



**Full Length Research Article**

**COMPARATIVE STUDY OF LAPAROSCOPIC TEP OVER STOPPA'S AND LICHTENSTEIN TECHNIQUE FOR THE MANAGEMENT OF BILATERAL INGUINAL HERNIA- A PROSPECTIVE STUDY**

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**ABSTRACT**

**Background:** This study was aimed to evaluate the superiority of Laparoscopic totally extraperitoneal patch (TEP) repair over open stoppa's and Lichenstein tension free repair for bilateral inguinal hernia.

**Material and Methods:** Total 80 patients of bilateral inguinal hernia was taken in present study. They were divided in three groups by closed envelope method. Total 27 patients in Laparoscopic TEP group, 28 in open Stoppa's group & 25 in open Lichenstine group. Duration of surgery, Post-operative pain, hospital stay, intra & post operative complications and recurrence were recorded.

**Results:** The duration of surgery was the least in the Laparoscopic TEP group (40 min) as compared to Open Stoppa's repair (42min) & open Lichtenstein group (50min). Minimal complications were noted in Laparoscopic TEP group (one incidence of balloon rupture) as compared to the stoppa's & open inguinal hernioplasty (post operative seroma, scrotal edema, urinary retention & wound infection). Major intra-operative complications were not seen in either of the 3 groups. Recurrence was not seen with the open Lichtenstein approach, which was seen in 1 patient of the laparoscopic repair group & 2 of the stoppas repair group; both of which were managed by the open Lichtenstein. Post operative pain as measured with the VAS was the least with the laparoscopic group. Patients who underwent laparoscopic repair were discharged earlier than the other two groups.

**Conclusion:** Laparoscopic TEP is a safe & offer less postoperative pain in treatment of bilateral hernias as compared to open Stoppa's & open Lichtenstein hernia repair, as well as Post-operative hospital stay is decreased, with earlier return to routine activities.

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**INTRODUCTION**

The choice of surgery for bilateral inguinal hernia repair is still remain the debatable question for all surgeons (Van.Hee, 2011; Milic and Pejic, 2003). The hernia surgery has gone through a major evolution from the days of truss & castration to the present day of laparoscopic extra peritoneal surgery. The main reasons for intervention have remained the same continuous growth of inguinal or scrotal swelling, risk of incarceration & bad results of conservative methods (Van.Hee, 2011). From Bassini's heralding of the modern era to today's mesh-based open and laparoscopic repairs, this history parallels closely the evolution in anatomical understanding, development of the techniques of general surgery & progress in

technology. However the issue remains; whether the wide array of surgical procedures can or should be whittled down to a few "standard" operations that are safe, effective, and cost-efficient. The most important advance in hernia surgery has been the development of tension-free repairs. In 1958, Usher described a hernia repair using Marlex mesh. The benefit of that repair he described as being "tension-eliminating" or what we now call "tension-free". In Lichtenstein onlay mesh plasty, the mesh is sutured from the transversus arch to the shelving edge of the inguinal ligament creating a "tension-free" repair (Milic and Pejic, 2003). Although open, mesh-based, tension-free repair remains the criterion standard, laparoscopic hernia repair, in the hands of adequately trained surgeons, produces excellent results comparable to those of open repair. In a comparison of open repair with laparoscopic (totally extraperitoneal patch) repair, Eklund et al. (2010) found that 5 years postoperatively, 1.9% of patients who had undergone

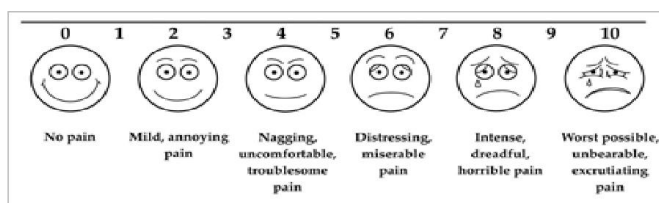
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laparoscopic repair continued to report moderate or severe pain compared with 3.5% of those in the open repair group. Stoppa and colleagues used the posterior approach to implant an impermeable barrier around the entire peritoneal bag, demonstrating that permanent repair of groin hernias does not require closure of the abdominal wall defect. Present study was conducted to compare a laparoscopic TEP with open technique (Lichtenstein) & open stoppa's repair for bilateral inguinal hernia repair regarding post-operative pain, duration of hospital stay, Complications & duration of surgery.

