



Efficacy and Outcome of Laparoscopic Inguinal Hernia Repair- A Prospective Study

Authors

Dr Shashikant Verma¹, Dr Ashutosh Silodia^{2*}, Dr Mayuresh Hinduja³,
Dr Mahendra Singh Gond⁴

^{1,3}Senior Resident, Department of General Surgery, NSCBMCH Jabalpur

²Associate Professor, Department of General Surgery, NSCBMCH Jabalpur

⁴Professor, Department of Surgery, GMC Chhindwada

*Corresponding Author

Dr Ashutosh Silodia

Associate Professor, Department of General Surgery, NSCBMCH Jabalpur, India

Abstract

Introduction: The popularity of laparoscopic inguinal hernia repair is increasing due to less tissue dissection leading to less postoperative pain and a shorter duration of convalescence compared with an open hernia repair technique. There are two laparoscopic surgeries available for a groin hernia, Trans-abdominal pre-peritoneal (TAPP) and totally extra-peritoneal (TEP) hernia repair.

Aim of this study was to find out the efficacy and outcome of laparoscopic inguinal hernia repair.

Method: Laparoscopic inguinal hernia repair was done in 20 patients using either TAPP or TEP technique.

Observation: 10 cases (50 %) underwent TAPP repair and 10 cases (50%) TEP, of which 3 cases of TAPP and 2 cases of TEP was converted to open repair (25% cases) due to intraoperative complication. Mean operative time was 138 minutes for TAPP and 180 minutes for TEP. Mean postoperative hospital stay was 3.71 days for TAPP and 3 days for TEP. Number of doses of analgesia required postoperatively for first 3 days was 7.71 doses in TAPP group and 7 doses in TEP group. There was no recurrence in follow up period.

Conclusion: Laparoscopic hernia repair is a good technique but has a longer learning curve but good postoperative recovery manifested as less pain, earlier mobilization and early return to his daily routine activity. The technique was efficacious as there was no recurrence in our study. There was significant decrease in pain score in both TAPP and TEP group, VAS scoring was >80% from 1st to 3rd post operated day.

Keywords: TAPP- Trans-abdominal pre-peritoneal repair, TEP- totally extra-peritoneal hernia repair, VAS scoring- Visual Analogue Scoring.

Introduction

Hernia is a common problem of the modern world with an incidence ranging from 5%-7%. Of all groin hernias, around 75% are inguinal hernias.^{16,}

⁷¹. The popularity of laparoscopic inguinal hernia repair is, increasing due to less tissue dissection leading to less postoperative pain and a shorter duration of convalescence compared with an open

hernia repair technique.^[1,2] Other advantages of laparoscopic hernia repair^[8] are- small incision, Shorter hospital stay, Bilateral repair could be done through same incision, Good cosmesis, Covers whole myopectineal orifice, Cord structures remain untouched. Laparoscopic hernia repair also has disadvantages which include - Long duration of surgery, higher risk of serious complications, difficult learning curve. Complications of laparoscopic hernia repair are same as of open repair^[9] with the additional risk of vascular and visceral injury.^[10-13] There are two minimally invasive surgery available for a groin hernia repair, Trans-abdominal pre-peritoneal repair (TAPP) and totally extra-peritoneal hernia repair (TEP). While the mesh is placed in both of them, the approach through the abdominal cavity (TAPP) or in front of the peritoneum (TEP) is different. Comparing the two techniques, TEP is associated with a slightly faster postoperative recovery; the TAPP technique has a significantly higher incidence of operative morbidity. For incidence of recurrence, long-term neuralgia, duration of surgery, and length of hospital stay, both approaches seem to be similar.^[3] Laparoscopic hernia repair is best suited for recurrent and bilateral inguinal hernia although it may be offered for primary inguinal hernia.^[5]

Method

Prospective study of Efficacy and outcome of Laparoscopic inguinal hernia repair was done in Netaji Subhas Chandra Bose Medical College Jabalpur over March 2015 to September 2016. Since this study was new in our institute and surgeons are in learning curve so we include only 20 patients for this study. Inclusion criteria of our study was- Direct/indirect inguinal hernia, Unilateral / bilateral inguinal hernia, Primary / recurrent inguinal hernia and Exclusion criteria was-Strangulated/ incarcerated/ obstructed hernia, Patient medically unfit for surgery, Blood coagulopathy.

Technique: TAPP and TEP, done alternatively on the patients starting first case with TAPP. All operations were done under general anesthesia.

