

ABOUT CHOICE OF METHOD IN SURGICAL TREATMENT OF PERFORATED DUODENAL ULCER**STEPANYAN S.A.^{1,2*}, PETROSYAN A.A.¹, EGHIAZARYAN H.H.¹, ALEKSANYAN A.YU.¹, SAFARYAN H.H.¹, MANVELYAN G.A.¹**¹Department of Surgery 1, Yerevan State Medical University, Yerevan, Armenia²Clinic of Surgery, Republican Medical Center "Armenia", Yerevan, Armenia*Received 06/20/2014; accepted for printing 10/21/2014***ABSTRACT**

In this study we evaluated the results of the treatment of perforated duodenal ulcer. Both operative methods – open and laparoscopic are used.

In period 2010-2014 78 patients were operated for perforation of duodenal ulcer. Of them 16 (20.5%) were female and 62 (79.5%) – male. Their age ranged between 21 and 56 years, with an average of 37.5 years. In 52 patients (66.7%) perforation was the first manifestation of peptic ulcer disease. In 37 cases laparoscopic repair was performed, in 2 patients conversion to an open repair was made. In 39 patients operation was started with laparotomy.

All laparoscopic procedures were performed following the French position. In laparoscopic surgery group simple closure was performed in 7 (19%) patients, excision and perforation suture – in 5 (13.5%) patients, epiploonoplasty – in 10 (27%) patients, omental patch repair – in 15 (40.5%) patients. In laparotomy group simple closure was performed in 35 (85.4%) patients, epiploonoplasty and omental patch repair – in 6 (14.6%) patients.

The operative time in laparoscopic group was between 45-130 minutes, with an average of 70 minutes. We used intra- and extracorporeal methods of knots. No death was registered in hospital and one month after operation in laparoscopic group. One death was registered in laparotomy group.

Bowel transit was started in 2-4 days after operation in both groups. The mean duration of hospital stay was 5 days in laparoscopy and 7 days in laparotomy group. The patients treated laparoscopically, received 60% less analgetics, 50% less antibiotics, consumed 70-80% less dressings.

The study shows that laparoscopic method of treatment of perforated duodenal ulcers is safe with no risk of residual intraperitoneal abscess. We note the advantage of decreasing postoperative pain, abdominal wall infections, reduction of antibiotherapy and material consumption. We have considered that laparoscopic approach is method of choice in treatment of perforated duodenal ulcers.

KEYWORDS: *peptic ulcer disease, perforated duodenal ulcer, laparoscopy, laparoscopic repair of perforated ulcer.*

INTRODUCTION

In the list of complications of peptic ulcer disease perforation is the second [Brunicardi F. et al., 2005]. The free perforation into abdominal cavity is more common and dangerous, than atypical and hidden types. Perforation occurs in 5% of patients with peptic ulcer disease [Siewert J., 2001]. This

complication often occurs in young men but because of increasing smoking rate in women and wide use of non-steroidal anti-inflammatory drugs (NSAIDs) in all age groups, it can occur in all adult population. Over 20% of old patients over the age of 60 admitted to hospitals with diagnosis of peptic ulcer perforation are taking NSAIDs [Brunicardi F. et al., 2005]. Until now, high mortality and morbidity rates are associated with perforation of peptic ulcer disease. Seventy percent of deaths among patients with peptic ulcer disease

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refer to perforation [Kashiwagi H., 2007]. In the group of patients with in-hospital perforation the mortality rate is 5-24% [Svanes C., 2000; Thorsen K. et al., 2011]. One-year mortality in patients with perforated peptic ulcer is up to 30% [Imhof M. et al., 2008; Bonin E. et al., 2012].

The perforation of duodenal or gastric ulcer into the free abdominal cavity is an absolute indication for operation. Choices of operation methods are simple suturing or closure with omental patch of perforation hole with or without ulcer excision, with or without vagotomy on one side, and partial gastrectomy with or without vagotomy on the other. For duodenal ulcers (localization in bulbus of duodenum) simple closure or excision of ulcer with stitching are common [Siewert J., 2001].

