

ORIGINAL ARTICLE

A comparative study of laparoscopic inguinal hernia repair and Stoppa repair in cases of bilateral inguinal hernia

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ABSTRACT

BACKGROUND AND OBJECTIVES: The aim of the current prospective comparative study is to evaluate the outcome of laparoscopic repair of bilateral inguinal hernia in comparison to the open Stoppa method. **METHODS:** 50 cases of bilateral primary inguinal hernia were subjected to Stoppa repair and laparoscopic hernia repair randomly and as per surgeons' choice. Evaluation of all the patients included in the study was done regarding the history, physical findings, operative details and post-operative complications. The patients were followed up at one month and six months intervals for any complications, chronic groin pain or recurrence. **RESULTS:** All patients presented with a swelling in the growing from 2 months to 10 years after appearance of the swelling. Highest number of patients were in the age group of 51-60 years. During post-operative stay, 2 patients had seroma and 2 patients had wound infection in Stoppa repair, while in laparoscopic repair 4 patients had port site infection. Statistics show significantly shorter duration of surgery, time till mobilisation and time till oral intake in laparoscopic group, while hospital stay, post-operative complications and recurrence rates were not found to be significantly different in both groups. **CONCLUSION:** Laparoscopic repair for bilateral inguinal hernia is a safer and better alternative to the Stoppa technique with superior immediate postoperative outcome and higher patients' satisfaction rate.

Keywords: Laparoscopic; Stoppa Technique; Bilateral Inguinal Hernia

INTRODUCTION

The repair of inguinal hernias is achieved by reinforcing abdominal wall in inguinal region using prosthetic mesh with tension-free technique. This can be achieved by using either open or laparoscopic method. Laparoscopic treatment of inguinal hernia was first described by Schultz et al. in 1990.¹ Since then the laparoscopic approach has been utilised widely across the world. Compared with the conventional techniques, the laparoscopic approach has shown better results in terms of reduced postoperative complications and better quality of life.^{2, 3, 4}

The gold standard for the repair of inguinal hernias is the Lichtenstein repair (anterior approach). There are many pre-peritoneal approaches described in the literature; for example, open procedures such as Nyhus and Stoppa and laparoscopic techniques such as trans-abdominal pre-peritoneal patch (TAPP) and totally extra-peritoneal patch (TEP)(5). The aim of the current prospective comparative study is to evaluate the outcome of laparoscopic repair of bilateral inguinal hernia in comparison to the open Stoppa method.

MATERIALS AND METHODS

This clinical study was conducted from the patients admitted with the diagnosis of bilateral inguinal hernia in New Civil Hospital, Surat. The diagnosis of primary uncomplicated inguinal hernia after clinical examination of the abdomen was made on basis of history of a reducible groin swelling.

Basic investigations were done to obtain fitness for surgery. This included random

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blood sugar, blood urea, serum creatinine, ECG, hemoglobin level and chest radiograph

These patients after investigations placed in two groups according to the surgeons' choice after discussing with patient. One for laparoscopic hernia repair and another for STOPPA repair.

50 patients of hernia were included in the study based on the inclusion and exclusion criteria as mentioned below:

Inclusion criteria:

Men 18 years of age or older with bilateral primary uncomplicated inguinal hernia.

Exclusion criteria:

Pediatric age group.

Patients with complicated inguinal hernias (irreducible, incarcerated or strangulated) are excluded from the study.

Recurrent hernia

patient with systemic disease

All surgeries were conducted under general anesthesia with a broad spectrum 3rd generation cephalosporin given intravenously prior to induction and another dose given on the same day postoperatively.

