

Original Research Article

Cost effectiveness of TAPP (trans-abdominal pre-peritoneal inguinal hernia repair) over open inguinal Lichtenstein meshplasty

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Received: 05 February 2018

Accepted: 07 March 2018

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ABSTRACT

Background: Hernia surgery has undergone tremendous refinement in technique of various methods have been advocated by different authors but each has got its own merit. Laparoscopic Trans-abdominal Pre-Peritoneal inguinal meshplasty (TAPP) is a newer technique which results in less post-operative pain, better cosmetic result, improves recovery time. The aim of the study was to compare cost effectiveness and duration of hospital stay that occurs from both laparoscopic TAPP repair and Lichtenstein repair in patients of inguinal hernia.

Methods: The present study comprises 25 cases underwent open Lichtenstein mesh repair and 25 cases underwent laparoscopic (TAPP) repair. After surgery all patients were monitored carefully for pain, infection, cost effectiveness and hospital stay.

Results: In present study, Group A is having significantly more cost of treatment than Group B in unilateral. The hospital stay was significantly low in group A than Group B.

Conclusions: TAPP repair is more expensive compared to Lichtenstein's meshplasty, TAPP repair is associated with faster recovery as compared to open Lichtenstein meshplasty, hospital stay is lesser in TAPP as compared to open inguinal meshplasty.

Keywords: Cost effectiveness, Hernia surgery, Open Lichtenstein mesh repair, Trans-abdominal Pre-Peritoneal inguinal meshplasty

INTRODUCTION

A hernia is a protrusion of a whole or part of a viscous through the wall that contains it. Of the study of the many operations available in a general surgeon's armamentarium, that of hernia repairs has been written about repeatedly.¹

The rapid changes that have been witnessed in open approach surgeries, prosthetic materials and laparoscopic surgeries have made hernia surgery, a most interesting field of endeavor that demands renewed discipline and

dedication.² Though a variety of procedure are performed, none can be termed as an ideal procedure as each one is accompanied by various complications, the most significant being recurrence. In 1981, William Bull, one of the most prominent Surgeons, wrote of hernia repairs, "It is wise to estimate the value of given procedures by the relative proportions of relapses".³

The principles governing the modern techniques of inguinal herniorrhaphy were first described in the latter decades of the nineteenth century. There has been considerable debate over the years as to whether Henry

Marcy or Eduardo Bassini should have precedence in the claim that they developed these principles. In 1871, Marcy published a description of inguinal hernia repair entitled "A new use of carbolised catgut ligatures". Later, in 1892, he claimed to be the first surgeon to have repair the deep ring.⁴ In 1987, Lichtenstein published a report on his personal experience with over 6,000 inguinal hernia repairs. In this paper he described the routine use of polypropylene mesh to reinforce a plication repair for all direct and recurrent hernias.

The external-oblique aponeurosis was sutured behind the cord, which transplanted it to a subcutaneous position. After a follow-up of between two and fourteen years forty three (0.7%) recurrences were reported, the majority of which were attributed to excessive tension in the repair. Lichtenstein therefore refined his repair to avoid suture line tension. Capozzi et al. reported the use of prosthetic repair for all adult inguinal hernias excluding Nyhus type 1.⁵

In this series the posterior wall of the canal was reinforced using prolene mesh, which was fixed in place using a continuous prolene suture around the entire margin of the prosthesis. Laterally the mesh was split and sutured around the cord to reconstitute the deep ring. In this series two patients (0.3%) developed mesh infection and both settled with conservative treatment. Four recurrences (0.6%) were recorded from 651 patients followed up for an average of five years. Laparoscopic hernia repair has been developed over past decade with promising result, though large randomized comparison studies have been published. Today TAPP has become the standard of care in inguinal hernia. But, it has been criticized for technical difficulties, cost and long learning curve. The newly developed Trans Abdominal Pre-peritoneal laparoscopic repair (TAPP) combines the advantages of minor access surgery and mesh reinforcement of the groin. This approach is associated with early postoperative return to usual activities with very low recurrence.

In our Institution, inguinal hernia repair is one of the common surgeries performed daily. This study aims at studying the operative time, recurrence, complications, advantages, disadvantages, limitations, duration of hospital stay and the cost effectiveness between the open inguinal hernia mesh repair and laparoscopic Transabdominal Pre-peritoneal meshplasty [TAPP] and to arrive at a conclusion as to the best modality of

treatment after comparison of morbidity and recurrence of these procedures among them and in relation to standard published material so this study aims at studying the operative time, duration of hospital stay and the cost effectiveness between the open inguinal hernia mesh repair and laparoscopic Transabdominal Pre-peritoneal meshplasty [TAPP] and to arrive at a conclusion as to the best modality of treatment after comparison of morbidity and recurrence of these procedures among them and in relation to standard published material.⁶

METHODS

This is a prospective comparative study conducted at Dr. D.Y. Patil Medical College and Hospital And Research Centre, Pimpri, Pune- 18 between July 2014 to September 2016 on sample size-50 cases (2 groups of 25 patients each) where Group A for Laparoscopic Trans-abdominal Pre-peritoneal Repair (TAPP) and Group B for Lichtenstein Open Inguinal Meshplasty (LOIM). Institutional Ethical Committee clearance was obtained for the study. Informed and written consent of the patient was taken and included in the study.