Steps of Laparoscopic Trans abdominal Preperitoneal Inguinal Hernia Repair (TAPP)

A 10 mm Infra-umbilical port inserted to assess intra-peritoneal cavity through 30 degree telescope. Two 5mm port were inserted at mid-clavicular line on both side below the umbilicus, hernia is visualized, and the peritoneum overlying it incised sharply from the medial umbilical ligament to the anterior superior iliac spine and peritoneal flaps raised superiorly and inferiorly with blunt dissection. A direct hernia should be reduced if seen, and an indirect hernia sac dissected from the cord structures. Care is taken to avoid the "Triangle of Doom" containing the external iliac vessels. Polypropylene Mesh is introduced through the sub-umbilical trocar and positioned anterior along the pelvic wall with the center over of the primary hernia defect. Mesh is fixed using Tackers at cooper ligament and one at anterior abdominal wall. The peritoneum is re-approximated with a running suture, Ports removed and fascial defect at the umbilicus is closed.

Steps of Laparoscopic Total Extra peritoneal Inguinal Hernia Repair (TEP):

Infra-umbilical incision in the anterior fascia is made lateral to the linea-alba, and the rectus muscle retracted laterally, exposing the posterior rectus sheath. An indigenous handmade balloon dissector is used to open up the pre-peritoneal space under direct visualization. Two 5 mm trocar were inserted one at 5 cm above pubic symphysis and 2nd one between inferior port and infra-umbilical port. Dissection of extra-peritoneal space started and 2-3 cm shelf created in retro-pubic space for mesh placement. The peritoneal sac is dissected and reduced completely. Mesh introduced through the 10 mm port and fixed using tackers so that it covers all the direct, indirect and femoral hernia ports.



Figure 1-Port placement for TAPP

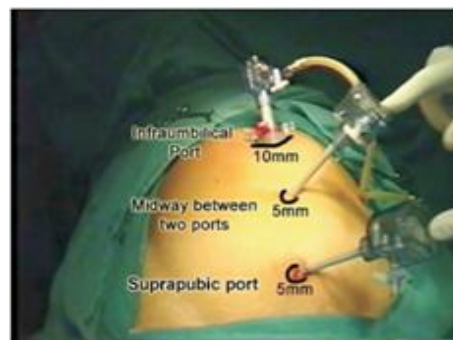


Figure 2- Port placement for TEP

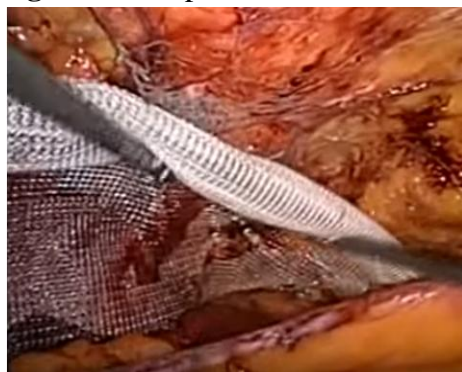


Figure 3- Mesh placement using tacker



Figure 4- After mesh placement

Post Operative Pain Assessment

Done using Visual Analogue Scoring (VAS).VAS consists of a 10 cm horizontal line with endpoints labeled “no pain” (0 mm) and “worst possible

pain” (10 cm) and is sensitive to changes in pain intensity.0 = No pain, 1-3= Mild pain, 4-6 = Moderate pain,7-10 = Severe pain.

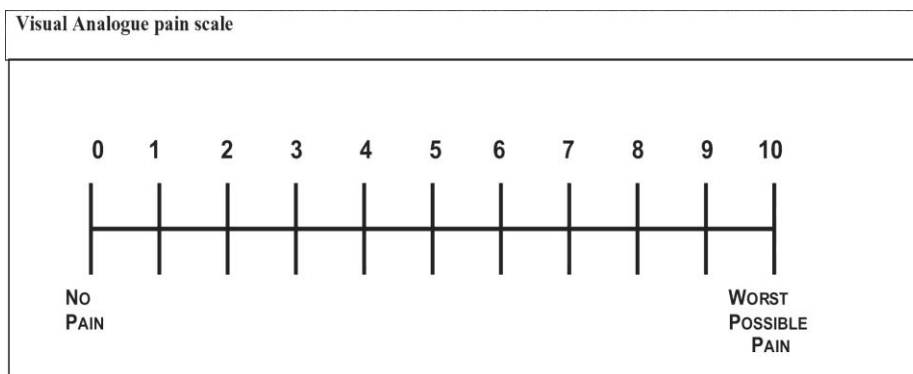


Figure – 5

Post Operative Analgesic Need

All patients were given paracetamol 500 mg TDS as long as the pain was relieved and visual analogue score was noted on 1st, 2nd and 3rd post op day. All patients were given intravenous paracetamol 500mg TDS on 1st day, then oral paracetamol 500mg BD on 2nd day and OD on 3rd day. Excess number of doses required for pain relief was noted for each patient apart from above mentioned 6 doses of paracetamol.

