Original Article

Early Experience of Total Extraperitoneal Inguinal Hernia Repair

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Abstract

Objective: Inguinal hernia is a common surgical condition. Open hernioplasty is a traditional procedure practiced for decades all over the world. But the newer procedure of Total Extraperitoneal (TEP) inguinal hernia repair is the current trend in Western World. Researchers are trying to cope with the recent trend and initiate and practice TEP in BIRDEM.

Methods: This observational analytic study was done during April 2012 and March 2015. All inguinal hernia patients reporting to BIRDEM outpatient department were approached for TEP. Those who consented were treated electively with a TEP repair for a unilateral or bilateral hernia defect, either direct or indirect. A total of 50 patients, all adult males (over 18 years) were included in this study. All procedures were completed with patients under GA. Polypropylene mesh was placed in preperitoneal space. All patients were followed up in outpatient department in one week, one month, one and two years after surgery. Patients' age, hernia types and locations, complications, length of stay in hospital, return to work and recurrence were noted.

Results: Patients' age was between 22years and 72years. All of them had primary hernias and 72% of them underwent unilateral repairs. None of the cases required conversion to TAPP or anterior procedures. In two patients (4%) intraoperative complication occurred and post-operative courses were complicated in 3 patients (6%). Patients were able to resume their daily activities after a mean period of 7 days (3 to 10 days). None required a readmission and there were no mortality.

Conclusion: In patients with uncomplicated inguinal hernias, TEP is associated with a very low overall risk of serious complications and recurrence with a very good functional outcome. It is equally applicable with bilateral inguinal hernias as well, without added risk. It must be concluded that it is very much possible to perform TEP successfully even with limited resource and without any added expenditure.

Key words: Inguinal hernia, Total Extraperitoneal (TEP)

Introduction:

Inguinal hernia repair is one of the most common surgery and over twenty million procedures are done every year across the globe[1,2]. The most common standard open technique of tissue based suture repair had few changes over a hundred years[3]. Use of a synthetic mesh for a tension free repair has revolutionized hernia surgery with a significantly lower recurrence rate[2,4] and lower chronic post-operative pain[5]. The development of laparoscopic technique to cover the myopectineal orifice with a mesh placed in preperitoneal space might be the next big change in hernia repair[3, 6].

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Since the first reported case in 1992[7] endoscopic repair of inguinal hernia is becoming an increasingly popular method (16.8% to 41%) in USA[8, 9] as an alternative to open hernioplasty. This minimally invasive technique has the benefits of lower wound infection, faster wound recovery, reduced post-operative stay, less pain, better cosmetic outcome, and earlier return to physical activity and work[5, 10-14] and less chronic pain[15]. Disadvantages of the technique include a higher risk of serious intraoperative complications, has to be performed under general anaesthesia and sizeable learning curve to master the technique[5, 10, 16]. Among the two alternative approaches Trans Abdominal Pre Peritoneal (TAPP) and Total Extra Peritoneal (TEP), some author concluded that both are safe and effective[17,18], while others preferred TEP since it can avoid entry into the peritoneal cavity and consequently, possible intraperitoneal complications[6]. Since 2010, TEP has been performed in this hospital. In the present study, outcome of TEP inguinal hernia repair (IHR) was analyzed.

Methods:

An observational analysis was done in all cases of inguinal hernia who had undergone TEP repair between April 2012 and March 2015. A total of 50 patients were treated electively with TEP repair for a unilateral or bilateral hernia defect. They were either direct or indirect inguinal hernia cases. A total of 64 procedures were done, where bilateral repair was counted as two separate surgical procedures. All adults (over 18 years) were included in the study including patients who had concomitant procedures at the same time of inguinal hernia repair. Patients with incarcerated hernia and those deemed unsuitable for surgery under general anaesthesia (GA) were excluded from the study. All the procedures were performed on an ambulatory care basis. Post-operative follow up was made in the outpatient department.

Patients were asked to void just before operation. All procedures were completed with patients under GA and supine Trendelenberg position with upper limbs tucked at the sides.