Surgical technique of TEP:

A short sub-umbilical incision (2cm) was made and deepened to expose the anterior rectus sheath. A short longitudinal incision was made in the anterior rectus sheath to expose the underlying rectus muscle which was retracted laterally to expose the posterior rectus sheath. The plane between the rectus muscle and the posterior rectus sheath led inferiorly to the extra-peritoneal space with a blunt tipped trocar or a dissecting balloon. A balloon dissector was inserted through the opening in the midline up to pubic symphysis superior to posterior rectus sheath and extra peritoneal space was created with balloon inflation and kept for 5 minutes for hemostasis. 10mm port then inserted and secured with thread and further used as a camera port. Another 5mm port was made 1 finger above the pubic symphysis in the midline. Third 5mm port was inserted in middle of two above mentioned ports in midline. Dissection of retro pubic space of retzius

in medial inguinal fossa and lateral inguinal fossa were done using blunt and sharp dissection. All potential sites of hernias were inspected i.e., direct, indirect, obturator & femoral. Hernia sac was reduced .Adequate parietalisation was done. 15 × 15 cm polypropylene mesh was inserted, unrolled over myopectineal orifices as per standard guidelines. Mesh was rolled outside and delivered inside via camera port. After right alignment of mesh inside, it was unrolled on the floor. Mesh was fixed at 3 points: - 1. At pectineal ligament. 2. About 1 cm above pubic symphysis in anterior abdominal wall. 3. Laterally 1 cm above the anterior superior iliac spine Tackers (5 mm) were used as fixing device.

Surgical technique of TAPP:

Patients were placed in supine Trendelenburg position. TAPP was performed through three ports : one 10-mm port optical guided in the upper umbilical crease and two 5-mm ports situated at the level of the umbilicus outside linea simularis on both sides. The peritoneum was incised starting at the medial umbilical fold and proceeding laterally to the anterior superior iliac spine. The incision was made well away from the internal ring to provide ample tissue to cover the peritoneal defect at the end of the procedure. The peritoneum was peeled down and bluntly dissected from the underlying structures. The hernia sac was gently pulled out and completely dissected free from the cord structures, Two separate 12×15-cm. polypropylene meshes one on each side were horizontally implanted and fixed into Cooper's ligament, the rectus muscle, and the transversalis fascia with 6-10 tacks along the medial and cranial border of the mesh (avoiding the triangle of doom and the triangle of pain),. The peritoneum was closed over the mesh with a running vicryl (Ethicon) 2/0 stitch, No drains were used.

Technique of open preperitoneal approach (Stoppa technique):

30x30 cm polypropylene mesh was fashioned and implanted via midline

incision into widely dissected preperitoneal space. The hernia sac was divided in some cases and reduced in some other cases and the peritoneum was closed. The vas deferens and the testicular vessels were dissected from the parietal peritoneum. When freed and lateralized, so as to lie against the parietal wall of the pelvis. However in some cases it was necessary to slit the mesh for the cord. The mesh was put to cover the entire myopectineal orifice. The mesh was fixed with a single suture to the umbilical fascia as it is held in place by intra-abdominal pressure. Closure in layers was done.

Intra operative findings like contents of the sac, duration of surgery and any technical difficulty encountered during the surgery were noted.

The patients were assessed for the severity of post-operative pain using visual analogue scale at post-operative day 1, day 7, day 15, 1month and 6th month of operation. Visual analogue scale consists of a 10cm line anchored at one end by a label as no pain and at the other end by a label such as severest pain patient has experienced in his lifetime. We translated this for documentation as 1-3 cms minimal pain, 4-7 cms moderate pain and 8-10 cms severe pain.

These patients were also followed up for post-operative complications like wound infection, wound seroma, wound hematoma and wound dehiscence.

Sutures were removed on the 10th postoperative day. Most patients were ambulatory by 2nd post-operative day and requested to go home and return to get their sutures removed on 10th post-operative day. Patients were discharged early if there was no wound infection, were ambulatory, were taking orally and felt comfortable.

Patients were later called to the outpatient department and follow-up was done after 1 week, 4 weeks and 6 months for complications like chronic groin pain, time taken to return to normal activity, patient's satisfaction and recurrence.

