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A Prospective Hospital based study to compare the effectiveness and safety of Laparoscopic (TEP /TAPP) and conventional open (Lichtenstein) repair and there outcomes in the management of Inguinal Hernia.

General Surgery

KEYWORDS: Laparoscopic totally extra-peritoneal repair (TEP), Laparoscopic trans-abdominal pre-peritoneal repair (TAPP), Lichtenstein repair, Inguinal hernia.

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ABSTRACT

BACKGROUND: Inguinal hernia repair using mesh is one of the most frequently performed operations in general surgery. Traditionally, repair of an inguinal hernia has been by an open method, but laparoscopic techniques have recently been introduced and are increasing in popularity. The mesh can be placed using an open Lichtenstein technique or by laparoscopic (TAPP/ TEP) approach. The present study aims to compare early and late outcomes following laparoscopic (TAPP/ TEP) mesh repair with Conventional open Lichtenstein repair method in management of inguinal hernia.

AIMS AND OBJECTIVES: The aim of our study was to compare the effectiveness and safety of Laparoscopic (TAPP/TEP) and conventional open repair (Lichtenstein) in the treatment of inguinal hernia and their results were studied and compared in terms of various parameters like operating time, complications, post-operative pain, post-operative recovery, cost effectiveness and rate of recurrence.

METHODS: 100 cases of inguinal hernia admitted in Subharti medical college and hospital, Meerut from the period of October 2014 to January 2016 were selected on the basis of the non-probability (purposive) sampling method. Patients with uncomplicated direct and indirect inguinal hernias treated by open or laparoscopic (TEP /TAPP) method were included. 50 cases each was operated by Laparoscopic (TEP / TAPP) repair and open Lichtenstein hernia repair. Outcomes were compared in demographics and intra-operative details with post-operative data.

RESULTS: In the post operative period, wound infection developed in 2 case of open Lichtenstein hernioplasty. Hematoma at the operated site was found in each 1 case of open Lichtenstein hernioplasty & Laparoscopic inguinal hernia repair. Intra-operative peritoneal tear was seen in 5 case of Laparoscopic repair. The duration of hospitalization was 6.1 days (Mean) in open hernioplasty group where as 3.74 days in the laparoscopic group. The duration for surgery was significantly longer in the laparoscopic group around 34.96 mins in unilateral repair and 46.30 mins in Bilateral inguinal hernia repair. The cost of surgery was 5524 INR (Mean) in open Lichtenstein repair as compared to 7406 INR in Laparoscopic repair. The difference in cost of surgery was around 1882 INR, laparoscopic repair being costlier than open surgery. It may be due to use of laparoscopic instruments and general anaesthesia in case of laparoscopic repair of inguinal hernia as compared to spinal anaesthesia in open Lichtenstein repair. Pain was assessed using verbal pain rating scale. Severe pain was complained in 5 cases of open surgery as compared to none in laparoscopic inguinal hernia repair. 40 cases of laparoscopic inguinal hernia repair had mild pain post-operatively, as compared to 25 cases in open surgery. Rest of the cases was of Moderate pain. There was 1 recurrence in the laparoscopic hernia repair group as compared to 2 cases in open Lichtenstein repair group.

CONCLUSIONS: Since evidence in the literature does not point to either laparoscopic or open approaches, the clear superior procedure, surgeon preference and circumstantial influences will probably continue to dictate the approach employed in inguinal hernia repair. Laparoscopic TEP repair was safe with less complications, early hospital discharge and return to routine activities.

INTRODUCTION:

Inguinal hernia was repaired laparoscopically soon after the establishment of laparoscopic cholecystectomy as gold standard for cholelithiasis. However unlike laparoscopic cholecystectomy, which was very quickly accepted by the surgical community, laparoscopic hernia repair has remained a contentious issue since its inception. Inguinal hernia is one of the most common surgical problems and is a leading cause of work loss and disability (1). Open surgery for inguinal hernia has gone through many stages of development. Understanding of the hernia anatomy was appreciated and understood in the mid 1700's by means of dissection of cadavers. Two advancements which enabled the development of hernia surgery greatly were the aseptic technique and improvement of anaesthesia.

