

The Outcome of the Transinguinal Pre-Peritoneal (TIPP) Hernioplasty in Groin Hernia Repair: An Observational Case Series

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ABSTRACT

Background: The repair of inguinoscrotal hernias is a very commonly performed operation in surgical units worldwide. There is still no gold standard for the operative management of groin hernias despite a myriad of techniques available. The open technique of groin hernia repair both anteriorly as well as posteriorly with a tension free mesh has decreased the occurrence of the postoperative pain as well as recurrence. The Lichtenstein tension free mesh hernioplasty has gained the position of reference technique in open groin hernia repairs. Chronic pain is the main postoperative complication in inguinal hernia repair after Lichtenstein's repair.

Aim: To decrease postoperative pain, the use of a mesh which is placed in preperitoneal space.

Methods: The study comprised of 120 consecutive adult patients who were fulfilling the inclusion criteria and treated with the trans-inguinal pre-peritoneal (TIPP) technique by the same surgical team. The primary endpoint was the early post-operative pain and the objectivity of pain was assessed by visual analogue scale (VAS) 24 hours post-operatively and the secondary endpoint was the hospital stay measured in days.

Results: Out of 120 Patients, 119 patients (99.2%) were male and only 1 patient (0.8%) was female with their mean age of 43.12, SD \pm 16.184 years. 49 patients (40.8%) were having left sided unilateral inguinal hernias while 71 patients (59.2%) having right sided unilateral inguinal hernias. 20 patients (16.7%) were diagnosed as having direct inguinal hernias while 100 patients (83.3%) were having indirect inguinal hernias, Mean VAS score at 24 hours post-operatively was noted as 3.73, SD \pm 1.442 with maximum VAS pain score 8 and minimum score 2, while the mean hospital stay in all the patients post-operatively was found to be as 1.27 days, SD \pm 0.24 days. None of the patients developed wound infection, 3 patients developed seroma formation which were managed conservatively.

Conclusions: The open preperitoneal hernia repair (Trans-inguinal pre-peritoneal mesh repair) is safe, feasible and effective technique. With this approach, there is reduced early post-operative pain and the hospital stay.

Keywords: Trans-inguinal, Pre-peritoneal, Mesh plasty (Mesh hernioplasty).

INTRODUCTION

Groin hernia repair is one of the cornerstones of a General surgery practice and is one of the most commonly performed procedures.

Inguinal hernia can be repaired by both Open and Laparoscopic technique. In order to perform an open repair both anterior technique via Lichtenstein repair or a posterior approach through placement of mesh in the pre peritoneal space through trans-inguinal pre-peritoneal repair is employed. In Pakistan, open anterior approach of inguinal hernia repair is widely used because it is easy to perform, less time consuming and the early results of Lichtenstein repair are encouraging with regards of safety and effectiveness¹. The pain and discomfort which occurs even months after surgery is one of the major drawbacks for hernia repair with the help of a tension free prosthesis.

The placement of a widely overlapping mesh in the pre-peritoneal space using the open posterior approach reinforces the strength of the transversalis fascia more sufficiently than the prosthesis placed anterior to the transversalis fascia². The perceived advantage of the pre-peritoneal approach is that of the prosthesis can be placed between hernia contents and the hernia defect. Furthermore, increase in intra-abdominal pressure serves

to push the mesh against the floor of the inguinal canal, unlike in anterior mesh placement where the mesh is pushed away^{3,4}.

Varying degree of controversy exist in the literature of the outcomes comparison of both open inguinal hernia techniques. Some studies clearly show that trans-inguinal pre-peritoneal (TIPP) repair is a good alternative to Lichtenstein tension-free technique^{5,6,7}.

Moreover the trans-inguinal pre-peritoneal (TIPP) repair has been associated with markedly less chronic pain. Numerous studies have confirmed that placement of prosthesis in the pre-peritoneal space resulted in less chronic pain⁷, Gram et al found in a randomized trial that incidence of chronic pain after pre-peritoneal repair was almost comparable with that of Lichtenstein repair⁵. Wright and Koning GG et al failed to prove reduced pain after pre-peritoneal approach in a prospective randomized controlled trial⁹.