An infraumbilical vertical incision of 1.5 cm was made, blunt dissection of subcutaneous fat was done to expose the Linea Alba which was opened transversely and care was taken not to breach the parietal peritoneum. Blunt dissection was made with a hemostat in the extraperitoneal space aimed towards the pubis in the midline. A 10 mm trocar was placed, carbon dioxide inflation was done and a pressure of 10-12 mm was maintained. A zero degree 10 mm telescope was introduced and blunt dissection was done with the tip of the telescope keeping close to the peritoneum, first towards the pubis and then to the side of the hernia to the level of the anterior superior iliac spine. Indirect hernia sac was reduced high enough to hold down behind the mesh at the conclusion of the procedure. Medial dissection was extended across the midline to opposite side halfway to epigastric vessels. Poly-propylene mesh (15x10 to 15x12 cm^2 sizes) was folded in halfway with 3 sutures. Then folded completely and introduced through the 10 mm cannula, then freed, half uncurled and laid flat to cover the space below the inguinal ligament. Spiral tacks were then used to fix the mesh. The sutures were then removed to uncurl the other half of the mesh to cover the space above the inguinal ligament, thus covering the hernia sites – inguinal, femoral and obturator. A similar technique was performed on the opposite side if warranted. The hernia sac was placed behind the mesh, hemostasis secured, deflation and closure of the fascial and skin incision were performed.

All patients were followed up in outpatient department in one week, one month, one and two years after surgery. Date analysis was done in following outcome items- Patients' age, hernia types and locations, complications, length of stay in hospital, return to work and recurrence.

Results:

Between April 2012 and March 2015 a total of 50 consecutive adult patients underwent TEP IHR under GA (Table I & II). All of them were men with age range 22 to 72years.

Thirty two percent having an American society of Anesthesiologists (ASA) score of 1, 62% of 2 and remaining 6% an ASA score 3. Mean duration of complaints was 2 years (3 months to 12 years). All of them had primary hernias and 72% of them underwent unilateral repairs. None of the cases required conversion to TAPP or anterior procedures. The mean operation time for unilateral and bilateral cases was 55(45 to 65) minutes and 85(70 to 100) minutes respectively.

In two patients (4%) intraoperative complication occurred and post-operative courses were complicated in 3 patients (6%) (Table III). Excessive bleeding during operation occurred in 2 patients, one while the peritoneum was peeling off from obturator area and another due to injury to a branch of the epigastric vessel during retraction of the peritoneum off the triangle of doom. Both were managed endoscopically by gauze pressure and limited cautery. None required blood transfusion, none of the complications was associated with general anaesthesia. Two patients developed seromas noticed at one month follow up and were managed expectantly. In one patient recurrence was observed in 1 year follow up that was subsequently treated with a Lichtenstein procedure.Post-operative pain was mild in all case. Two patients complained of persistent pain at one month which were treated by reassurance and analgesics. Patients were able to resume their daily activities after a mean period of 7 days (3 to 10 days). None required a readmission and there were no mortality.

Table I : Age distribution of the patients (n=50)

Age (yrs)	**21-30**	**31-40**	**41-50**	**51-60**	**>60**
No. of pts	5	11	14	11	9

Table II: Patient and hernia characteristics

Variables	Data
ASA	
1	16(32%)
2	31(62%)
3	3(6%)
Location of Hernia	
Unilateral	36(72%)
Bilateral	14(28%)
Duration of complaints	2 years (3months-12years)
Number of procedures	64
Duration of operation	
Unilateral	55(45 to 65) minutes
Bilateral	85(70 to 100) minutes

Table III: Complications

Variables	Data
Mortality	0(0%)
Intraoperative Complication	
Bleeding	2(4%)
Postoperative Complication	
Seroma	2(4%)
Recurrence	1(2%)

Discussions:

All the patients in the present study of inguinal hernia were male, as we found in open surgery as well. The reason behind very low incidence of female groin hernia surgery in our setup may be due to socioeconomic and religious state. The incidence of bilateral inguinal hernia has been variably reported in literature based on clinical examination alone (6%)[19], routine contralateral exploration[20] and with laparoscopy[21, 22]. We offered and did bilateral TEP IHR in those presented with bilateral inguinal hernias and those with a unilateral direct inguinal hernia as the incidence of future development of a direct hernia on the other side is more in case of direct inguinal hernia.

All of our cases were done under GA

any anaesthesia related hazards. In the post-operative period ketorolac trimethamine was our analgesic of choice unless contraindicated when tramadol hydrochloride was the alternative. None required pethedine or morphine.