Eldorado Bassini was an Italian surgeon who described a durable inguinal hernia repair based on an understanding of inguinal (groin) anatomy. Shouldice developed an anatomic based surgical technique which produced a very low recurrence rate. From the 1940's various forms of synthetic polymers were used in inguinal hernia repair. Lichtenstein published the results of 6,321 patients followed for 2-14 years after inguinal hernia repair with polypropylene mesh in 1987. This approach revolutionized hernia repair (2). Today tension free mesh repair is regarded as gold standard (3). This technique is simple, safe and effective, with relapse rate of 0.7% (4).

Laparoscopic approach has markedly improved recovery time that prompted surgeons to attempt laparoscopic approach in hernia repair (5). Ger was the first surgeon to attempt the laparoscopic hernia repair (6). The open surgery techniques are gradually being replaced by the laparoscopic repair techniques viz. trans-abdominal pre-peritoneal repair (TAPP) and total extra-peritoneal repair (TEP) (7).

Recently, there are many reports comparing laparoscopic (TEP & TAPP) and open tension-free methods (8-10). Thus, we designed this study and reviewed our data to compare open Lichtenstein mesh repair and laparoscopic (TEP & TAPP) repair.

The operative time to perform primary inguinal repair has been reported as longer for Laparoscopic TEP compared to open repair. The mean difference in 36 of 37 randomized trials is 14.81 minutes (11). Patients experiences less pain after laparoscopic repair as compared to any open inguinal hernia repair. Complications were more commonly seen in Laparoscopic repairs earlier due to steep learning curve for the surgeons as compared to open approaches but nowadays it has become less after proper steps and protocols are followed (12,13).

Better post-operative outcomes have been reported with regards to

reduced postoperative pain and early return to daily activity (14). Also Laparoscopic approaches allow assessment and treatment of the co-existing contra-lateral side inguinal hernia during the same operation without the need for further surgical incisions (15).

MATERIALS AND METHODS:

A randomized clinical trial was conducted in Subharti medical college and hospital, Meerut from October 2014 to January 2016. A total of 100 patients of inguinal hernia were included in the study All males above 18 year of age presenting with Uncomplicated primary unilateral/ Bilateral, reducible, direct /indirect inguinal hernia, were included. Patients with co-morbid conditions were excluded. All patients were evaluated by history and clinical examination. They were allocated into two groups A and B according to patients choice and compliance of anaesthesia as laparoscopic (TEP /TAPP) inguinal hernia repair (Group A) was done under general anaesthesia and open Lichtenstein inguinal hernia repair (Group B) was done under spinal anaesthesia.

Outcome was compared in Intra-operative details with Post-operative data. Patient who came with recurrent inguinal hernia and congenital hernia were excluded from the study.

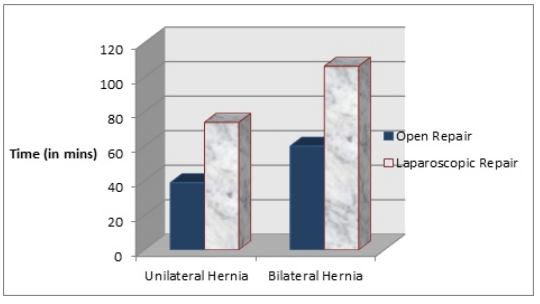
Frequency and percentages were calculated for all variables; intra-op and post- op complications, post operative pain, duration of hospital stay, cost of hospitalization, recurrence etc. Mean and standard deviation were calculated for numerical variables like age. For comparison of group A and group B Chi square test or Fisher's exact test was applied. A p-value of < 0.05 or less was taken as significant.

OBSERVATION AND RESULTS:

In the present study 50 cases underwent Lichtenstein repair while 18 cases TEP repair and 32 cases TAPP. The patients were chosen for the different surgeries according to anaesthetic compliance, as Laparoscopic repair was done under General anaesthesia and open repair under Spinal anaesthesia. In cases of bilateral hernia, both sides were operated simultaneously as it obviates the need for a second anaesthesia and surgery, decreased psychological stress and financial savings.

