

Two Port Totally Extra Peritoneal Inguinal Hernia Repair - Our Experience at a Tertiary Care Hospital

Dr. Anandaravi B N¹, Dr. Nithin M², Dr. Vidya Shree N²

¹Associate professor, Department of General Surgery, Mysore Medical College and Research Institute, India

²Post graduate, Department of General Surgery, Mysore Medical College and Research Institute, India

Abstract:

Background: A modified TEP inguinal hernia repair with two port instead of conventional three port which follows the trend of minimising invasiveness without encompassing the challenges of SILS. Single incision laparoscopic surgery (SILS) has some limitations, including the difficult ergonomics of single incision instruments, the reported increase in port-site herniation following SILS and the relatively steep learning curve. Our aim is to determine the feasibility, safety and long-term outcome of two-port TEP for laparoscopic inguinal hernia repair.

Methods: Following institutional approval, data was prospectively collected for 45 patients presenting with inguinal hernia from January 2018 to June 2019. Two-port laparoscopic TEP was offered as first-line treatment for all patients over the study duration. All patients were consented for the possibility of additional port placement and conversion to open repair. All patients who underwent laparoscopic inguinal hernia repair were included in the study. Patients demographics at the time of surgery, indications for surgery, hernia laterality and type, operative times and major intraoperative complications including bowel, bladder, vascular or nerve injury were collected.

Results: Mean age was 45.4 years. All 45 patients in the study were males. Mean operative time for unilateral repair was 48.5 min. Mean operative time for bilateral repair was 63.7 min. 3 (6.6 %) operations required the addition of a third port to reduce the hernias. 1 (2.2 %) of these cases was converted to open repair, as the hernia remained irreducible despite the addition of a third port. About 11.1 % of patients had some form of postoperative complication. Most of these complications were minor including seroma and hematoma. None of our patient experienced chronic inguinal pain. Only one patient had hernia recurrence within the follow-up time of 3months.

Conclusions: Our results were comparable to conventional three-port repair in terms of intraoperative complications, postoperative complications and hernia recurrence. Therefore, the two-port TEP appears to be a feasible, safe and effective method for inguinal hernia repair and hence should be considered as a viable, less invasive alternative to conventional three-port TEP repair.

Keywords: Totally extraperitoneal inguinal hernia repair, Laparoscopic TEP, Two-port TEP, Laparoscopic inguinal hernia repair.

Date of Submission: 10-12-2019

Date of Acceptance: 25-12-2019

I. Introduction

In recent times, there has been a movement towards the use of fewer and smaller ports in laparoscopic inguinal hernia repair. Here we have performed a modified TEP inguinal hernia repair with two port instead of conventional three port. This technique follows the trend of minimising invasiveness without encompassing the challenges of SILS. There are trials of single incision techniques for both the transabdominal preperitoneal (TAPP) and totally extraperitoneal (TEP) approaches. However, single incision laparoscopic surgery (SILS) has some limitations including the difficult ergonomics of single incision instruments, the reported increase in port-site herniation following SILS and the relatively steep learning curve. These challenges could have precluded the widespread adoption of SILS in laparoscopic inguinal hernia repair.

In this prospective study, we have used two port instead of conventional three port for totally extraperitoneal repair of inguinal hernia. The aim is to determine the feasibility, safety and long-term outcome of two port TEP for laparoscopic inguinal hernia repair.

II. Material And Methods

Following institutional approval, data was prospectively collected for 45 patients presenting with inguinal hernia from January 2018 to June 2019. Two-port laparoscopic TEP was offered as first-line treatment for all patients over the study duration. However, indications for open repair included previous lower abdominal

surgery, large hernias not amenable to laparoscopic techniques or patient preference. All patients were consented for the possibility of additional port placement and conversion to open repair. All patients who underwent laparoscopic inguinal hernia repair were included in the study.