The mean operation time for unilateral case was about an hour or so, those for bilateral cases 85 minutes. Literatures suggested that operation time depends on the experience of the surgeon and it drops below an hour only after a century of procedures were performed[23]. TEP has a long learning curve compared to Trans-Abdominal-PrePeritoneal (TAPP) hernioplasty procedure[24].

Bleeding occurred intraoperatively twice during very early cases, certainly related to inception with the new procedure, though not severe, not eventful, this never happened once surgeon became familiar with the relatively avascular pre peritoneal space and dissecting closer to peritoneum.

This study does not encounter bladder or bowel injury though some publications reported TEP procedures to have higher incidence of serious perioperative complications than open procedures[25, 26]. Another study reported that bilateral TEP was associated with significantly higher reoperation and urinary bladder injury ralated[27] while Mark A et al suggested that bilateral repair does not have notably higher risks or mortality than a unilateral repair[28]. Seroma in the inguinal area were encountered in two patients and none required intervention. Flore Varcus et al also reported that many patients had some degree of seroma that did not require drainage[3]. Lau et al concluded that old age, large hernia defects, scrotal hernias and left behind residual distal sac were associated with seroma formation[29].

The strength of the study is inclusion of all uncomplicated cases who were willing to undergo TEP IHR. Limitation of the study is its modest number of cases and potential selection bias as a substantial number of patients were excluded as they were operated by an anterior approach during study period due to financial constraints.

Conclusion:

In patients with uncomplicated inguinal hernias TEP is associated with a very low overall risk of serious complications and recurrence with a very good functional outcome. It is equally applicable with bilateral inguinal hernias as well without added risk.

References:

1. Bittner R, Schwarz J, Inguinal hernia repair: current surgical techniques. Lagenbecs Arch Surg. 2012; 397:271-82.
2. Poelman MM, van den Heuvel B, Deelder JD, et al. EAES Consensus Development Conference on endoscopic repair of groin hernias. Surg Endosc. 2013; 27:3505-19.
3. Flore Varcus, Ciprian Duta, Amadeus Dobrescu, Fuger Lazar, Marius Papurica, Cristi Tarta. Laparoscopic repair of inguinal hernia TEP versus TAPP. Chirurgia 2016;111:308-12
4. Basile F, Biondi A, Donati M. Surgical approach to abdominal wall defects: history and new trends. Int J Surg.2013; 11 (suppl):s20-s23.
5. Simons MP, Aufenacker T, Bay-Nielsen M et al. European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. Hernia. 2009; 13:343-403.
6. Nidal Assa, Gil Ahana, Gil Nissim Bachar, Eldad Powsnwer. Long-term outcome of laparoscopic Totally Extraperitoneal Repair of bilateral inguinal Hernias with a large single mesh. World J Surg 2016;40:291-7.
7. Arregui ME, Davis CJ, Yucel O, Nagan RF. Laparoscopic mesh repair of inguinal hernia using a preperitoneal approach: a preliminary report. Surg Laparosc Endosc. 1992; 2(1):53-8.
8. Miserez M, Peeters E, Aufenacker T, et al. Update with level 1 studies of the European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. Hernia. 2014; 18:151-163.
9. Saleh F, Okrainec A, D'souza N, Kwong J, Jackson TD. Safety of laparoscopic and open approaches for repair of the unilateral primary inguinal hernia: an analysis of short-term outcomes. AM j Surg. 2014; 208:195-201.
10. Eker HH, Langeveld HR, Klitsie PJ, et al. Randomized clinical trial of total extraperitoneal inguinal hernioplasty vs Lichtenstein repair: a long term follow-up study. Arch Surg.2012; 147:256-60.
11. Bracale U, Melillo P, Pignata G, Di Salvo E, Rovani M, Merola G, et al. Which is the best laparoscopic approach for inguinal hernia repair: TEP or TAPP? A systemic review of the literature with a network meta-analysis. Surg Endosc 2012; 26:3355-66.
12. Heinford BT, Park A, Ramshaw BJ, Voeller G. Laparoscopic repair of ventral hernias: nine years' experience with 850 consecutive hernias. Ann Surg. 2003; 238(3):391-9.
13. Meyer A, Blanc P, Balique JG, Kitamura M, Juan RT, Delacoste F, Atger J. Laparoscopically extra-peritoneal inguinal hernia repair: twenty-seven serious complications after 4565 consecutive operations. Rev Col Bras cir. 2013 Jan- Feb; 40(1): 32-6.
14. Pawanindra Lal, Philips P, Chander J, Ramteke VK. Is unilateral laparoscopic TEP inguinal hernia repair a job half done? The case for bitateral repair. Surg Endosc 2010; 24:1737-45.
15. Turrentine FE, Wang H, Simpson VB, Jones RS(2006) Surgical risk factors, morbidity and mortality in elderly patients. J Am Coll Surg 203(6):865-77.
16. Zhu X, Cao H, Ma Y, Yuan A, Wu X, Miao Y, Guo s (2014) Totally extraperitoneal laparoscopic hernioplasty versus open extraperitoneal approach for inguinal hernia repair : a meta-analysis of outcomes of our current knowledge. Surgeon 12(2):94-105.
17. Bittner R, Arregui ME, Bisgaard T, et al. Guidelines for laparoscopic (TAPP) and endoscopic (TEP) treatment of inguinal hernia International Endohernia Society (IEHS). Surg Endosc.2011; 25:2773-843.
18. Antoniou SA, Antoniou GA, Bartsch DK, et al. Transabdominal peritoneal versus totally extraperitoneal repair of inguinal hernia:a meta-analysis of randomized studies. Am J Surg. 2013; 206:245-52.e1.
19. Akin ML, Karakaya M, Batkin A, Nogay A. Prevalence of inguinal hernia in otherwise healthy males of 20 to 22 years of age. J R Army Corps. 1997; 143(2): 101-2.
20. Tackett LD, Breuer CK, Luks FI, Caldamone AA, Breuer JG, DeLuca FG, et al. Incidence of contra lateral inguinal hernia: a prosopective analysis. J Pediatr Surg. 1999; 34(5):684-7; discussion 687-8.
21. Griffin KJ, Harris S, Tang TY, Skelton N, Reed JB, Harris AM. Harris incidence of contralateral occult inguinal hernia found at the time of laparoscopic transabdominal pre-peritoneal (TAPP) repair. Hernia. 2010; 14(4):345-9. Doi: 10.1007/s10029-010-0651-6. Epub 2010 Apr 1.