1) Duration of Surgery:

The duration for surgery was significantly longer in the laparoscopic group around 34.96 mins in unilateral repair and 46.30 mins in Bilateral inguinal hernia repair.



2) Intra-operative complications:

COMPLICATION	OPEN		LAPAROSCOPIC		TOTAL	
	Freq. (n=50)	Perc. (100%)	Freq. (n=50)	Perc. (100%)	Freq. (n=100)	Perc. (100%)
Bleeding	0	0.0	1	2.0	1	1.0
Peritoneal tear	-	-	5	10.0	5	5.0
Bladder injury	-	-	0	0.0	0	0.0
Vas deferens injury	0	0.0	0	0.0	0	0.0
Bowel injury	-	-	0	0.0	0	0.0
TOTAL	0	0.0	6	12.0	6	6.0

Intra-operative complications were seen in 6 cases (12 %) of Laparoscopic inguinal hernia repair as compared to none in open inguinal hernia repair. Peritoneal tear being the most common intra-op complication in around 5 cases which may be due to learning curve in case of Laparoscopic (TEP) inguinal hernia repair.

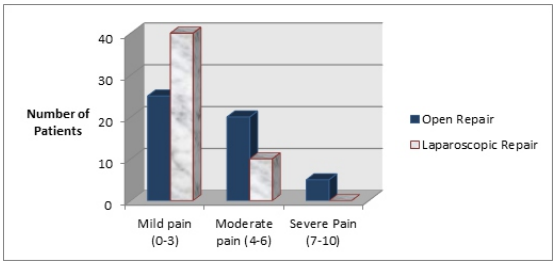
3) Post-operative complications:

COMPLICATION	OPEN		LAPAROSCOPIC		TOTAL	
	Freq. (n=50)	Perc. (100%)	Freq. (n=50)	Perc. (100%)	Freq. (n=100)	Perc. (100%)
Hematoma	1	2.0	1	2.0	2	2.0
Seroma	2	4.0	0	0.0	2	2.0
Wound infection	2	4.0	0	0.0	2	2.0
TOTAL	5	10.0	1	2.0	6	6.0

Post-operative complications were seen in 5 cases (10 %) of open inguinal hernia repair as compared to 1 case (2 %) in Laparoscopic inguinal hernia repair may be due to big incision of open hernia repair as compared to that of Laparoscopic inguinal hernia repair.

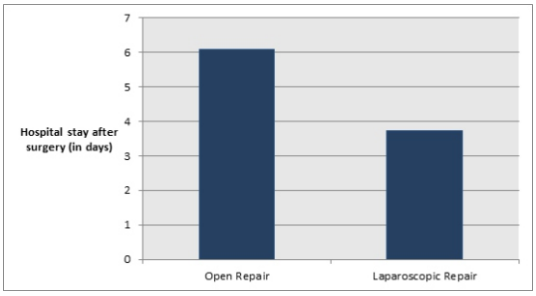
In total, 5 cases developed complications in open surgery as compared to 7 cases in laparoscopic inguinal hernia repair.

4) Post-operative Pain:



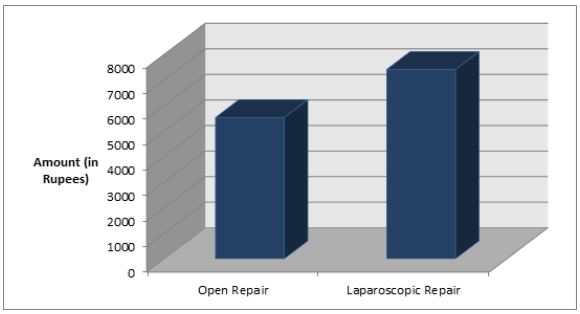
Pain was assessed using verbal pain rating scale. Severe pain was complained in 5 cases of open surgery as compared to none in laparoscopic inguinal hernia repair. 40 cases of laparoscopic inguinal hernia repair had mild pain post-operatively, as compared to 25 cases in open surgery. Rest of the cases was of Moderate pain.