All patients were encouraged to return to work as soon as possible and on subsequent follow-ups each patient was specifically asked whether he was satisfied with the quality of life he was leading after the surgery. The physical function, and limitations caused by the surgery were assessed.

OBSERVATIONS

This study includes prospective comparative study of laparoscopic inguinal hernia repair and Stoppa repair in 50 cases of bilateral inguinal hernia repair. In this study, Patients range in the age from 21 to 70 years, 25 cases of Stoppa repair and 25 cases of laparoscopic repair. Majority of patients were in age group of 51-60 in both groups.

Table 1: Age Wise Distribution of Cases

Age (years)	STOPPA repair		Laparoscopic repair	
	No. of cases	Percentage (%)	No. of cases	Percentage (%)
21-30	3	12%	2	8%
31-40	6	24%	5	20%
41-50	3	12%	6	24%
51-60	8	32%	6	24%
>60	5	20%	6	24%
Total	25	100%	25	100%

(Table-1) Most of the patients in both groups had swelling for last 1 to 5 years, 40% in Stoppa group and 68% in laparoscopic group. 28% patients in Stoppa group and 36% in laparoscopy group had pain for less than 1 month prior to surgery.

Table 2: Duration Surgery (Min)

Duration of surgery (min)	STOPPA repair		Laparoscopic repair	
	No. of cases	Percentage (%)	No. of cases	Percentage (%)
70	0	0	5	20
80	5	20	14	56
90	12	48	6	24
100	5	20	0	0
110	3	12	0	0
Mean+/-SD	92.4/9.25	100	80.4/7.73	100

(Table-2) Duration of surgery in case of stoppa repair ranges from 80 to 110 minutes with mean of 92.4 minutes while in laparoscopic repair it ranges from 70 to 90 minutes with mean of 80.4 minutes.

Table 3: Time till Mobilization

Time till mobilization (hours)	STOPPA repair	Laparoscopic repair
6-8	17	22
8-12	8	3

(Table-3)17 patients in stoppa group were mobilised within 6 to 8 hours post-operatively while in laparoscopic group 22 patients were able to mobilise. Mean time for starting oral intake post-operatively is 16.4 hours in stoppa repair while in laparoscopic group it was much lower that is 7.52 hours.

Table 4: Early Post-Operative Pain-Stoppa repair

Early Pain(VAS Score)	24h	7 th day	15 th day
No(0)	0(0)	6(24)	9(36)
Minimal(1-3)	16(64)	15(60)	13(52)
Moderate(4-6)	9(36)	4(16)	3(12)
Severe(7-10)	0(0)	0(0)	0(0)
Total	25(100)	25(100)	25(100)

Table 5 : Early Post-Operative pain – Laparoscopic Repair

Early Pain(VAS Score)	24h	7 th day	15 th h
No(0)	0(0)	11(44)	13(52)
Minimal(1-3)	16(64)	12(48)	11(44)
Moderate(4-6)	9(36)	2(8)	1(4)
Severe(7-10)	0(0)	0(0)	0(0)
Total	25(100)	25(100)	25(100)

(Table-4 & 5)Moderate pain was present in 9 cases (36%) during the first 24 hours in each group. At the end of 7 days, in laparoscopic group, 12 (48%) patients had minimal pain and 11 (44%) patients experienced no pain, while in stoppa group, 15(60%) had minimal pain and 4(16%) had moderate pain. Majority of patients had minimal or no pain at 15th day in laparoscopic group. During post-operative stay, 2 patients had seroma and 2 patients had wound infection in Stoppa repair, while in laparoscopic repair 4 patients had port site infection. Among all cases studied, 2 patients in stoppa group reported with recurrence at the end of 6 months.

DISCUSSION

A revolution in inguinal hernia repair surgery has occurred during the last two decades by application of laparoscopic surgery to the treatment of inguinal hernia in the early 1990s.Wauschkuhn et al.,(6) compared the results of laparoscopic bilateral with laparoscopic unilateral hernia repair and reported that simultaneous laparoscopic repair of bilateral inguinal hernias does not increase the risk for the patient compared with

unilateral repair and considering recovery after laparoscopic repair is faster than after open simultaneous repair. They recommended laparoscopic inguinal hernia repair of bilateral hernias as the gold standard approach.