Simple patch closure alone is a method of choice in patients with hemodynamic instability and/or exudative peritonitis with history of perforation over 24 hours. In the rest of patients the possibility of a definitive ulcer operation (high selective proximal vagotomy or vagotomy with distal partial gastrectomy) should be considered. Now in USA and Western Europe there is an obvious trend to refuse the definitive operation in perforated duodenal ulcer, and it is still considered to be reasonable to perform proximal selective vagotomy in most stable patients with a perforated duodenal ulcer, especially in those with chronic history, and in those who are unlikely to be compliant with *H. pylori* treatment, or who require treatment with NSAIDs. Before the period of *H. pylori* eradication treatment only 30% of patients with perforated duodenal ulcer treated by simple closure had good long-term results. Now, simple closure of perforated duodenal ulcer results in satisfactory long-term results when *H. pylori* infection (present in 50 to 75% of patients with perforated duodenal ulcer) is eliminated [Brunnicardi F. et al., 2005]. Up to 80% of perforated duodenal ulcers are *H. pylori* positive [Motewar A. et al. 2013].

The first laparoscopic suturless repair for perforated duodenal ulcer was performed by Mouret et al. (1990). They used fibrin glue and covered the hole of perforation with omental patch [Mouret P. et al. 1990].

Nathanson L. et al. (1990) reported the first successful laparoscopic suture repair for perfo-

rated peptic ulcer [Nathanson L. et al., 1990].

The concept of sutured closure is the laparoscopic counterpart to the open technique, whereas non-sutured repair does not require laparoscopic suturing skills and has the advantage of shorter operative time [Law W. et al., 1995].

Simple closure of the perforation with an omental patch is the most common management approach in many institutions during the last decades. It is technically easy and reliable and is also the preferred method for high-risk patients [Collier D., Pain J., 1985; Turner W. et al., 1988; Bornman P. et al., 1990].

MATERIALS AND METHODS

In the period of 2010-2014 78 patients with perforated duodenal ulcer were operated in the Clinic of surgery of Republican Medical Center "Armenia". Of them 16 (20.5%) were female and 62 (79.5%) – male. Their age ranged between 21 and 56 years, with an average of 37.5 years. The preoperative diagnosis was confirmed by clinical signs (pain, muscle contraction), and radiological signs (pneumoperitoneum). In 52 patients (66.7%) perforation was the first manifestation of peptic ulcer disease. All operated patients had symptoms of peritonitis. In 12 patients only upper part of peritoneal cavity was involved in peritonitis, small amount of effusion was detected. In 3 cases the perforation site was covered with liver (in two patients) and omental patch (in one patient) at the moment of operation. In 15 patients generalized peritonitis with moderate liquid quantity was detected. In 51 patients generalized severe peritonitis with purulent effusion was detected. Only 26 (33.4%) patients were admitted in hospital in first 6 hours after the moment of perforation.

Thirty-seven patients (47.4%) underwent laparoscopic repair of perforated duodenal ulcer, conversion was performed in 2 patients: due to difficult identification of the perforation site in one patient, and difficulties in process of ulcer suturing in the other. Operation started with laparotomy in 39 cases. In the group of open repair were 41 (52.6%) patients. Patients undergoing laparoscopic operations were younger, the duration of acute symp-

toms among them was shorter, they were ASA I and ASA II. The ASA III and IV patients were in the group of open surgery. All laparoscopic procedures were performed following the French position. The pneumoperitoneum pressure ranged between 12-14 mm Hg. In 28 patients (75.7%) four trocars were used, in 9 patients (24.3%) – five trocars. In all patients of laparotomy group upper midline incision was performed.

In the group of laparoscopic surgery simple closure was performed in 7 (19%) patients, excision and perforation suture – in 5 (13.5%) patients (Fig. 1), epiploonoplasty – in 10 (27%) patients, omental patch repair – in 15 (40.5%) patients (Fig. 2).

In the group of laparotomy simple closure was performed in 35 (85.4%) patients, epiploonoplasty and omental patch repair – in 6 (14.6%) patients.

In laparoscopic operations laparoscopic equipment and instruments “Karl Storz” (“Karl Storz”, Germany), “AutoSuture” (“AutoSuture”, USA) were used. We used “Caprofil 3-0” or “PDS3-0” (“Ethicon”, USA) with atraumatic needle for perforation closure.

In all the operations peritoneal lavage with saline and meticulous toilet was performed. For drainage of peritoneal cavity tree to four tubes were utilized. Tubes were placed in right subhepatic and left subdiaphragmatic regions, and in small pelvis. Thorough of abdominal cavity was performed.

