Research Article

Laparoscopic mesh versus open mesh repair of inguinal hernia a comparative study

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Abstract

Objective: To compare tension-free open mesh hernioplasty with total extra-peritoneal (TEP) laparoscopic hernia repair. Design: A prospective comparative study of 60 patients with inguinal hernias. **Results:** The laparoscopic method took significantly more time than the open procedure ($p < 0.01$). No Intra-operative complications in both groups, postoperative complications were more frequent in the laparoscopic group, although rates of long-term complications were similar in the two groups. Duration of hospital stay ($p < 0.01$) was significantly higher after laparoscopic repair. Pain scores at 6 hours, 12 hours and 24 hours showed significantly less pain for the laparoscopic group ($p < 0.01$).Return to work was early in laparoscopic group. The mean cost per patient for laparoscopic repair was higher. Conclusion: Laparoscopic technique is safe option for inguinal hernia repair, it is superior to open technique in respect to post operative pain and early return to work, complication rates are same in both technique but laparoscopic method is less cost effective.

Keywords: Inguinal hernia, laparoscopy.

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INTRODUCTION

Inguinal hernia repair in adults is one of the commonest surgical procedures performed worldwide. Since the original description of hernia repair by Bassini in 1889[1], hernia surgery underwent numerous refinements with the sole idea to reduce recurrence. Hernia repair using suture has paved the way to synthetic meshes to cover the myopectineal orifice. Lichtensteins tension-free mesh placement reduced recurrence rates to less than 1%[2]. Preperitoneal placement of mesh as advocated by Cheatle in 1921 and later approved by Stoppa was further explored by Ger in 1982 by laparoscopic approach. Since the advent and wide-spread application of laparoscopy to various surgical procedures, inguinal hernia surgery received a new dimensional approach claiming equivalent or even better results than the available methodologies [3,4]. The increased cost of laparoscopy was obviated by other factors like less morbidity and earlier return to work. Laparoscopic inguinal hernia repair has been tested in a number of trials but with conflicting results[5,6,7]. Moreover, most of these trials are from the western world, which does not reflect the true picture from developing countries. The present study was designed to evaluate the effectiveness of the laparoscopic procedure compared with open mesh technique for treatment of inguinal hernia in a developing country.

MATERIALS AND METHODS

This comparative prospective study included patients treated for inguinal hernia by laparoscopic TEP (total extra-peritoneal) and open tension-free hernioplasty under the care of one surgeon. Approval from the hospital's ethics committee had been obtained. Patients were excluded if they were medically unfit for general anesthesia, had a previous lower midline or paramedian incision, had an acute or irreducible inguinoscrotal hernia, had an uncorrected coagulation disorder, or were pregnant. The surgeon had performed 50 TEPs before beginning of the study. Selection of patients for a particular procedure (laparoscopic or open) was done as

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per patients' wishes after proper explanation about the operative procedure. Those patients who opted for laparoscopic procedure were further screened for fitness to undergo laparoscopic surgery. Patients opting for laparoscopy but unfit for surgery were excluded from the study. Patients with inguinal hernia who opted for open surgery underwent Lichtenstein tension-free hernioplasty. Patients opting for laparoscopic repair underwent a totally extraperitoneal laparoscopic repair. The 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.

Figure 1:

All patients were followed up at the outpatient clinic weekly for three months and annually thereafter. Patients who failed to keep their clinic appointment were given the option to return to the clinic at earliest occurrence of any discomfort. Those, who did not comply with this and did not attend outpatient clinic for a period of more than two years, were noted as cured without recurrence. This comparative prospective study included 60 patients. 30 patients underwent an open procedure (Lichtenstein tension-free mesh hernioplasty) whereas 30 patients underwent laparoscopic total extraperitoneal mesh hernioplasty (TEP).

OBSERVATION AND RESULTS

Table 1: Characteristic

Characteristics	Open N-30	Laparoscopic N-30
age (yrs)	45	41
Sex (%)		
male	29	27
female	01	03
Hernia (%)		
unilateral	30	23
bilateral	00	07
primary	29	22
recurrent	01	08
Co existing conditions		
hypertension	09	05
COPD	01	00
Chronic cough	05	03
Prostatism	05	06
Diabetes	04	05
Smoking	10	09
Alchohol	04	03
Operative time in min	60	49
Pain at 6 hrs	8.1	7.0
Pain at 12 hrs	5.9	4.6
Pain at 24 hrs	2.7	2.3
Complications		
Intra operative	Nil	Nil
Postoperative		
Hematoma	01	04
Cord edema	07	00
Surgical emphysema	00	05
Urinary retention	05	06
Requiring catheterization		
Infection	**03**	**02**

Table 2:

Duration of hospital stay	3 Days	4 Days
Chronic pain	00	00
Recurrence	00	00
Average cost in rupees	**15500**	**30000**

higher levels of Malondialdehyde and protein bound sialic acid in diabetes with and without retinopathy patients. The estimation of these parameters may serve as a tool in the early diagnosis and treatment for diabetic patients, prior to the development of retinopathy complication. However in order to reach a definitive conclusion, further studies are conducted with large sample size.

