ORIGINAL ARTICLE

OUTCOME OF LAPAROSCOPIC TOTALLY EXTRAPERITONEAL HERNIOPLASTY FOR INGUINAL HERNIA

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Background: Hernioplasty for Inguinal hernia is one of the commonest operations performed in general surgical wards. More recently, interest has waxed and waned regarding the minimally invasive approach to hernioplasty. This study was carried out to assess the management outcome of minimally invasive hernioplasty (Totally extra-peritoneal approach) as the treatment of choice for uncomplicated (incomplete and reducible) inguinal hernia. **Methods:** In this quasi experimental study patients aged between 14–83 years who were otherwise fit and willing for total extra-peritoneal laparoscopic repair were recruited prospectively over a 10 month period. Thirty-seven such patients were operated and followed up in the hernia clinics. Six cases were later excluded for lack of proper follow-up. **Results:** The typical patient was middle-aged male with right-sided inguinal hernia. Mean operating time was 53.3 minutes. No conversion was undertaken; however, there was one case of small bowel injury that went unrecognized on-table but necessitated subsequent laparotomy. Overall morbidity was 13.5%. Mean length of hospitalization was 2.89 days. Mean duration to normal routine life was 9.25 days. Overall, 70.9% of patients expressed satisfaction with the surgery. **Conclusion:** Totally extra-peritoneal mesh repair is a new and safe technique for hernioplasty with acceptable rates of morbidity and it is procedure of choice for recurrent and bilateral inguinal hernias and also used as alternate to open hernioplasty for uncomplicated (incomplete and reducible) inguinal hernia.

Keywords: Hernioplasty, minimally invasive, laparoscopic, totally extraperitoneal approach

J Ayub Med Coll Abbottabad 27(3):613–6

INTRODUCTION

Inguinal hernia is the most common external abdominal hernia, accounting for over 90% of cases.[1] It exhibits a marked male predominance M:F=20:1.2 Inguinal hernia is of two types, indirect and direct.2,3 The sac of an indirect sac arises from patent processus vaginalis. The hernia travels down the inguinal canal from the internal ring and exits as a subcutaneous lump exhibiting a cough impulse at the external inguinal ring above and medial to the pubic tubercle. The direct hernia results from a weakness of the posterior wall of the inguinal canal medial to the internal ring and hence the inferior epigastric vessels; the sac is thus in close proximity to the external ring.[1,2]

Indirect inguinal hernias are twice more common on the right than on the left. In indirect inguinal hernias this is attributed to a delay in the atrophy of the processus vaginalis that follows the normally slower descent to the scrotum of the right testis.1 It can be classified based on clinical presentation into five types which are: Reducible, irreducible, obstructed, strangulated, and inflamed.[3,4]

Various surgical methods are available, which include both open and laparoscopic surgery.[5] Repair procedures for inguinal hernia fall into two categories: Fascial repairs and tension-free prosthetic (polypropylene or polyester) repairs. Fascial repairs are the oldest and include: Bassini, Bassini with Tanner's slide, McVay, Ferguson, and Shouldice. Their only advantage is the avoidance of the prosthetic material, which may become infected, but they carry the highest incidence of recurrence particularly the Bassini operation.[1–3,6–8] Tension-free prosthetic (polypropylene or polyester) repairs may be performed by the anterior open approach or by laparoscopic method. The laparoscopic approach has a number of advantages that include less postoperative pain, earlier return to full activity and work, and reduced incidence of persistent groin pain. It is also the best procedure for bilateral and recurrent hernias.[2,3,9,10] There are two methods for laparoscopic surgery, i.e., total extra-peritoneal (TEP); and trans-abdominal and pre-peritoneal (TAPP).[11–13] TAPP is associated with high rate of port site hernia and visceral injury.[14] On average TEP is estimated to be less costly and more effective.[15,16] This study was designed to assess the management outcome of laparoscopic total extra-peritoneal hernioplasty approach as the treatment of choice for uncomplicated (incomplete and reducible) inguinal hernia.