5) Duration of Hospital stay:



The mean duration of hospital stay was found to be 6.1 days for open inguinal hernia repair compared to laparoscopic repair which was around 3.74 days.

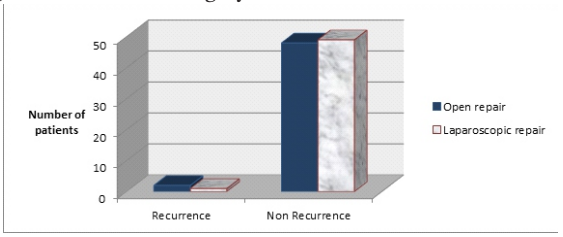
6) Cost of Hospitalization:



The mean cost of surgery was around 5524 INR for open repair as compared to 7406 INR in Laparoscopic repair group.

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7) Recurrence after Surgery:



Recurrence of the inguinal hernia was seen as patient was been on regular follow up for around 6 months. In case of open repair around 2 cases came with the complaints of recurrence as compared to 1 case in Laparoscopic repair of inguinal hernia.

DISCUSSION:

This study compared two tension-free, mesh-based hernia-repair techniques: Group (A) Laparoscopic (TEP /TAPP) inguinal hernia repair and Group (B) Open Lichtenstein inguinal hernia repair. Intra-operative complications were more in case of laparoscopic (TEP /TAPP) inguinal hernia repair (peritoneal tear being the most common complication in TEP) and postoperative complications were more frequent in the open Lichtenstein inguinal hernia repair. These results are consistent with others studies which have reported that patients who underwent laparoscopic repair returned to their usual activities one day sooner than those who underwent an open repair. Laparoscopic repair compared favourably with Lichtenstein repair for primary indirect and direct hernias, bilateral recurrent hernias (16).

Advantages of Laparoscopic (TEP /TAPP) Repair:

The laparoscopic operations caused significantly less pain in the early post-operative period, leading to earlier mobilization and earlier return to work than open mesh repair. Furthermore, laparoscopic repair is associated with greater patient satisfaction and better cosmetic results than its open counterpart. On the basis of these early experiences, laparoscopic hernia repair seems to be as good as, if not superior to, the existing open Lichtenstein repair in terms of less hospital stay, return to work, and cosmesis provided the long-term recurrence rates also are comparable.

It is possible to achieve high standards even during the learning phase of the surgeon if there is strict adherence to the protocols (17). The TEP technique took no longer to perform and was associated with a shorter period of sick leave and a faster recovery, compared with open Lichtenstein hernia repair. At present, the laparoscopic repair of hernia finds its clinical niche in patients with bilateral or recurrent hernias or in patients with unilateral hernia who desire a minimal period of postoperative disability (18).

Open hernia repair requires an incision at the point of maximum weakness, dividing of muscle and then suturing to repair the defect. This damage must heal before the wound become comfortable. Type of anaesthetic used to affect the repair does not affect the period of discomfort. In a laparoscopic repair no incision is made in the groin. The small wounds which are made heal rapidly and have been shown to cause negligible postoperative pain. Further mesh is placed inside the groin muscle in the pre-peritoneal layer and this seems a more logical position to prevent peritoneal contents bulging out of a muscle defect than placing a mesh on the outside of the defect. Laparoscopic repair has no surgical weakness postoperatively.

Advantages of Open Hernioplasty:

Laparoscopic hernia repair is relatively costly; difficult to learn with a steep learning curve, carries the risk of serious visceral and or vascular injuries. All cases of groin hernia are not suitable for laparoscopic hernia repair as it is contraindicated in strangulated hernia, sliding hernia, irreducible hernia and patients who are elderly or have co-morbid conditions.

Laparoscopic hernia repair cannot be performed as day care surgery or under local anaesthesia. Open mesh repair is economical, easy to teach and learn without any steep learning curve. Open hernia repair does not need any specialized training and results are same in both specialist and non-specialist centre.