DISCUSSION

Laparoscopic cholecystectomy has withstood the test of time and accepted as the gold standard for patients with gall stone disease[8]. But unfortunately, laparoscopic hernia surgery attempting similar claims underwent controversies with conflicting results[9]. This was primarily because the question of what is to be compared was difficult to know. This was proved by the fact of a published data involving recurrent hernia surgery where recurrence was claimed to be 17 %[10]. It has been claimed that the Shouldice method should be the gold standard when evaluating other methods of hernia repair[11]. We chose to ignore this fact, as Lichtenstein repair of inguinal hernia is a time-tested option, mimics clinical reality and is associated with the lowest rate of recurrence among the various methods for open repair of inguinal hernia with results equally reproducible from all quarters of the globe. The other point of carrying out this study was that limited indexed Indian literature[12] on the subject was available though laparoscopic hernia surgery was rampantly

preached and practiced. The few data available were from specialized centers compared to general Indian population where the scenario is totally different as far as social and economic factors are concerned. Our study revealed the fact that the so-proclaimed morbid factors like hypertension, obstructive airway diseases which contraindicated laparoscopic surgery played a minimal role[13]. With the availability of safe and effective general anesthetic agents and better postoperative care, laparoscopic hernioplasty could be performed without complications. In our study total operating time was found to be longer for the laparoscopic group. Open technique is usually first surgical procedure a surgeon performs in residency and in open hernia repair anatomy is same which is learned at anatomy dissection table so surgeon feels ease in open repair. In laparoscopic surgery, surgeon has to get well versed with instruments and skill of handling laparoscopic instruments and laparoscopic anatomy which is different hence surgeon takes more time to get versed with laparoscopy. this is called as learning curve. As in later part of study coordination between surgeon and camera assistant develops and operative time decreases. Unnecessary hurry could lead to perforation of the peritoneum leading to conversion as has been reported[14]. The other danger is that of injury to vessels and cord structures leading to collection, thus decreasing the small potential space further, making surgery difficult as anatomy becomes. Pain felt by laparoscopic group as compare to open group at 6 hrs, 12hrs and 24 hrs was less and statically significant. So as recovery was better in laparoscopic group. Laparoscopic surgeries causes significantly less pain in post operative period hence earlier mobilization and earlier return to work, greater patient satisfaction and better cosmetic results. In our study there were no intra operative complications. in postoperative period 5 patients have local hematoma more in laparoscopy group, which was managed by simple aspiration. Incidence of cord edema was more in open group. Surgical emphysema was seen in some patients after laparoscopy, which required no major incidence and was subsided within few hours. Incidence of urinary retention was comparable in both groups, more in patients having symptoms of prostatism previously. Minor wound infections in 2patients was reported in both groups requiring oral antibiotics. Recurrence was not reported in both group. A longer duration of hospital stay after laparoscopic surgery was noted in our study compared to the open surgery. Several reasons were attributable. Firstly, as this study was the first of such a kind in our setup we were a bit skeptical about early discharge of patients undergoing laparoscopic repair. This was further compounded by some early complications including hematoma and surgical emphysema in the initial part of our study. During the concluding phases we were confident enough and the later group of patients was discharged early. The greatest hindrance to laparoscopic surgery in our setup was the added cost. This has been the focus of all the published reports[15]. This is more so in our country as the socioeconomic status of our population is below par. Of late, with the availability of different health insurance policies, there has been some improvement but further time is required to bring about an overall change.

SUMMARY AND CONCLUSION

1. Laparoscopic hernia repair is safe and viable option for repair of inguinal hernia.
2. Laparoscopic hernia repair is superior to open hernia repair in respect to post operative pain, ambulation and early return to work.
3. Laparoscopic hernia repair is safe with complication rate same as open hernia repair, if perform by experienced person.
4. Complications in laparoscopic hernia repair can be minimized by following strict operative protocols.
5. Laparoscopic hernia repair is associated with steep learning curve for surgeons.
6. Laparoscopic hernia repair takes longer operative time than open mesh repair, operative time in laparoscopy hernia repair decreases as surgeon gains more experience.
7. laparoscopic hernia repair is more expensive than open hernia repair both to patients and health care system. cost of laparoscopic repair can be reduce by using innovative techniques, like using reusable trochars, using scope for creating preperitoneal space rather than using balloons, not using fixation devices.

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