Berrevet F et al showed that mean post operative pain score as measured by VAS (Visual analogue scale) at 24 hours post-operatively is significantly decreased in TIPP group as in comparison with the Lichtenstein group (Mean VAS 3.1 ± 1.55 vs. 6.9 ± 3.45 $p=0.001$) and mean hospital stay is lesser in TIPP (Trans-inguinal pre-peritoneal mesh repair) group as compared to Lichtenstein group (0.53 ± 0.48 vs. 1.16 ± 1.10)⁵. Also, trans-inguinal pre-peritoneal repair for inguinal hernia is not a routinely performed procedure in Pakistan.

Received on 02-01-2020

Accepted on 26-03-2020

This study was conducted to evaluate the outcome of the trans-inguinal pre-peritoneal (TIPP) repair in terms of post-operative pain and the hospital stay so that the exact figures of the trans-inguinal pre-peritoneal repair can be evaluated which may help to adopt this technique for inguinal hernia repair in our clinical practice and may provide a new horizons in open inguinal hernia repairs.

MATERIAL AND METHODS

This descriptive case series study was conducted at West Surgical Ward Mayo Hospital ,Lahore from July-December 2019. Sample size of 120 cases is calculated with 95% confidence level, $d= 0.30$ and taking expected mean \pm S.D of mean pain score i.e. 3.1 ± 1.55 of trans-inguinal pre-peritoneal repair (TIPP) in patients with inguinal hernia. Unilateral direct and indirect inguinal hernias of both males and females of age above 18 years of age were included in this study. While patients with bilateral, recurrent, acute obstructed, incarcerated or strangulated inguinal hernias were excluded from the study. Also patients with coagulation disorders and ASA grade III and IV and the patients not giving consents were excluded from the study. All patients who full filled the inclusion criteria were included through non-probability, purposive sampling. Data was obtained using a Performa. Data was entered and analyzed through SPSS version 17.

RESULTS

Out of 120 Patients, 119 patients (99.2%) were male patients and only 1 patient (0.8%) was female. Patients having 18 years and above were selected in this study and the mean age of the patients was found to be 43.12, SD ± 16.184 as shown in the, which means that most of the patients of this study were of middle aged. 49 patients (40.8%) out of 120 patients were having left sided unilateral inguinal hernias while 71 patients (59.2%) having right sided unilateral inguinal hernias. All the 120 patients had undergone Trans-inguinal pre-peritoneal mesh repair (TIPP) procedure and procedure was performed by consultant surgeons according to the technique described by Berrevoet F et al⁵. 20 patients (16.7%) out of 120 patients were diagnosed having direct inguinal hernias while 100 patients (83.3%) were having indirect inguinal hernias. Most of the patients i.e. 62 patients (51.7%) had VAS pain score after 24. hours of TIPP procedure of 4, while VAS pain score 2 is noted in 38 patients (31.7%), and in 18 patients (15.0%) the VAS pain score was found to be 6 while pain score of 8 is noted in only 2 patients (1.7%) patients. Mean VAS score is 3.73, SD ± 1.442 while mean hospital stay after TIPP procedure in all 120 patients was found to be 1.27 days, SD ± 0.24 as shown in the Table 1.

Table 1: Distribution of Mean Post operative pain as determined by the Visual analogue score (VAS) and Mean Hospital stay in days among the selected sample.

n	Variable	Mean	\pm S.D.
120	Pain(VAS) score	3.37	± 1.442
120	Hospital Stay	1.27	± 0.24

DISCUSSION

A multitude of procedures are there for the treatment of inguinoscrotal hernias There is still an ongoing discussions that what is the gold standard procedure for the treatment of these hernias but still there is no conclusive evidence available on the superiority of one technique over the other. Despite the fact that although recurrence rate continues to be one of the primary outcome after hernia surgeries but postoperative pain and hospital stay have gained considerable attention in the recent years. These indices determine the earlier return of the individual towards its productivity.

The rationale of TIPP (i.e. placing the prosthetic mesh in the pre-peritoneal space) will be delineated by employing the principles of Evidence based medicine¹⁴ in the form of questions and answers.

