital stay (4,7±1,2 days) was shorter than open method (6,1±1,3 days) (p=0,001). Similarly, time to return to work was shorter with laparoscopic method (11,30±1,75 days) compared to the open method (20,59±2,42) (p<0,001). (table 3)

Presence of wound site infection, subileus, incisional hernia, trocar site hernia was compared in terms of type of operation and there was no significant association.

IV. Discussion:

It has been reported that in peptic ulcer perforations laparoscopic surgery has several advantages over open surgery such as lower incidence of wound site infection, shorter duration of hospital stay, early return to normal daily activities, presence of less post-op pain[11, 12]. In our study, statistically significant shorter duration of hospital stay and shorter time to return to work was observed in laparoscopic group. In perforated peptic ulcer repair post-op complications of open and closed methods should be compared in terms of mortality, need for re-operation and leakage. There are studies reporting higher rates of leakage from the repaired area with laparoscopic procedure [10, 13-15]. There are technical difficulties in laparoscopic method while repairing peptic ulcer area. As in the open repair placing omentum after 3 sutures is the most difficult stage in the laparoscopic method. Fragility of the tissue and tangling of the threads may make this stage more difficult. Larger ulcer, edema around perforation margins, scar tissue due to the ulcer at the base increase the likelihood of the suture cutting the tissue. Closing the area by using omental patch may ease the tying procedure. Cellan-Jones have used omental patch method for the rapid repair of peptic ulcer perforations by open method [16]. This technique was modified and used also in closed method in addition to the open method. There are few studies reporting use of omental patch along with simple closure technique in laparoscopic method [17, 18]. There are studies using easy-to-apply figure of eight suture [19]. In a prospective study carried out by Changole et al. omentopexy and figure of eight suture was compared. In the figure of eight suture group earlier initiation of oral food intake, earlier recovery, shorter duration of hospital stay and less wound site infection rate has been reported [20].

In our study, we have used in our laparoscopic cases easy-to-apply figure of eight suture along with omental patch. In the open method after primary closure omental patch was placed. The complications were similar with both methods. As the result in our study confirmed easy-to-apply figure of eight suture is as safe as other methods. However, since we excluded late cases and ASA IV patients we cannot comment on the safety of figure of eight suture in these patients.

In the earlier years of laparoscopic surgery higher rate of leakage, complication rates and longer duration of operation have been reported [21]. However, technological developments and improvements and increased surgical experience have decreased the rate of complications in laparoscopic peptic ulcer perforation repair and shorten the duration of operation[9]. In our study, complication rate and duration of operation were similar in open and laparosopic methods.

In conclusion, laparascopic PPU treatment is a safe method. In uncomplicated cases, easy-to-apply figure of eight suture can be safely used.

References

[1.] Xia, B., et al., *Trends in the prevalence of peptic ulcer disease and Helicobacter pylori infection in family physician-referred uninvestigated dyspeptic patients in Hong Kong.* Alimentary pharmacology & therapeutics, 2005. **22**(3): p. 243-249.

[2.] Wang, Y.R., J.E. Richter, and D.T. Dempsey, *Trends and outcomes of hospitalizations for peptic ulcer disease in the United States, 1993 to 2006.* Annals of surgery, 2010. **251**(1): p. 51-58.

[3.] Thorsen, K., et al., *Epidemiology of perforated peptic ulcer: age-and gender-adjusted analysis of incidence and mortality.* World Journal of Gastroenterology: WJG, 2013. **19**(3): p. 347.

[4.] Lunevicius, R. and M. Morkevicius, *Risk factors influencing the early outcome results after laparoscopic repair of perforated duodenal ulcer and their predictive value.* Langenbeck's archives of surgery, 2005. **390**(5): p. 413-420.

[5.] Lau, H., *Laparoscopic repair of perforated peptic ulcer: a meta-analysis.* Surgical Endoscopy and Other Interventional Techniques, 2004. **18**(7): p. 1013-1021.

[6.] Mouret, P., et al., *Laparoscopic treatment of perforated peptic ulcer.* British Journal of Surgery, 1990. **77**(9): p. 1006-1006.

[7.] Zhou, C., et al., *An updated meta-analysis of laparoscopic versus open repair for perforated peptic ulcer.* Scientific reports, 2015. **5**: p. 13976.

