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A 9-year Experience of Laparoscopic Herniorrhaphy at Fort Prajaksilapakom Hospital

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Abstract

Objective: **This study was to review the overall outcome of the laparoscopic totally extraperitoneal (TEP) repair for inguinal hernia during the past 9 years.**

Methods: **This retrospective study was undertaken in 107 patients with 119 hernial defects. A single surgeon had used TEP approach from March 2000 - October 2008. The medical records were reviewed in the following data categories: gender, age, weight, duration of symptom, diagnosis, underlying condition, previous surgery, operation time, number of staples, drain applying, complication, and follow up time.**

Results: **The average age of 107 patients was 60.1 years old. There were 98 unilaterals and 9 bilaterals. The indirect hernia was in 93 patients (78.1%) and direct hernia was in 26 patients (21.9%). Of 119 hernia repairs there were 3 patients converted to open herniorrhaphy (2.8%) and one of these three had small bowel injury (0.9%). The recurrence was occurred in 1 patient (0.9%). The mean operation time was 72.74 minutes (40-160), LOS 2.85 days (1-8). The complication rate was 18.9% (20 patients), most of them were minor conditions such as small hematoma (10), seroma (2), and subcutaneous emphysema (1). There was no mortality with an average 38.8 months follow up (1-106 months).**

Conclusion: **The TEP approach was successful, highly safe and efficient due to significant low recurrent rate and no mortality while comparing to either other laparoscopic hernioplasty or open tension free repair. However, the outcomes were dependent on how to select patients, the expertise of surgeon, and surgical technique modification.**

Key words: **extraperitoneal repair, inguinal hernia, laparoscopic herniorrhaphy**

INTRODUCTION

Herniorrhaphy is a very common surgical procedure in daily surgeons' tasks. Nowadays, there have been various approaches in standard practices to repair inguinal hernia. The effective result of an individual procedure is assessed by 2 aspects; recurrence and complication.[2] The principle of repair should have tension-free techniques and preperitoneal approaches.[1] There have been many literatures showing decreasing rate of chronic groin pain by using mesh replacement. Lichtenstein repair has lately gained popularity due to such tension free with mesh graft and impressive result. The laparoscopic herniorrhaphy (LH) also fits with the two basic principles of inguinal hernial repair. The recent studies indicated the impressive results of LH comparing to the Lichtenstein repair.[3,4]

Recently, many surgeons have used the laparo-

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scopic herniorrhaphy more often because of low recurrent and complication rates. In addition, the accepted indications of TEP are bilateral hernia and recurrent case whereas the contraindication is infection. However, many studies suggested that the patient's history of previous lower abdominal surgery was the relative contraindication.[2,5] Most Thai surgeons do not prefer the LH technique, probably due to long learning curve and high laparoscopic skill. There were 2 studies[6,7] citing the possible number for learning curve should be 30-40 cases while other reports disagreed but could not clarify the definite figure.[8]

The author has performed LH for 12 years and intended to evaluate the overall outcomes of this technique. Consequently, this report was already beyond the learning curve.

Materials and Methods

In the Fort Prajaksilapakom Hospital which is a 200-bed regional military hospital, there were 196 patients treated for inguinal hernia during March 2000 and October 2008. Eighty nine patients were operated by open herniorrhaphy because of limited insurance benefit, acute incarcerated hernia with possible strangulation, and age younger than 30 years. Thus, the remaining 107 patients were included in this study. The medical records were reviewed for the following data categories: gender, age, weight, diagnosis, duration of symptom, underlying diseases, previous abdominal surgery, operative time, the number of staples, drain applying, complication and follow up time. One hundred and five patients received general anesthesia while the other two patients received epidural block. All patients were operated by the author.

During preoperative care all patients had urinary decompression by insertion of Foley catheter. The prophylactic antibiotics were not routinely administered. The other active underlying diseases had to be stable in all patients the day before surgery. The author used balloon dissector (butterfly shape) to create the extraperitoneal space during the first few years. The smaller oval shape balloon dissector had been used lately. During the past 2 years, the author used his own index finger to build up tunnel without balloon dissector. The three-port technique had been used routinely: initially the two-hand ports were on the contralateral side of the hernial side but recently the whole three ports had been on the vertical midline from pubic symphysis to umbilicus.