In the current study we evaluated the outcome of laparoscopic repair of bilateral inguinal hernia in comparison to the Stoppa technique.

In our study, mean operative time for open Stoppa was found to be 92.4±9.25; range: 80-110 minutes, no patients required wound drainage, mean time till first mobilization was 8.44±1.17 hours, mean time till oral intake was 16.4±3.31 hours and mean hospital stay was 2.24±0.43 days. During the surgery technical difficulty was encountered in 15 patients (60%) of Stoppa repair and 5 patients (20%) of laparoscopic repair. Only 4 patients developed minor postoperative complications in form of hernia site seroma and wound infection and 2 recurrences was reported after a follow-up period of 6months. These figures coincided with that reported in literature; Fernández-Lobato et al., (7) reported that Stoppa procedure is a very safe repair of bilateral inguinal hernia, with operative time around 100 min; hospital stay decreased ranged from 1.2 to 5.1 and morbidity in range of 12-16% and recurrence rate in range of 0.5-6.6%. On the contrary, laparoscopic repair provided superior intra- and postoperative outcome manifested as statistically significantly shorter operative duration(80.4±7.73) significantly shorter time till first mobilization (7.36±1.25) and significantly shorter time till resumption of oral intake (7.51±1.32).Duration of hospital stay (2.08±0.27) was also found to be relatively shorter but statistically not significant. Laparoscopic repair is associated with statistically non-significant fewer immediate postoperative complications but also resulted in no recurrence after a mean follow-up period of 6 months. These findings go in hand with Bencini et al.,(8) who evaluated the outcome of

laparoscopic properitoneal hernial repair for bilateral inguinal hernia and reported no conversions, mean operative time of 88 minutes (including bilateral cases), no major intraoperative accidents, and only 12 minor postoperative complications (4 urinary retention, 6 seromas, and 2 cases of prolonged pain) with a mean hospital stay of 1.7 days.

Pironi et al., (9) compared the results of open mesh technique and laparoscopic TAPP repair for inguinal hernia and found the median operative time was 71 minutes for open group and 92 min for laparoscopic group, no intraoperative complications and with postoperative complication rate 4.5% in patients open group and 3% in laparoscopic group, This could be attributed to proper patients' selection, allowing completion of all cases within reasonable duration of surgery without intraoperative complications and no conversion rate. A significant difference was observed in the median time to return to normal activities. They concluded that the safety and effectiveness of laparoscopic approach to inguinal hernia repair is an excellent alternative to conventional surgery with confirmed reduction of operative time, complications and recurrences.

Also, Agresta et al.,(10) studied ten consecutive young patients underwent laparoscopic repair of bilateral inguino-scrotal hernias and reported no conversions to open repair, no mortality/morbidity or relapsing hernias and all procedures were performed on a day surgery basis. They concluded that analysis of the short-term post-operative outcome indicated that, in the proper setting, TAPP can be performed for inguino-scrotal hernia repair with efficiency comparable to that of normal inguinal hernia repair.

CONCLUSION

Patients who underwent laparoscopic repair showed significantly lower pain scores that could be attributed to the fact that laparoscopic surgery is minimal invasive with minimal dissection and small

sized port site wounds. These factors in addition to limited post-operative analgesia with its inherent sedative and nauseating effects allowed early ambulation and resumption to oral intake with subsequent shorter hospital stay. All these factors in addition to the cosmetically acceptable wound could explain the significantly higher satisfaction of patients in laparoscopic repair.

It could be concluded that laparoscopic repair for bilateral inguinal hernia is a safer and better alternative to the Stoppa technique with superior immediate postoperative outcome and higher patients' satisfaction rate.

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