Observation and Result

In our study total 20 cases of laparoscopic inguinal hernia repair were studied prospectively. All cases were male having unilateral and incomplete inguinal hernia.12 cases(60 %) were having direct hernia and rest 8 cases(40 %) were having indirect hernia.10 cases(50%) underwent TAPP repair and 10 cases (50%) TEP, of which 3 cases of TAPP and 2 cases of TEP was converted to open repair due to intraoperative complication.

Table 1 Intra Operative complication

Intra-Operative Complication	Frequency	Percent
Bleeding	3	60%
Bladder Injury	0	0
Bowel Injury	0	0
Peritoneal Breech (In TEP)	2	40%
Injury To Vas/Cord Structures	0	0
Total	5	25%

Causes of conversion to open repair in 3 cases of TAPP was uncontrolled bleeding and in 2 cases of TEP was peritoneal breech.

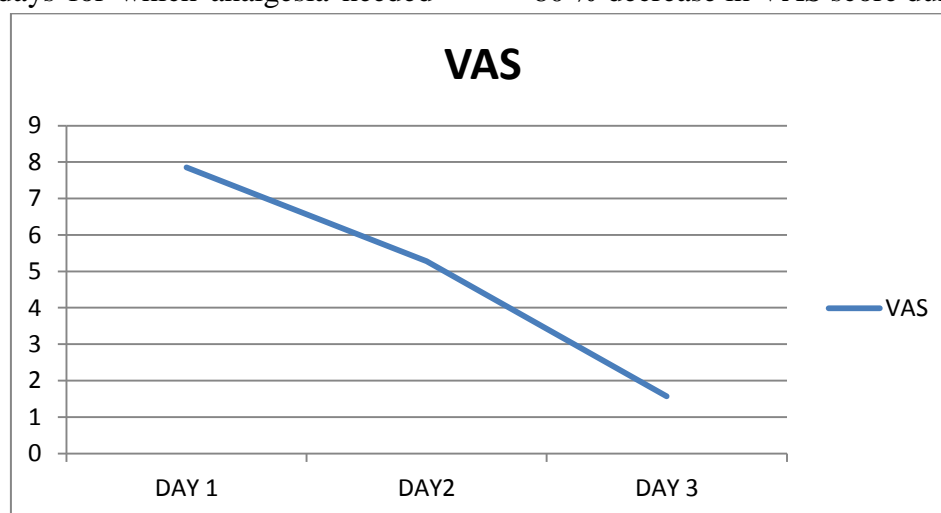
Table 2 Post Operative Complications

Post-Operative Complications	Frequency	Percent
Seroma	1	33.3%
Hematoma	0	0
Intestinal obstruction	0	0
Wound infection	1	33.3%
Mesh infection	0	0
Urinary retention	1	33.3%
Total	3	15%

Mean operative time was 138 minutes (range 110-180 minutes) for TAPP and 180 minutes for TEP. All patients were able to perform their daily routine activity on day 1 or day2, mean post-operative hospital was 3.71 days for TAPP and 3 days for TEP. Post-operatively number of doses of analgesia required for first 3 days was 7.71 doses in TAPP group and 7 doses in TEP group and number of days for which analgesia needed

was 3.42 days in TAPP group and 3days in TEP group, There was no recurrence in any patient in follow up period.

Line Diagram Showing Decrease in Vas Score During First 3 Days in TAPP Group- In TAPP group Average VAS score on day 1 was 7.85, on day 2 was 5.28 and on day 3 was 1.57. There was 80 % decrease in VAS score during these 3 days

**Figure -6**

Line Diagram Showing Decrease in Vas Score During First 3 Days in TEP Group-In TEP group Average VAS score on day 1 was 7, on day

2 was 4 and on day 3 was 1. There was 85.71 % decrease in VAS score during these 3 days.