[8.] Ge, B., et al., *A prospective randomized controlled trial of laparoscopic repair versus open repair for perforated peptic ulcers.* Surgery, 2016. **159**(2): p. 451-458.

[9.] Quah, G.S., G.D. Eslick, and M.R. Cox, *Laparoscopic repair for perforated peptic ulcer disease has better outcomes than open repair.* Journal of Gastrointestinal Surgery, 2019. **23**(3): p. 618-625.

[10.] Bertleff, M.J. and J.F. Lange, *Laparoscopic correction of perforated peptic ulcer: first choice? A review of literature.* Surgical endoscopy, 2010. **24**(6): p. 1231-1239.

[11.] Tan, S., et al., *Laparoscopic versus open repair for perforated peptic ulcer: a meta analysis of randomized controlled trials.* International Journal of Surgery, 2016. **33**: p. 124-132.

[12.] Vakayil, V., et al., *Surgical repair of perforated peptic ulcers: laparoscopic versus open approach.* Surgical endoscopy, 2019. **33**(1): p. 281-292.

[13.] Lunevicius, R. and M. Morkevicius, *Systematic review comparing laparoscopic and open repair for perforated peptic ulcer.* British Journal of Surgery: Incorporating European Journal of Surgery and Swiss Surgery, 2005. **92**(10): p. 1195-1207.

[14.] Lunevicius, R. and M. Morkevicius, *Management strategies, early results, benefits, and risk factors of laparoscopic repair of perforated peptic ulcer.* World journal of surgery, 2005. **29**(10): p. 1299-1310.

[15.] Lee, F., et al., *Selection of patients for laparoscopic repair of perforated peptic ulcer.* British journal of surgery, 2001. **88**(1): p. 133-136.

[16.] Cellan-Jones, C., *A rapid method of treatment in perforated duodenal ulcer.* British medical journal, 1929. **1**(3571): p. 1076.

[17.] Ellatif, M.A., et al., *Laparoscopic repair of perforated peptic ulcer: patch versus simple closure.* International Journal of Surgery, 2013. **11**(9): p. 948-951.

[18.] Lin, B.-C., et al., *Laparoscopic repair of perforated peptic ulcer: simple closure versus omentopexy.* journal of surgical research, 2017. **220**: p. 341-345.

[19.] Yoon, J.J., et al., *Laparoscopic Single Figure of Eight Suturing Omentopexy for the Treatment of a Perforated Duodenal Ulcer.* Journal of Minimally Invasive Surgery, 2019. **22**(1): p. 23-28.

[20.] Changole, S., M. Soni, and D. Thakare, *Peptic perforations: comparative study of its closure (omentopexy versus figure of 8 closure).* International Surgery Journal, 2019. **6**(6): p. 2074-2079.

[21.] Bertleff, M.J. and J.F. Lange, *Perforated peptic ulcer disease: a review of history and treatment.* Digestive surgery, 2010. **27**(3): p. 161-169.

Table 1

		n	%
Sex	Male	42	(85,7)
	Female	7	(14,3)
Type of operation	Laparascopic	27	(55,1)
	Duodenum Open	22	(44,9)
wound site infection	No	46	(93,9)
	Yes	3	(6,1)
Subileus	No	48	(97,9)
	Yes	1	(2,1)
İncisional hernia	No	48	(97,9)
	Yes	1	(2,1)
Trocar site hernia	No	48	(97,9)
	Yes	1	(2,1)

Table 2

	Mean	s.d.	Median
Age	36,88	±15,22	32,00
Follow up period	4,04	±1,71	4,06
Duration of operation	86,33	±28,56	90,00
Duration of hospital stay	5,35	±1,39	5,00
Time to return to work	15,47	±5,10	13,00

Table 3

	Type of operation						p[1]
	Laparaskopic Laparoscopic			Open method			
	Mean	s.d.	Median	Mean	s.d.	Median	
Age	36,7	±13,1	31,0	37,1	±17,8	32,0	0,643
Follow up period	4,3	±1,8	4,1	3,7	±1,6	4,0	0,193[2]
Duration of operation	92,9	±26,9	90,0	78,9	±29,1	72,5	0,071[2]
Duration of hospital stay	4,7	±1,2	5,0	6,1	±1,3	6,0	**0,001**
Time to return to work	11,3	±1,8	11,0	20,6	±2,4	21,0	**<0,001**

[1]Mann Whitney U Test [2]Independent T Test