RESULTS

In first 14 cases of laparoscopic repair the free edge of great omentum or epiploon was pulled into lumen of duodenum with transparietal stitch, then the perforation was closed with one or two stitches. In this method the edge of omentum or epiploon closed perforation site like a plug. In other cases of laparoscopic repair one or two threads were set at a distance from ulcer edges, stitches were made by joining the edges, putting them into contact, and with or without omentum or epiploon patch. In cases of ulcer excision, perforated ulcer was removed with hook connected with monopolar coagulation.

In all cases of laparotomy and conversion, perforated ulcer was sutured with 2-3 threads, with or without omental or epiploon patch.

The operative time in laparoscopic group varied between 45-130 minutes, with an average of 70 minutes. We used intra- and extracorporeal methods of knots. No death was registered in the hospital and one month after operation in laparoscopic group. One death was registered in laparotomy group.

Bowel transit was started in 2-4 days after operation in both groups. The mean duration of hospital stay was 5 days in laparoscopy and 7 days in laparotomy group. Patients received liquid food in second-third postoperative days.

Postoperative complications in laparoscopy group were abdominal wall infection in 2 (5.4%), duodenal fistula in 2 (5.4%) cases. In last 2 cases we could treat patients conservatively, we kept na-



FIGURE 1. Fragment of perforation hole stitching process.



FIGURE 2. The perforated ulcer is closed and covered with omental patch.

sogastric tube and made active aspiration from subhepatic drainage tube during 7 days. The following complications occurred in laparotomy group: abdominal wall infection was registered in 4 (9.8%) cases. No duodenal stenosis was registered within 4 years after the operation.

The patients were treated laparoscopically, received 60% less analgetics, 50% less antibiotics, consumed 70-80% less dressings.

DISCUSSION

Perforation continues to be a dangerous complication of peptic ulcer and requires an emergency surgical treatment. Open method of operation is reliable until now and gives perfect results, but is traumatic for this procedure. For simple closure of perforation hole traumatic laparotomy is performed.

In laparoscopic group, we prefer French position as more comfortable and handy to get the site of perforation and work there.

The number of trocars depends on surgeon's experience. After first 5-6 operations surgeon uses less trocars than before. Now we perform this operation with four trocars. Method of extracorporeal knots allows us to use less trocars too. For handy performance of extracorporeal knots we used the trocars "Endopath Xcel" ("Ethicon", USA).

The type of thread is very important for closure of perforation. Taking into account that edges of perforation hole are fragile, and we do not want to leave there foreign body-thread, it is important to use monofilament, absorbable material with atraumatic round /taper/ needle. Such thread materials as "Caprofil" and "PDS" are successfully used for various anastomoses in abdominal and thoracic surgery.

Duration of operations depends on surgeon's experience and severity of peritonitis. Operating time was longer in first cases, and with acquiring experience this time gradually becomes shorter. The operation time was longer, when we used intracorporeal method of knots. When we used ex-

tracorporeal knots, this method influenced significantly on duration of procedure, it became shorter in 1,2-2 times. In small perforations with small diameter of the hole (3-5 mm), simple suture was sufficient. In cases of large perforation hole and fragile edges epiplonoplasty and omentoplasty were necessary.

The laparoscopic procedure was completed in 37 patients, in 2 patients required conversion. The causes of conversion were difficulties in identification of perforation site and some technical aspects of suturing. Both 2 conversions were among first 5 operations in this field. We have to note – the major part of operations was performed during night duty.

We think peritoneal lavage to be sufficient in laparoscopic procedures; it allows to perform meticulous cleaning of all parts of abdominal cavity. Some difficulties in cleaning of peritoneal cavity occur in patients with adhesions there. In patients without previous intraabdominal operations laparoscopic lavage is more efficient than in open surgery; minimal invasive method allows a more successful exploration of peritoneal cavity than via upper median laparotomy. The postoperative results were as good as in diffuse peritonitis; laparoscopic method allowed efficient performance of peritoneal lavage and cleaning.

Laparoscopic method of operation allows early physical activity and early feeding of patients. Postoperative hospital stay was shorter than after laparotomy.

CONCLUSION

Our study shows that laparoscopic method of treatment in perforated duodenal ulcers is safe with no risk of residual intraperitoneal abscess. We noted the advantage of decreasing postoperative pain, abdominal wall infections, reduction of antibiotherapy and material consumption. We consider the laparoscopic approach to be a method of choice in treatment of perforated duodenal ulcers.

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