Prior to surgery, all the patients received operative clearance. Two-port repair was attempted in all patients. Patients demographics at the time of surgery, indications for surgery, hernia laterality and type, operative times and major intraoperative complications including bowel, bladder, vascular, or nerve injury were collected. All patients were discharged on postoperative day 2 -3.

Patients were followed-up for 3 months at our out-patient department for development of postoperative complications including seroma, hematoma, surgical site infection, chronic inguinal pain lasting greater than 3 months and hernia recurrence.

Two-port technique:

The operation performed was a modification of the technique, first described by McKernan and Laws in 1993.

After administration of general anaesthesia, all port sites were anaesthetised with 0.5 % bupivacaine with epinephrine to assist with intraoperative hemostasis and postoperative analgesia. A 10 mm incision was made inferior to the umbilicus and extended upto the level of the linea alba. The anterior rectus sheath was sharply incised, taking care not to enter the peritoneum.

A 10 mm trocar was introduced into the preperitoneal space followed by insufflation to 15 mm Hg with carbon dioxide and some amount of pneumo-preperitoneum was established. A 30 deg scope was inserted and blunt dissection was done to create preperitoneal space.

Under direct visualization, a second 5 mm trocar was placed through the midline approximately 3 cm inferior to the first trocar. Dissection was performed first with a Maryland forceps, to skeletonise and accurately identify all cord structures. The dissection was adequate even with one working instrument. Following reduction of the hernia sac, a 10 * 15 cm polypropylene mesh was positioned to cover the hernia defect including the direct and indirect spaces. Pneumo-preperitoneum was released while the mesh was visualized to maintain proper alignment.

The 10 mm trocar site was closed with No.1 polyglactin 910 suture in the fascial layer. The skin at both port sites closed with 2-0 polyamide sutures and sterile dressing applied.

Patients were discharged on postoperative day 2-3. Patients were followed-up at our out-patient department for 3 months.

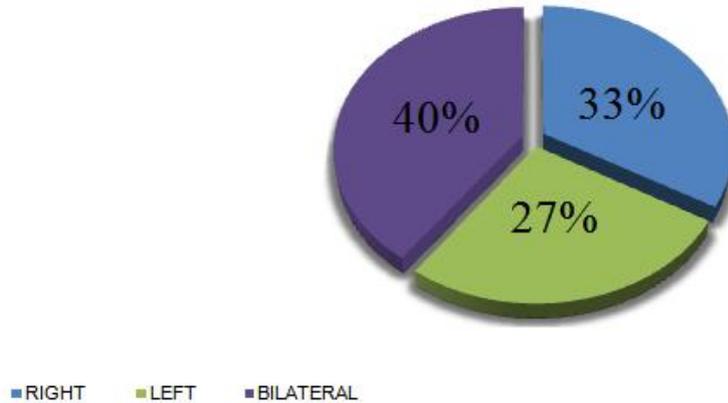
III. Results

45 patients underwent two-port TEP out of 92 inguinal hernia cases. Patient demographics and hernia characteristics are displayed in Table & Graph 1. Mean age was 45.4 years. All 45 patients were males in the study. All operations were performed on an elective basis. 42 (93.3%) cases were for primary repair and 3 (6.6%) were for hernia recurrence following open repair. No patients had evidence of strangulation during preoperative examination. 12 hernias (26.6%) were found on the left, 15 (33.3%) on the right, and 18 (40%) were bilateral.