Open hernia repair does not carry any risk of serious visceral or bowel injuries. Open mesh repair is suitable for all types of groin hernias including strangulated, irreducible, sliding hernia or in elderly patients and patients with co-morbidity (19).

CONCLUSION:

We conclude that Laparoscopic (TEP /TAPP) hernia repair is safe and provide less post-operative morbidity in experienced hands and definitely has many advantages over open Lichtenstein inguinal hernia repair like less post-operative pain and complications, less duration of hospitalization leading to earlier discharge and return to daily activities, better cosmetic results. Although some of the disadvantages found were increase in the total cost of surgery and better learning curve which can be overcome by earlier return to work and daily activities along with improvement in minimal invasive surgery respectively.

REFERENCES:

1. Qureshi MA, Sajjad J, Hashmi. Short-term outcome after polypropylene darn and Lichtenstein's hernioplasty: A randomized prospective study. Pak Armed Forces Med J. 2004;54:11-32.
2. Amid PK. Lichtenstein tension free hernioplasty for the repair of primary and recurrent inguinal hernias. Nyhas & Condon's Hernia. 5th ed. Philadelphia: Lippincott Williams & Wilkins. 2002 149-57.
3. Wijsmuller AR, Lange JFM, Kleinrensink GJ, van Geldereetc D. Nerveidentifying inguinal hernia repair: A surgical anatomical study. World J Surg. 2007;31:414-20.
4. Aurangzeb M. Tension -free mesh hernioplasty; a review of 96 cases. J Postgrad Med Ins. 2004; 18:46-51.
5. Gould J. Laparoscopic verses open inguinal hernia repair. Surg Clin N Am. 2008; 88:1073-81.
6. Fegade S. Laparoscopic versus open repair of inguinal hernia. World J Lapar Surg. 2008;1:41-8.
7. Bhattacharjee PK. Surgical option in inguinal hernia: which is best. Indian J Surg. 2006; 68:191-200.
8. Hallén M, Bergenfelz A, Westerdahl J. Laparoscopic extraperitoneal inguinal hernia repair versus open mesh repair: long-term follow-up of a randomized controlled trial. Surgery. 2008; 143: 313-317.
9. The MRC Laparoscopic Groin Hernia Trial Group. Laparoscopic versus open repair of groin hernia: a randomised comparison. Lancet. 1999; 354: 185–190.
10. Vidovi D, Kirac I, Glavan E, Filipovi -Cugura J, Ledinsky M, BekavacBeslin M. Laparoscopic totally extraperitoneal hernia repair versus open Lichtenstein hernia repair: results and complications. J Laparoendosc Adv Surg Tech A. 2007; 17: 585–590.
11. Phillips EH, et al. Incidence of complications following laparoscopic hernioplasty. Surg Endosc 1995; 9(1): 16-21.
12. Becker N, et al. Pain epidemiology and health related quality of life in chronic nonmalignant pain patients referred to a Danish multidisciplinary pain center. Pain 1997; 73: 393-400.
13. Liem MS, et al. Comparison of conventional anterior surgery and laparoscopic surgery for inguinal-hernia repair. N Engl J Med 1997; 336(22):1541-7.
14. Douek M, Smith G, Oshowo A, Stoker DL, Wellwood JM. Prospective randomised controlled trial of laparoscopic versus open inguinal hernia mesh repair: five year follow up. Br Med J. 2003; 326:1012-3.
15. Mishra RK. Complications of Laparoscopic Surgery. Current Medical Journal of India 2004; 10(3) June.
16. Kukleta Jan F Klinik Im Park, Zurich. Causes of recurrence in laparoscopic inguinal hernia repair. Switzerland. J MAS 2006; 2(3): 187-91.
17. Onofrio L, Cafaro D, Manzo F, Cristiano SF, Sgromo B, Ussia G. Minerva Chir 2004; 59(4): 36977.
18. Eklund A, Rudberg C, Smedberg S, Enander LK, Leijonmarck CE, Osterberg J, Montgomery A. Br J Surg 2006; 93(9): 1060-8.
19. Gainant A. J Chir (Paris). 2003; 140 (3): 171-5.