22. O'Rourke Al, Zell JA, Varkey-Zell TT, Barone JL, Bayona M. Bayona, Laparoscopic diagnosis and repair of asymptomatic bilateral inguinal hernias. Am J Surg. 2002; 183(1): 15-9.
23. Ramshaw B, Shuler FW, Jones HB, Duncan TD, White J, Wilson R, et al. Laparoscopic inguinal hernia repair: lessons learned after 1224 consequtive cases. Surg Endosc.2001; 15 (1):50-4.
24. Vidovic D, Kirac I, Galvan E, Filipovic- Cugura J, Ledinsky M, Bekavac- Beslin M. Laparoscopic totally extraperitoneal hernia repair versus open Lichtenstein hernia repair: results and complications. J Laparoendosc Adv Surg Tech A.2007; 17(5):585-90.
25. Kouhia S, Vironen J, Hakala T, Paajanen H. Open mesh repair for inguinal hernia is safer than laparoscopic repair or open non-mesh rtepair: A Nationwide registry Study of Complications. World J Surg.2015; 39:1878-84.
26. Gass M, Banz VM, Rosella L, Adamina M, Candinas D, Guller U. TAPP or TEP? Population based analysis of prospective data on 4,552 patients undergoing endoscopic inguinal hernia repair. World J Surg. 2012; 36:2782-6.
27. F Kockerling, C Schug-Pass, D Adolf, T Keller, A Kuthe. Bilateral and unilateral total extraperitoneal inguinal hernia repair (TEP) have equivalent early outcomes: Analysis of 9395 cases. World J Surg 2015;39: 1887-94.
28. Mark A. Reiner, Erin R. Bresnahan.Laparoscopic Total Extraperitoneal Hernia Repair Outcomes.JSLS 2016; 20:1-11.
29. Lau H, Lee F, Seroma following endoscopic extraperitoneal inguinal hernioplasty. Surg Endosc. 2003; 7(11):1773-7. Epub2003 Jun17.