## MATERIALS AND METHODS

An observational prospective study of 80 patients of bilateral uncomplicated inguinal hernia was conducted in Sir Sayajirao General Hospital, Baroda, India over a period of two & half year from May 2009 to November 2011. All the patients were examined clinically and their history and examination findings were filled in the proforma. Patients with obstructed or strangulated inguinal hernia, not fit for general anaesthesia, with recurrent inguinal hernias or with previous hypogastric surgery were excluded from this study. Patients were randomized with closed envelop method in three group. Total All patients under went routine investigations like Hemoglobin estimation, Serum bilirubin, blood urea, serum creatinine, Xray chest, USG prostate & PRV. In laparoscopic TEP group, preperitoneal space was entered just below the umbilicus and enlarged using gentle blunt dissection with a laparoscope. Two 5-mm ports were placed in the midline under direct vision, and reusable cannulas and instruments were used. After the hernia sac was reduced, a 15x10cm polypropylene mesh was used to cover the myopectineal orifice in all patients and was fixed to the pectineal ligament and further laterally using tacks. In open stoppa's group, pre-peritoneal and prevesical space was entered through 8-10cm lower midline abdominal wall incision. The hernia sacs were treated separately according to the degree of adhesion to the neck of the myopectineal orifice. Two 15X7.5 cm polypropylene chevron shaped mesh are spread on either side. The mesh was fixed to the cooper's ligament with a single stitch with prolene. Open Lichtenstein repair were done with use of 11 X 6 cm polypropylene mesh. Duration of surgery, Post-operative pain, duration of hospital stay, any Complications were recorded. Post-operative pain was measured on VAS (visual analogue scale (1-10)) on post-operative day1, 3, 7 & 10. The VAS Score was analysed 8 hrly & the average of them was taken for analysis.

### VAS (visual analogue scale)



All patients were given one day of prophylactic injectable antibiotic Amoxicillin Clavulanate followed by oral antibiotics for 7 days. Post operatively, analgesic was given 'on demand' basis in the form of Tablet Diclofenac. Patients were discharged on the second day if there is no urinary retention, nausea or vomiting, wound complications and pain is well controlled. After that they were followed at one month &

further follow up was done with telephonic questionnaires about pain at operative site, any discomfort, wound complication & recurrence. Statistical Analysis: All statistical analyses were performed by 't' test & chi square test as and when required with the help of SPSS 18.0 for Windows & Med-cal software.

## RESULTS

Total 80 patients of bilateral inguinal hernia in whom Laparoscopic TEP (27), open Stoppa's hernia repair (28) & open Lichtenstein hernioplasty (25) was performed in the department of General Surgery at the Sir Sayajirao General Hospital & Medical College Baroda from May 2009 to Nov 2011, were included in present study. Of these 80 patients intraoperatively bilateral direct hernia was found in 55 patients, 20 patients had bilateral indirect hernias & 5 patients had both the components. The age was ranging from 22 to 85 years. The mean age of patients in open inguinal group is 52.84 years; in stoppa's repair group is 54.53years and in laparoscopy group in 53.78 years. Average duration for Laparoscopic TEP was approximately 40min, 42min for open Stoppa's repair & 50min for Open Lichtenstein hernioplasty. The duration of surgery was less in the Laparoscopic TEP & Open Stoppa's repair group as compared to Open Lichtenstein hernioplasty group with significant 'p' value ('p' value <0.05) whereas it was not significantly between the Laparoscopic TEP & open Stoppa's repair group ('p' value >0.05). In the present study, there were no major intra-operative complications like bowel or bladder injury or peritoneal tear or damage to inferior epigastric vessels in either of the groups. Intra operative balloon rupture was seen in one patient in the Laparoscopic TEP group. Scrotal edema was seen in 2 patients of the Open Lichtenstein repair group & 1 patient of Open Stoppa's repair group which was treated conservatively with scrotal elevation & anti-inflammatory drugs.