MATERIAL AND METHODS

This was a quasi-experimental study conducted at Surgical Ward-2, Jinnah Postgraduate Medical Centre (JPGMC) Karachi for a period of 10 months. During this period 37 patients were operated and discharged after laparoscopic hernioplasty. Six patients were

excluded due to lack of sufficient data and/or follow-up visits. All patients ranged between 14–85 years of age with clinical diagnosis of incomplete, reducible inguinal hernia, had given written and informed consent; and found fit for general anaesthesia were included in the study. Those patients were excluded in which conversion undertaken for instrumental failure or those lost to follow-up within one month of surgery

Information was collected through a structured *pro forma*. At least two follow ups were taken after one week and one month of operation respectively. A thorough history and clinical examination was undertaken at each follow-up for possible complications. Patients were directly questioned for normalization of activities and preference, or otherwise, of the minimally invasive approach at the one month visit. Additional follow-up visits were only advised in case of morbidity. Statistical analysis was carried out on SPSS-14.

RESULTS

All patients were males aged 14–83 years (mean age was 37.4±years). Only 11 of the 37 patients were educated up to college-level or above. Of these, 31 patients had unilateral hernia (19 right and 12 left) and 6 patients had bilateral hernia with indirect as the most common. Four (10.8%) patients had comorbidities: 2 (5.4%) had hypertension, one had diabetes mellitus and another had chronic obstructive pulmonary disease (COPD). The patient with COPD was graded as ASA-III, the other three with hypertension and DM being classed as ASA-II. All other patients, except the above four, belonged to ASA-I on preoperative assessment.

Four patients had associated findings preoperatively which necessitated surgical intervention. Two patients had lipomas that were excised. Another two had right indirect sacs associated with cryptorchidism (small; atrophic testis in the inguinal canal). Orchidectomy was done in both cases, which were in their late twenties.

The commonest variety encountered on table was right indirect inguinal hernia (13 out of 37 cases, 35%). The table-1 summarizes the frequency of various hernia types. No pantaloon or sliding hernias were encountered. As already stated, only reducible, incomplete hernia sacs-were selected for the present research.

The operating time ranged between 15–120 minutes. (Mean=53.3 minutes). The mean improved from 71 minutes (range 30–120 minutes) in the first 10 surgeries to 42.5 minutes (range 20–60 minutes).

Overall morbidity was 5 (13.5%). All except one were recognized before discharge. Table-2 summarizes the list of complications. The most sinister morbidity occurred in a 50 years old male, who underwent bilateral direct hernioplasty accidental pneumo-peritoneum happened on table. The patient developed tachycardia and abdominal fullness on first postoperative day. He was re-operated on the said day, a small rent 1×0.5 cm was discovered approximately 5" from the ileocecal valve. Resection anastomosis, followed by copious lavage and drainage was undertaken. Prolene mesh was removed. Postoperative recovery was uneventful and sent home on the 8th postoperative day. All other complications responded to conservative means. There was no mortality. Of the total 37 patients, six did not show up after the 1st and 2nd week of follow-up. They were excluded during analysis of parameters that required at least a one month follow-up (i.e., resumption to normal physical activity, overall satisfaction with the surgery, preference in case of recurrence and analgesia requirements).

The mean length of hospitalization was 2.89 days (range 1–8 days). Only seven patients stayed for longer than three days. Only 31 patients were included in the analysis of this variable as six did not show up regularly for follow-up. The mean duration for normalization physical activity was 9.25 days (range 2–26 days). Majority (58%, 18 out of 31 patients) reported return to normal physical routine within a week. After one month 31 patients interviewed postoperatively, 22 expressed an overall satisfaction with the surgery. One patient expressed his willingness to choose laparoscopic surgery again. Opioid analgesia was administered electively for the first 24 hours. Beyond that time, oral Paracetamol was prescribed on as required basis and parenteral analgesia (intramuscular diclofenac as 2 lines, intravenous nalbuphine as 3 lines) was reserved for pain not responding to oral therapy. Overall, 19 patients (61.2%) felt the need to use analgesia at home. Of these, only two had pain severe enough to warrant intramuscular diclofenac, while none required opioids. No patients required analgesic support beyond day 10.