In both the groups polypropylene mesh of appropriate size (3*6 inch) was used for meshplasty. Anaesthesia was given depending upon type of procedure. General anesthesia for Laparoscopic Trans-abdominal Pre-peritoneal approach (TAPP) and spinal anesthesia for LOIM repair was given. Patients were given injection cefotaxime 1 gram i. v before induction of anaesthesia. Skin was cleaned with 10% betadine solution and draped. Incision was taken as per the various port-placement for TAPP approach and standard and groin incision for LOIM approach. In both the groups, Patients discharged after doing check dressing on 5th post- operative day in LOIM and called for suture removal on 10th postoperative day. Patients who had discharge or signs of surgical site infections were kept in ward and observed for any wound gape. In TAPP, check dressing done on 2nd post-operative day and follow up on day 8th for suture removal.

RESULTS

The Table 1 shows hospital stay in group A and group B. The maximum mean stay is with group B i.e. 6.96 days followed by 2.76 days in group A. The hospital stay was significantly low in group A than Group B ($p > 0.05$).

Table 1: Comparison of hospital stay in group A and group B.

Parameter	Group A (n=25)		Group B (n=25)		t Value	P Value
	Mean	SD	Mean	SD		
Hospital stay (days)	2.76	0.78	6.96	3.56	5.75	<0.0001

The Table 2 shows cost of treatment in group A and group B. In unilateral the maximum mean cost of treatment stay was Rs.1502.1 in group A and Rs.1263 in group B and in bilateral Rs.1675 in group A and Rs.1550

in group B. Group A is having significantly more cost of treatment than Group B in unilateral ($P < 0.0001$) and not significant in bilateral ($p > 0.05$).

Table 2: Comparison of cost of treatment in group A and group B.

Parameter	Group A (n=25)		Group B (n=25)		t Value	P Value
	Mean	SD	Mean	SD		
Unilateral (Rupees)	1502.1	34.6	1263	114	9.40	<0.0001
Bilateral (Rupees)	1675	125	1550	86.6	1.75	0.14

DISCUSSION

The present study is a hospital based comparative study to compare the outcome of both Laparoscopic inguinal hernia mesh repair (TAPP) and Lichtenstein open inguinal hernia repair on the duration of hospital stay, cost of treatment. Total 50 cases were selected and 2 groups of 25 patients each were included. Group A-Laparoscopic repair (TAPP) and Group B-Lichtenstein open inguinal meshplasty (LOIM) in the study.

For hospital stay comparison in group A and group B the maximum mean stay with group B was 6.96 days followed by 2.76 days in group A. The hospital stay was significantly low in group A than Group B ($p > 0.05$) (Table 2). Similar results were obtained by Mallaya B et al (2016) they found average length of stay was 2.8 days for TAPP which was significantly less than Lichtenstein method (4.2 days). The reduction in hospital stay after laparoscopic repair is likely to lead to savings in hospital costs.

In case of cost of treatment comparison in group A and group B, the maximum mean cost of treatment with group A was Rs.1462 followed by Rs.1325 in group B. Group A is having significantly more cost of treatment than Group B ($p < 0.0001$) (Table 2).

In one study, it was showed that cost of treatment for TAPP is more as compared to open inguinal meshplasty.⁷ Similarly, In one study, In laparoscopic repair mesh placement, the approach may be TAPP (transabdominal preperitoneal) or TEP (totally extraperitoneal) is associated with longer learning curve and was costlier than open repair.⁸ Laparoscopic procedure increases cost by use of general anaesthesia and placement of tackers for fixation of mesh.

All laparoscopic repairs are more expensive than open repairs as reported by one study.⁹ In UK. While Lichtenstein method is easy to learn, safe even for beginners and cost effective.¹⁰

CONCLUSION

TAPP repair is more expensive and faster recovery as compared to open Lichtenstein meshplasty, but, hospital stay is lesser in TAPP as compared to open inguinal meshplasty, so TAPP is more cost effective.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Kashyap M, Singhade P, Bora R, Batra G, Rege I, Chakrabarti R et al. Cost effectiveness of TAPP (trans-abdominal preperitoneal inguinal hernia repair) over open inguinal Lichtenstein meshplasty. Int Surg J 2018;5:1812-4.