Wound infection were encountered in 1 patient each of the open inguinal repair & stoppa's repair group which was managed conservatively with appropriate anti biotic according to culture & sensitivity. One patient of the stoppa's repair group & 2 of the open inguinal repair group had post-operative seroma formation which was aspirated with sterile precautions. Recurrence was seen in one patient in the Laparoscopic TEP group & 2 patients of the Open Stoppa's repair group. In the laparoscopic repair group, the recurrence occurred 12 months after surgery & was unilateral, which was treated with open inguinal hernioplasty. In the Open Stoppa's repair group, one was a unilateral recurrence at 15months after surgery, the other was bilateral which occurred 15days after surgery, both were dealt by Open Lichtenstein hernioplasty. By using the Unpaired T-test, the VAS score on day 1 was much lower in the Laparoscopic TEP group as compared to both the Open Lichtenstein hernioplasty & Open Stoppa's repair group ('p' value <0.05) whereas it was not significant when comparing the Open Lichtenstein hernioplasty & Open Stoppa's group ('p' value >0.05). The VAS score on Day3 was much lower in the Laparoscopic TEP group as compared to both other groups ('p' value <0.05) & it was not significant between Open Lichtenstein hernioplasty & Open Stoppa's repair group ('p' value >0.05). The VAS score on Day7 was much lower in the Laparoscopic TEP group as compared to both the other groups ('p' value <0.05) whereas it was not significant when comparing between Open Lichtenstein

**Table 1. Average Visual Analogue Score (VAS) for day 1,3,7,& 10**

	VAS Day 1	VAS Day 3	VAS Day 7	VAS Day 10	Total no of patients
TEP	2.73	1.85	1.81	0.63	27
OPEN INGUINAL	6.28	4.24	2.8	1.4	25
STOPPA'S	6.25	4.32	3.3	1.3	28

hernioplasty & Open Stoppa's repair group ('p' value >0.05) The VAS score on Day10 was much lower in the Laparoscopic TEP group as compared to both other groups ('p' value <0.05) whereas it was not significant when comparing Open Lichenstine hernioplasty & Open Stoppa's repair group ('p' value >0.05) The patients undergoing laparoscopic repair were discharged much earlier (85% were discharged on day2 and the rest on day3) as compared to the open inguinal in which 80% discharge after day 2 & in open stoppa's repair group 82% were discharge after day 2.

## DISCUSSION

In a recent analysis of the cost effectiveness<sup>4</sup> of laparoscopic surgery for Bilateral hernias the Health Services Research and Health Economics Research Unit of the University of Aberdeen concluded that it was likely that laparoscopic repair was more cost effective than open mesh repair for the management of symptomatic bilateral hernias. This was because differences in operating time are reduced and differences in convalescence are more marked in favour of the laparoscopic approach. One of the major advantages of laparoscopic hernia repair is that it offers a minimal access approach to pre-peritoneal hernia repair. This makes it the experienced laparoscopic surgeon's operation of choice for repair of recurrent groin hernias. Laparoscopic TEP hernia repair is a new alternative to conventional treatment for bilateral hernia and has several advantages like reduction of postoperative pain, mesh placement in the pre-peritoneal space where the hernia is produced (myopectineal orifice), bilateral repair by a single access and the possibility that unexpected opposite hernia can be repaired simultaneously, easier repair of recurrent hernia as the repair is performed in tissue that has not been previously dissected, the highest possible ligation of hernial sac, less tissue dissection and disruption of tissue planes, three ports are adequate for all type of hernia, Improved Cosmesis, Low rate of intra-operatively and postoperative complications.