A. Why mesh repair rather than simple hernioraphy: In the last twenty to thirty years, the use of a prosthesis in the form of different meshes have greatly reduced the recurrence rates of these groin hernias¹⁷. The Advent of the mesh repairs such as Lichtenstein repair has revolutionized the groin hernias operation by decreasing the recurrences¹⁵ of these hernias to almost zero. there are a number of techniques that are employed for strengthening the weaknesses of the inguinal canal by placement of prosthesis anteriorly as in in Lichtenstein's repair¹⁶.or the placement of the mesh in the posterior approach ('upstream principle'), The laparoscopic (TAPP) or endoscopic (TEP) technique have already gained immense popularity.

B. Why placement of mesh in Preperitoneal space rather than placing it anterior to the Transversalis fascia: The placement of prosthesis in the preperitoneal space, has many distinct advantages especially when the prosthesis overlies the abdominal wall defect in a tension free manner. The placement of a widely overlapping prosthesis in the pre-peritoneal space using the Open posterior approach reinforces the strength of the transversalis fascia more sufficiently than the prosthesis placed anterior to the transversalis fascia². The intra-abdominal pressure causes the mesh to be pressed against the abdominal wall, keeping it positioned, rather than pushing it away.

The placement of the prosthesis on top of the anterior rectus sheath as is being done in the Lichtenstein repair, does not benefit from this physiological principle and needs fixation.. In contrast the upstream technique in which the mesh is placed posteriorly does not require any sort of fixation. The preperitoneal placement of mesh is a good technique keeping in view the biomechanical principles.

C. Why to use open technique rather than endoscopic approach for groin hernias repair: The endoscopic techniques of hernia repairs are employed mostly for preperitoneal placement of mesh. In spite of published favourable data of both Minimal Access approaches (TAPP and TEP), various reasons can be put forward to debate their superiority over the open repair of groin hernias. Minimal Access Techniques are quite difficult to comprehend, grasp and have longer learning curves, and

the instruments employed for these surgeries are not cost-effective^{18,19}. The minimal access techniques need to be performed under general anaesthesia. The Minimal Access Techniques are fraught with haphazards such as visceral and major vascular injuries. Although with the advent of didactic training the rate of these complications has decreased considerably.

The TIPP technique is an open pre-peritoneal placement of a prosthesis, and has the following advantages:

The use of a prosthesis has greatly decreased the incidence of shrinkage of the mesh even in the long run as was substantiated by ultrasonography more than 6 months after surgery. Moreover, the prosthesis covers all the weak anatomical regions of the groin. By evidence based medicines principles it is confirmed that 9% of the recurrences following tension free prosthetic repairs are femoral hernias. It is also being substantiated that more than half of patients with a femoral hernia have an inguinal hernia repair²⁰ done previously. In our study, no patient is diagnosed as having a femoral hernia while operating for unilateral inguinal hernia that was diagnosed preoperatively. However, placing mesh in preperitoneal space (PPS) covers the femoral opening and prevents the formation of a groin hernia in future.

CONCLUSION

Trans-inguinal pre-peritoneal (TIPP) repair of inguinal hernia is feasible and effective technique for surgeons routinely performing the open Lichtenstein repair but looking for modifications concerning post-operative pain relief and placement of mesh in pre-peritoneal space, the trans-inguinal pre-peritoneal (TIPP) mesh repair is a feasible and effective alternative.