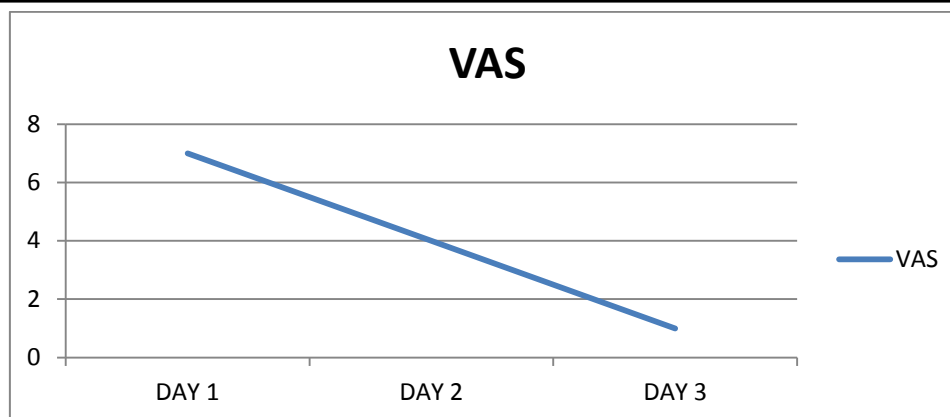


Figure -7

Discussion

In our study the mean operative time was 138 minutes (range 110-180 minutes) for TAPP and 180 minutes for TEP, while in Wang MG et al^[14] the mean operation time was (55.7±19.3) min (30-100 min) and in Hanif H et al^[15] was 53.3 minutes. In Jakhmola CK et al^[16] the mean operative time for unilateral and bilateral repairs was 40.9 ± 11.2 and 76.2 ± 15.0 minutes, respectively. In Kapiris SA et al^[17] the mean operation time was 40 minutes. Conversion to open repair was done in 5 cases (25%) in our study due to uncontrolled bleeding in the TAPP group and peritoneal breach in the TEP group. While comparing to other studies in Wang MG et al^[14] only 2 cases out of 267 were converted to open. In Hanif H et al^[15] no conversion was undertaken. While comparing with Jakhmola CK et al^[16] the conversion rate to open surgery was 0.6%. Mean operative time was more in our study and a higher percentage of conversion in our study, which could be explained by early experience of laparoscopic hernia repair at our institute. There was no case of bowel or bladder injury in our study. There were no major vascular or visceral injuries in our study. Mean Post-operative hospital stay in our study for TAPP was 3.71 days and for TEP group was 3 days, which in Wang MG et al^[14], Hanif H et al^[15], Jakhmola CK et al^[16], Kapiris SA et al^[17] was (4.9±2.7) d (2-12 d), 2.89 days, 1 day (1-5 days), 0.9 nights respectively. On comparing post op analgesia, Wang MG et al^[14], Sajid MS et al^[9], Jakhmola CK

et al^[16], McCormack K et al^[11] found significant less pain scores in laparoscopic group than open group. However the number of doses of analgesia was not studied in previous studies, which was studied in our study for first 3 days and in TAPP group was 7.71 doses and for TEP group was 7 doses of 500 mg paracetamol. There were no recurrences in our study during follow up period. In other studies like Wang MG et al^[14], Jakhmola CK et al^[16], Kapiris SA et al^[17] the rate of recurrence were 2 out of 376 cases, 1.6%, 0.16% respectively. Post-operative urine retention in our study was present in one case. Post op seroma was developed in one patient in our study. Post op port site infection was present in 1 case in our study. No case of mesh infection was observed in our study. In Wang MG et al^[14], there were cases of wound infections. In Kapiris SA et al^[17] there were 4 cases of mesh infection.

Conclusion

Based on our study Laparoscopic hernia is a good technique but has a longer learning curve but good post-operative recovery, manifested as less pain and earlier mobilization and early return to his daily routine activity due to less pain. The operating time decreases with experience. The technique was efficacious as there was no recurrence in our study. Most common intra-operative complication was bleeding and most common cause of conversion to open in TAPP was bleeding and in TEP group was peritoneal breach. There was significant decrease in pain

score in both TAPP and TEP group, in both techniques decrease in VAS scoring was >80% from 1st post operated day to 3rd post operated day. However the shortcoming of our study was small sample size and longer operating time, which could be explained by difficult learning curve of laparoscopic hernia repair.

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