Recurrences in TEP are due mainly to technical mistakes and therefore occur early, while in the Lichtenstein approach, recurrences appear later and usually involve large direct hernias. The main causes of recurrences after laparoscopic repair are incomplete dissection, missed hernia, overly small mesh size, and inadequate position or migration when the mesh is not fixed<sup>3</sup>. There are drawbacks to laparoscopic hernia repair, the most serious of which is the long learning curve. This is compounded by the fact that the average surgeon only repairs around 50 inguinal hernias per year. A further serious drawback of laparoscopic hernia repair is the rare but serious occurrence of vascular and visceral injury. The cost differences can be reduced by using reusable rather than disposable equipment and with increasing experience time should become as least at fast as that for open repair. In present study average duration of surgery was 40min for Laparoscopic TEP which is less as compared to Singh *et al.*

(2009), in which it was 120min. The overall complication rate of TEP present study was 7%. The only intraoperative complication seen was one episode of balloon rupture (3%) during creation of pre peritoneal space. Post-operative complications have been reported by Sinha *et al.* (2006) (hematoma-3.3%, infection -1%, retention 2-10.9%) which were not seen in present study. Neumayer *et al.* (2004) reported retention of urine in 2.8%, hematoma/seroma formation in 16.4%, and infection in 1% cases. Singh *et al.* (2009) reported retention in 2.8%, hematoma/seroma in 16.4% & wound infection in 1% cases. The recurrence rate in present study was 3% which is less as compared to most of the other studies. (Singh *et al.* (2009) 6.7%, Neumayer L *et al.* (2004) 10.1%, Sinha *et al.* (2006) 3.33%), Mc Corman *et al.* (2003) 2.7%). All studies reported reduced morbidity with this approach in terms of pain with earlier return to routine activities & shorter duration of hospital stay except the study conducted by Sinha *et al.* (2006) which had a greater duration of hospital stay in the laparoscopic group as compared to the open inguinal approach. (laparoscopic-3.5days & open-1.8 days) Open Stoppa's repair took average of 42 min in present study which is more as compared to the study conducted by Sinha R *et al.* (2006) (32min) but less than the study conducted by Melangirt *et al.* (2000) (51min).

There were no intra operative complications in present study, whereas post-operative complications were seen in 4 patients (14%). Recurrence was seen in 2 patients (7%) in present study which is greater than study of Neumayer *et al.* (2004) (0.9%), Sinha *et al.* (2006) (1.67%), Melangirt *et al.* (2000) (4.5%). Open Lichenstine tension free inguinal approach took average 50 min for bilateral repair in present study which is less as compared to the study of Tanhiphat *et al.* 1067 min, Singh *et al.* (2009) 75min, Melangirt *et al.* (2000) 65min. There were no intra operative complications in the present study. Incidence of minor post-operative complications like scrotal edema & seroma formation was 16% in present study which was high in conducted by Fagade *et al.* (2008) up to 25% & Melangirt *et al.* (2000) (26%), but greater than the study of Muldoon RL5 in which scrotal hematoma was 4% & wound hematoma was 2.6%. in the study of Neumayer *et al.* (2004) & Singh *et al.* (2009) reported incidence of wound hematoma/seroma was up to 13.6%. In present study there was no recurrence in the open lichenstine tension free inguinal approach group which was comparable with study of Melangirt *et al.* (2000), which has been reported 4.3% by Muldoon RL5, 4.9% by Neumayer *et al.* (2004) & 1.67% by Singh *et al.* (2009).

## Conclusion

Laparoscopic TEP is a safe & offer less postoperative pain in treatment of bilateral hernias as compared to open Stoppa's & open Lichenstine hernia repair, as well as Post-operative hospital stay is decreased, with earlier return to routine activities. There are less probability for complications like

seroma formation, wound infection, scrotal edema & urinary retention in the laparoscopic TEP repair. As the high technical skill is required to perform Laparoscopic TEP and Open Stoppa's repair, High recurrence rate with this method as compare to open Lichtenstein hernia repair is still remain the topic for discussion. Although there is a very long learning curve for Laparoscopic TEP, but still it is a preferred technique for the management of bilateral inguinal hernia repair by an experience Hand.

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