Table-1: Different types of hernia (n=37)

Type of hernia	Number (%)			
	Right	Left	Bilateral	Percentage
Direct hernia	4 (10.8)	3 (8.1)	6 (16.2)	35
Indirect hernia	13 (55)	8 (21.6)	0 (0)	56.7
Recurrent hernia	2 (5.4)	1 (2.7)	0 (0)	8.1
Total	19 (51.3)	12 (32.4)	6 (16.2)	100

Table-2: Frequencies of complications (n=37)

Complication	Patients	Percentage
Accidental pneumoperitoneum	3	8.1
Small bowl injury	1	2.7
Atelectasis	1	2.7
Testicular swelling (late)	1	2.7

DISCUSSION

In the early 1990's laparoscopic hernioplasty gained popularity worldwide.[22] Laparoscopic hernia repair is treatment of choice for uncomplicated inguinal hernia. There are two methods, i.e., TEP, TAPP.[18] In this study TEP is adopted against TAPP. TEP hernioplasty may be performed by two methods, i.e., standard TEP and single port Laparoscopic TEP Hernia repair. We adopted standard TEP laparoscopic technique.[19] TEP is estimated less costly and more effective.[10,20,21] No randomized controlled trial has as yet shown a superiority of one over the other.[2,14] TAPP is associated with high rate of port site hernia, visceral injury and peritoneal contamination.[14,22] In this study TEP has been used.

Potential space was created with 10mm trocar instead of balloon-contraption or Hagar dilators. We find that this step is quicker and provides a heavy advantage of "doing it under vision". Also, it creates a more expansive space than with other means**.**

Total patients included in this study were 37 as compared to 263 patients in Dulucq JL *et al*.[23] The average age in our study was middle aged male The commonest hernia type encountered in our series was right indirect inguinal variety. Kim et al study showed that right inguinal hernia was also common 26 out of 63 cases.[17]

Time-span is an important factor when laparoscopic TEP Technique has to be put forth, for wide acceptance, especially in comparison to the already existing values.[23] Although we did not compare laparoscopic to open hernioplasty; however, international literature mostly found no statistically significant difference between the two or less time span in open hernioplasty.[8,12,24–26] The mean operative time in our series was 53.3 minutes, quite close to that found by the German study.[15] This goes on to show that like other laparoscopic procedures, the learning curve goes a long way in reducing the operating time.

Average hospital stay in our study was 2.89 days. A decent figure compared to other studies that range from 1.5 to 6 days.[20,24,27] Still, to thoroughly support minimally invasive surgery, hospital stay should come down to less than 48 hours, a factor that is severely affected by cultural beliefs and individual patients psyche.

Our patients were belonging to the working class where early return to work is very important because most of the time he is the only person for the family support. The average time for normalization of activities was 9.25 days, slightly higher than one would expect from a minimally invasive surgery. Although the figure is not too digressing compared to published data,[4,27] in fact even lower compared to some, we feel that psychosocial clichés prevalent in our set up play a major role in outcome of this type.

Rate of conversion is another major factor undermining the adoption of minimally invasive surgery. International research has wide-ranging conversion rate from 0.16% to 4%.[4,5,9,13,14,16,28] In Dulucq JL *et al* two patients were converted to TAPP repair due to surgical difficulties.[23] In our small series, no conversion took place.

The complication rate in our study was 13.5%, including accidental pneumo-peritoneum (n=3) small rent in ileum (0.5×1 cm). International studies show it as 16%.[24] Although we did not analyse morbidity vis-à-vis the learning curve, published studies have shown an improvement in rates of complication with increasing experience.[5,24] We did not encounter any neurogenic pain in the postoperative period, and something in contrast to most other studies.[1,10,22] We attribute this to an obsessive preservation of nerves and planes, an obvious theoretical advantage of laparoscopic repair.

All patients in our study expressed an overall satisfaction from the surgery at 12-month follow-up which is the same as in a study conducted in 2003 by Lal P *et al*.[25] Patient satisfied from surgery because of less hospital stay, no conversion rate, less cost, early return to work and no scar or minimal scar.

After follow for period 12 months no recurrence was seen. It was the same in study conducted in 2003 by Lal P *et al*. there was one recurrence seen in study carried by Subwongcharoens.[24] In other studies no difference in subsequent recurrence rate between TEP and open repair.[26,28]

Despite the fact TEP was a new procedure for surgeons and study was conducted during the learning phase, the results are comparable with those in world literature.

CONCLUSION

Totally extra-peritoneal mesh repair is a new and safe technique for hernioplasty with acceptable rates of morbidity and it is procedure of choice for recurrent and bilateral inguinal hernias and also used as alternate to open hernioplasty for uncomplicated (incomplete and reducible) inguinal hernia.

AUTHOR'S CONTRIBUTION

HH: Performed study for partial fulfilment of requirement of FCPS (Surgery) examination. SAM: Helped in collection of data, review of literature and also writes the final manuscript of article.

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