TABLE 1. Patient demographics and hernia characteristics

VARIABLE	NUMBER (%)
TOTAL PATIENTS	45
MALE	45
FEMALE	0
MEAN AGE (Years)	45.4
INDICATION FOR SURGERY	
PRIMARY REPAIR	42 (93.3%)
RECURRENT	3 (6.6%)

GRAPH 1: Hernia laterality

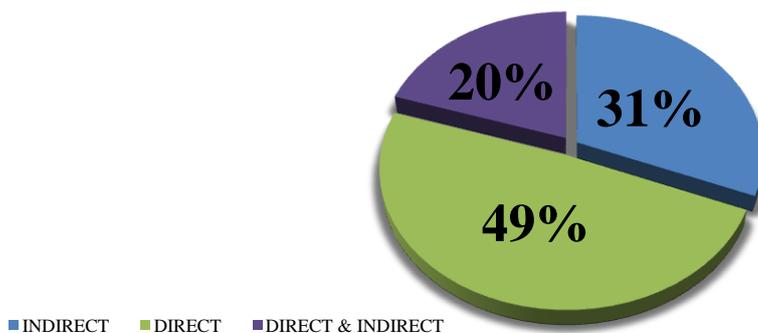


Operative data are displayed in Table & Graph 2. Operative time was calculated from time of skin incision to closure. Mean operative time for unilateral repair was 48.5 min. Mean operative time for bilateral repair was 63.7 min. 14 (31.1 %) cases were indirect defects, 22 (48.8 %) had direct defects, and 9 (20 %) had both direct and indirect component. 3 (6.6 %) operations required the addition of a third port to reduce the hernias. 1 (2.2 %) of these cases was converted to open repair, as the hernia remained irreducible despite the addition of a third port. None of the cases had major intraoperative complications including significant bleeding, bowel, bladder, vascular, or nerve injury.

TABLE 2. Operative data

VARIABLE	NUMBER (%)
OPERATIVE TIME (mins)	
UNILATERAL	48.5
BILATERAL	63.7
INTRA OPERATIVE COMPLICATIONS	
PORT ADDITION	3 (6.6%)
CONVERSION TO OPEN REPAIR	1 (2.2%)

GRAPH 2: Hernia laterality



Postoperative complications are displayed in Table 3. 5 (11.1 %) of them experienced some form of postoperative complication. Commonly occurring sequelae of laparoscopic inguinal hernia repair including seroma and hematoma were observed in 2 (4.4 %) and 1 (2.2 %) cases respectively. None of these required drainage and all resolved spontaneously. 2 (4.4 %) patients developed local rise in temperature, erythema and tenderness around the incision and were clinically diagnosed as surgical site infection. No one required explantation of mesh. No patients experienced port-site herniation. 1 (2.2 %) patient had recurrence at the end of the follow-up period.

TABLE 3. Post-operative complications

VARIABLE	NUMBER (%)
SEROMA	2 (4.4 %)
HEMATOMA	1 (2.2 %)
SURGICAL SITE INFECTION	2 (4.4 %)
HERNIA RECURRENCE	1 (2.2 %)

IV. Discussion

This study was aimed at determining the feasibility, safety, and efficacy of two-port TEP repair. A laparoscopic TEP was successful in 97.7 % of cases with 93.3 % completed using the modified two-port technique. This suggests the two-port procedure is technically feasible. In one case we were unable to complete the procedure laparoscopically, hence was converted to open repair. This represents the limitation of laparoscopic inguinal hernia repair. Therefore, the actual success rate of two-port TEP is slightly higher at 95.4 %.

There is definitely a steeper learning curve associated with using fewer ports. Initially the surgeon began the operation with two ports and later added an additional port when difficulties arose during dissection to complete the operation. Now that we have gathered experience with this less invasive technique, the addition of the third port has become less frequent.

We have observed that by reducing the number of working ports the dissection becomes more challenging, resulting in increased operative time. Our mean operative time for unilateral repair and bilateral repair was 38.5min and 63.7min respectively. Our operative time was similar to the range of 50–80 min, reported by studies using three ports^{1,2} and studies with two ports.³ Therefore, using one less port did not impede the surgeon's ability to efficiently perform TEP.

A limitation of our study is that the operative time was calculated for a single surgeon, who was proficient in the technique. Our operative times are comparable to those reported by Basu et al⁴ in his study of two port TEP by multiple surgeons at different institutions.