REFERENCES

- Nadim K, M. Naeem, Adil B, Asadullah, Muzaffaruddin S, Haris H. Early outcome of Lichtenstein technique of tension-free open mesh repair for inguinal hernia. *J Ayub Med Coll* 2008; 20: 29-33.
- Fenoglio ME, Bermas HR, Haun WE, Moore JT. Inguinal hernia repair: results using an open preperitoneal approach. *Hernia* 2005; 9: 160-1.
- Sherman V, Macho J. R, Brunicardi F.C, Preperitoneal Repairs, Schwartz's Principles of Surgery, 9th edition 2010; 37:1323-24.
- Koning G.G, de Schipper J.P, Oostvogel H.J.M, Verhofstad M.H.J, Gerritsen G.P, van Laarhoven C.J.H.M, et al. The Tilburg double blind randomised controlled trial comparing inguinal hernia repair according to Lichtenstein and the transinguinal preperitoneal technique. *Trials* 2009; 10: 89.
- Berrepoet F, Maes L, Reyntjens K, Rogiers X, Troisi R, de Hemptinne B. Transinguinal preperitoneal memory ring patch versus lichtenstein repair for unilateral inguinal hernias. *Langenbecks Arch Surg* 2010; 395: 557-62.
- Maillart J.F, Vantourhouth P, Piret-Gerard G, Farghadani H, Mauel E. Transinguinal Preperitoneal groin hernia repair using a preperitoneal mesh preformed with a placement memory ring. *Hernia* 2011; 15: 289-295.
- Koning G.G, Patrick W.E.Vriens. Anterior preperitoneal repair of extremely large inguinal hernias: An alternative technique. *Int J Surg Case Rep.* 2012; 3: 45-48.
- Nienhuijs S, Staal E, Keemers-Gels M, Rosman C, Strobbe L. Pain after open preperitoneal repair versus Lichtenstein repair: a randomized trial. *World J Surg* 2007; 31: 1751-1757.
- Koning GG, Koole D. De Jongh MA, De Schipper JP, Verhofstad MH, Oostvogel HJ, Vriens PW, The transinguinal preperitoneal hernia correction vs Lichtenstein's technique; is TIPP top? *Hernia* 2011; 1: 19-22.
- Pe'lissier EP, Blum D, Ngo P, Monek O. Transinguinal preperitoneal repair with the Polysoft patch: prospective evaluation of recurrence and chronic pain. *Hernia.* 2008; 12:51-56.
- Pe'lissier E, Ngo P. Subperitoneal inguinal hernioplasty by anterior approach, using a memory-ring patch. Preliminary results. *Ann Chir.* 2006; 131:590-594.
- Pe'lissier EP, Monek O, Blum D, Ngo P. The Polysoft patch: prospective evaluation of feasibility, postoperative pain and recovery. *Hernia.* 2007; 11:229-234.
- Berrepoet F, Sommeling C, De Gendt S, Breusegem C, de Hemptinne B. The preperitoneal memory-ring patch for inguinal hernia: a prospective multicentric feasibility study. *Hernia.* 2009; 13:243-249.
- Keus F, Wetterslev J, Gluud C, van Laarhoven KCJHM. Evidence at a glance: error matrix approach for overviewing available evidence. *BMC Med Res Methodol.* 2010; 10:90.
- Kumar S, Wilson RG, Nixon SJ, Macintyre IMC. Chronic pain after laparoscopic and open mesh repair of groin hernia. *Br J Surg.* 2002; 89(11):1476-1479.
- Koning GG, de Schipper HJ, Oostvogel HJM, Verhofstad MHJ, Gerritsen PG, van Laarhoven KCJHM, Vriens PWHE. The Tilburg double blind randomised controlled trial comparing inguinal hernia repair according to Lichtenstein and the transinguinal preperitoneal technique. *Trials.* 2009; 10:89.
- McCormack K, Scott N, Go PM, Ross SJ, Grant A, Collaboration the EU Hernia Trialists. Laparoscopic techniques versus open techniques for inguinal hernia repair. *Cochrane Database Syst Rev.* 2003.
- Kuhry E, van Veen RN, Langeveld HR, Steyerberg EW, Jeekel J, Bonjer HJ. Open or endoscopic total extraperitoneal inguinal hernia repair? A systematic review. *Surg Endosc.* 2007; 21:161-166.
- Wright D, O'Dwyer PJ. The learning curve for laparoscopic hernia repair. In: Cuschieri A, MacFadyen BV Jr (eds) *Seminars in laparoscopic surgery.* WB Saunders, Philadelphia, PA. 1998; 227-232.
- Itani KMF, Fitzgibbons RJ, Awad SS, Duh Q, Ferzli GS. Management of recurrent inguinal hernias. *J Am Coll Surg.* 2009; 209:653-658.