The polypropylene mesh (Ethicon) was placed in all patients. In the beginning the author found that the use of a single preformed mesh size (6×11 cm.) consumed higher cost, then recently the author has divided the bigger mesh into many smaller sizes (7.5 ± 12 cm.). The author used 3-4 spiral staples (Tacker, Auto suture) in each side (size 5 mm.) for all patients. The author used the reusable hand instruments to save cost and limited the unnecessary facilities such as balloon dissector and spiral staples.

In the year 2008, the author followed up the contacted patients in the hospital in order to assess their current postoperative conditions.

Results

The laparoscopic TEP herniorrhaphy was successfully performed in 104 patients (97.2%) but 3 patients (2.8%) had to be converted to open herniorrhaphy. The first patient was due to previous lower abdominal operation from stab wound abdomen. This patient had the extensive small bowel adhesion with anterior abdominal wall and there was small bowel perforation during creating tunnel. The second patient also had adhesion without previous abdominal operation. The last patient was converted to open procedure due to a large amount of tear peritoneum and inadequate working space.

The average age was 60.1 years old (31-85). Among 107 patients there were 104 males (97.2%) and 3 females (2.8%). The average weight was 63.13 kg. (39-95).

In 107 patients there were 119 hernial defects (Table 1). There were 5 recurrent cases (4.7%) and 7 incarcerated (6.5%). The incarcerated patients meant

Table 1 Detailed diagnosis of hernial defects

	IIH	DIH	Both	Total (patient)
Unilateral	79	16	3 (pantaloon)	98 (91.6%)
Bilateral	5	3	1	9 (8.4%)
Total (defect)	**93 (78.1%)**	**26 (21.9%)**	**119**	**107**

Table 2 Underlying illness in patients

Underlying illness	Number of cases
Hypertension	14
Asthma	4
COPD	2
Gout	3
BPH	2
CVA	1
Parkinson	1

Table 3

Complications	Number of cases
Small groin hematoma	10
Scrotal hematoma/seroma	2
Minor groin pain	2
Bowel ileus	2
Scrotal subcutaneous emphysema	1
Acute urinary retention	1
Inferior epigastric vessels injury	1
Small bowel perforation	1

that there was small bowel or omentum adhesive to the end of sac in varying size. Some patients had underlying diseases (Table 2). The mean duration of symptom was 32.9 months (range 1-876 months).

Seventeen patients (15.9%) had previous herniorrhaphy. In one patient, TEP was performed on the right side at this hospital. One year later he had inguinal hernia on the other side. There were 5 patients (4.7%) who had inguinal hernia on the same side (recurrent) and 12 patients (11.2%) who had inguinal hernia on the other side.

There were 5 patients in whom abdominal operations were done before. Upper abdominal exploration was performed in 2 cases and lower abdominal surgery with vertical midline surgical scar was performed in the rest. The first case had suprapubic lithotomy for vesicle calculi. The second case had total abdominal hysterectomy and the third case had generalized exploratory laparotomy for stab wound lower abdomen.

There were 4 patients who had second principal diseases which were operated simultaneously with LH. The first three patients had concurrent symptomatic gall stones in which laparoscopic cholecystectomy was performed in the same session. The last patient with bilateral IIH had large prolapsed internal hemorrhoids and hemorrhoidectomy was performed at the same time. The mean operative time was 72.74 minutes (range 40-160 minutes). During operation, there were 10 patients with tear peritoneum which impacted to take longer operation time.

The LOS of this group was 2.85 days (range 1-8 days). The 9 bilateral cases were repaired both sides and there were another 4 patients grafted bilaterally as well. The author inserted round Jackson-Pratt drain in 25 patients. Most of mesh graft were fixed by 3 spiral staples each side. Some patients needed more staples because of the bigger defects. The complication took placed in 20 patients (18.7%) which most of them were minor conditions (Table 3).