We have not used a balloon dissector for creating a plane in pre-peritoneum. Therefore, this study demonstrates that two-port technique is feasible even without the use of a balloon dissector.

To conclude, the two-port TEP is a feasible method of inguinal hernia repair. The two-port method was performed successfully in 95.4 % of cases, without the use of a balloon dissector and with operative time comparable to currently reported time by conventional TEP.

About 11.1 % of patients had some form of postoperative complication. Most of these complications were minor including seroma and hematoma. None of our patient experienced chronic inguinal pain. However, the pain may be secondary to tack fixation or mesh placement as suggested in other studies⁵⁻⁷. Current meta analyses report rates of chronic pain after three port TEP with mechanical mesh fixation to range from 2 to 11 %^{1,2}. Therefore, the two-port technique is equally as safe as three-port TEP^{1,2}.

The efficacy of the procedure was assessed by hernia recurrence rate in the long term. Recent studies have suggested the rate of recurrence for conventional TEP ranges from 2 to 3 %^{1,2}. In our study, one patient had hernia recurrence within a minimum follow-up time of 3months. Since follow-up times vary significantly between studies, it is difficult to accurately compare rates of recurrence across other institutions.

This study did not address the overall cost, postoperative pain, patient satisfaction, and resumption of normal activities following the procedure.

What is the clinical significance of reducing a single port from the TEP procedure?

There is one less opportunity for surgical site infection, port-site herniation, and inadvertent injury to major surrounding structures during the introduction of trocar. The technique results in one less scar and improved cosmesis.

V. Conclusion

Our results were comparable to conventional three-port repair in terms of intraoperative complications, postoperative complications and hernia recurrence. Therefore, the two-port TEP appears to be a feasible, safe and effective method for inguinal hernia repair and hence should be considered as a viable, less invasive alternative to conventional three-port TEP repair.

References

- [1]. Bobo Z, Nan W, Qin Q, Tao W, Jianguo L, Xianli H (2014) Meta-analysis of randomized controlled trials comparing Lichtenstein and totally extraperitoneal laparoscopic hernioplasty in treatment of inguinal hernias. *J Surg Res* 192(2):409–420
- [2]. ZhuX, CaoH, MaY, YuanA, WuX, MiaoY, GuoS(2014) Totally extraperitoneal laparoscopic hernioplasty versus open extraperitoneal approach for inguinal hernia repair: a meta-analysis of outcomes of our current knowledge. *Surg J R Coll Surg Edinburgh Ireland* 12(2):94–105
- [3]. M. A. Fuglestad, S. J. Waisbren. Two-port totally extraperitoneal inguinal hernia repair: a 10-year experience (2016) 20: 423.
- [4]. Basu S, Chandran S, Somers SS, Toh SK (2005) Cost-effective laparoscopic TEP inguinal hernia repair: the Portsmouth technique. *Hernia J Hernias Abdom wall Surg* 9(4):363–367
- [5]. Kurmann A, Fischer H, Dell-Kuster S, Rosenthal R, Audige L, Schupfer G, Metzger J, Honigmann P (2015) Effect of intraoperative infiltration with local anaesthesia on the development of chronic pain after inguinal hernia repair: a randomized, triple- blinded, placebo-controlled trial. *Surgery* 157(1):144–154
- [6]. Sajid MS, Leaver C, Baig MK, Sains P (2012) Systematic review and meta-analysis of the use of lightweight versus heavyweight mesh in open inguinal hernia repair. *Br J Surg* 99(1):29–37
- [7]. Taylor C, Layani L, Liew V, Ghusn M, Crampton N, White S (2008) Laparoscopic inguinal hernia repair without mesh fixation, early results of a large randomised clinical trial. *Surg Endosc* 22(3):757–762

Dr. Anandaravi B N “Two Port Totally Extra Peritoneal Inguinal Hernia Repair - Our Experience at a Tertiary Care Hospital.” *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 12, 2019, pp 66-70.