The average follow-up time of the whole group was 38.8 months (range 1-106 months). There was only one recurrence (0.9%) at one year later. Until the end of year 2008, 5 patients died from other conditions. Seven patients were lost to follow-up.

Discussion

In this study, 3 patients (2.8%) were converted to open herniorrhaphy whereas many reviews had reported an incidence of 1.3-2.2%[7,9] because of the following reasons; the first patient had the previous lower abdominal operation so the small bowel was perforated during making tunnel; the second patient also had plenty of adhesion without previous lower abdominal operation; the third patient had large peritoneal tear. In addition, this study also showed 3 patients had previous lower abdominal surgery but fortunately two of them who had the vertical midline surgical scar (TAH and suprapubic lithotomy) were successfully repaired. In the author's opinion, the previous lower abdominal surgery should be a relative contraindication for LH.[5,10]

The mean operative time in this study was 72.7 minutes while the others,[3,4,11,12] was 50-81.2 minutes. However, this operative time was too long due to 3 major reasons. Firstly bilateral grafting was done in 13 patients; 9 cases due to their bilateral hernia and 4 cases as prophylaxis for incipient contralateral hernia occurred in up to 11.2% as reported in previous papers.[13,14] Interestingly, this study had the same percentage of 11.2% and further study on the influenced factors should be conducted. The second reason was due to incarcerated indirect hernia in 7

patients. TEP was performed by taking down the whole sac without opening and with opening sac to dissect content (small bowel and omentum) from the internal adhesion. Unfortunately, 2 patients had postoperative bowel ileus. The third reason was 10 patients had teared peritoneum caused high pressure pneumo-peritoneum that interfered the working space. Consequently, dissection of peritoneum in TEP approach was very important in terms of quantity and quality and it also influenced both recurrences and complications.

This study had one recurrence (0.9%) one year later. Most of the published papers showed the recurrences between 1.6-4.3%.[6,9,11,13,16,17] Mostly the percentage over 3 was in the learning curve.[6,17] The accepted recurrence of hernia repair in the experienced hand should be around 2%.[15] The only one patient who recurred was 80 years old with a very large indirect hernia and long-lasting history. His internal ring was so large. Furthermore, there was inferior epigastric vessel injury and postoperative subcutaneous emphysema causing inadequate dissection. Hematoma, subcutaneous emphysema and inadequate dissection could disturb the proper placement of mesh. The influencing factors for recurrence were 1) surgeon inexpertise; 2) inadequate dissection; 3) insufficient prosthesis size; 4) insufficient prosthesis overlap of hernial defect; 5) prosthesis folding and twisting; 6) mesh lifting from hematoma/ seroma; and 7) missed hernia.[15]

Twenty patients (18.7%) had complications and most of them were minor conditions. Only 2 patients (1.8%) suffered from severe complications such as inferior epigastric vessels injury and small bowel perforation which were leading to recurrence and conversion to open repair respectively. Most literatures reported wide range of complication rate from 3.7% to 21.3%.[2,5,13,16] Unfortunately some reports showed incidence of chronic groin pain up to 34-54%[18,19] but this study found only 2 patients who had full recovery after 3 months. The most common complication was small groin hematoma[2,16] which this study found in 10 patients and totally disappeared within 2-3 weeks after operation. Some literatures reported other serious complications such as infertile, pneumothorax,[3,20] severe groin pain,[19] orchitis,[2] and bladder perforation.[3]

Most of patients were satisfied with LH especially during early postoperative period. This study did not collect data of how soon and how well they could be back to routine works and activities. The prospective study should be further conducted to assess patient satisfaction and activity or occupational limitation after laparoscopic repair.

Conclusion

The TEP approach was efficient, safe and comparable to other laparoscopic hernioplasty or open tension-free repair due to an acceptable low recurrent rate without mortality. However, the outcome of this repair depended on how to select patients, the expertise of surgeon and the modification of technique.

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