Inguinal Hernioplasty Open or Laproscopic?

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Abstract: Inguinal mesh hernioplasty is one of the common procedure performed throughout the world. The laparoscopic approach to inguinal hernioplasty is now well established. The laparoscopic approach offers advantages in terms of lesser postoperative pain and analgesic requirements as well as a significantly early return to work. The incidence of chronic debilitating pain is also significantly lower than with open mesh repair. It offers the advantage of examining the opposite side for the presence of a small hernia sac. In cases of recurrent hernia, following previous open mesh repair, the laparoscopic approach allows access to the hernial site without going through scarred tissues or mesh. The laparoscopic procedure however requires significantly longer operating time at least in unilateral cases. However, the operating time in bilateral cases are not significantly different. The laparoscopic procedure also has a long learning curve and surgeons with greater experience with the procedure are able to have shorter operating times as well as fewer complications.

INTRODUCTION

Hernia is derived from the Latin word for rupture.[3] A hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. Although a hernia can occur at various sites of the body, these defects most commonly involve the abdominal wall, particularly the inguinal region. Accounting for 75% of all abdominal wall hernias, and with a lifetime risk of 27% in men and 3% in women, inguinal hernia repair is one of the most commonly performed surgery in the world.[4] Repair of inguinal hernia is one of the commonest surgical procedure worldwide, irrespective of country, race or socioeconomic status, hernia constitutes a major healthcare drain. In our institute which is tertiary care under graduate and post graduate teaching facility the procedure was introduced in 2006. All surgical units do not offer laparoscopic hernioplasty to their patients. Among those that do there is varying level of interest in the procedure among the faculty that make up the unit. The most recent paradigm shift to affect general surgery has been the adoption of laparoscopic surgery. Nearly every abdominal procedure that was commonly performed using a long incision has been supplanted with a laparoscopic variation. As with the introduction of any new technology, debates have ensued challenging the benefits of laparoscopic vs. open surgery.

In regard to laparoscopic inguinal hernia repair, the controversy has endured. Despite of numerous data attesting to the success of laparoscopic inguinal hernia repair, general surgeons continue to question the most appropriate approach to primary unilateral inguinal hernia. Purpose of this study is to determine how the laparoscopic inguinal hernioplasty fares against conventional open repair in the treatment of inguinal hernia at our centre considering the wide range of technical skill.

AIMS AND OBJECTIVES

To compare laparoscopic and open inguinal hernioplasty in tertiary centre with regards to
- Duration of surgery.
- Degree of postoperative pain.
- Incidence of wound infection.
- Duration of hospital stay.
- Duration to resume normal activity of daily living.
- Recurrence rates at 6 months following surgery.
- Complications

While the results of such a comparison are well documented in the literature, the present study attempts to examine whether the same results are produced in our institution, given that operations are performed by surgeons with varying levels of interests and expertise in the procedure and also by residents in training, under supervision.

MATERIALS AND METHODS

The study was conducted over a period of 2 years from August 2009 to August 2011. All the patient who underwent laparoscopic operation for inguinal
hernia during this period were taken as subjects for the study. To create necessary basis for comparison, an equal number of patients undergoing open hernioplasty were also chosen serially. Thus it was possible to analyze a total of 50 hernioplasties, 25 LHs and 25 OHS. Patients who had irreducible, obstructed, strangulated inguinal hernia were excluded from study.

Data obtained over a period of 24 months from August 2009 to July 2011, of 25 patients who had undergone laparoscopic hernioplasty was analyzed by chart analysis. Comparison was made with 25 patients who had undergone open inguinal hernioplasty. On admission a detailed history was taken and thorough clinical examination of all patients was carried out as shown in Performa.

All patients undergoing laparoscopic procedure were operated under general anesthesia and those undergoing open surgery under spinal anesthesia. A single dose of antibiotic was administered as prophylaxis at the time of induction of anesthesia.

All laparoscopic procedure were performed by ‘total extaperitoneal method’ of hernioplasty, and all open procedure by ‘lichtenstein tension free open mesh repair’.

Intraoperatively careful note was made of:

- Time taken for procedure. Operative time was calculated from the time of incision to the time closure.
- Documentation of any complications encountered during the procedure.
- If laparoscopic procedure was converted to open, then reasons for conversion.

From the first postoperative day all patients were given oral analgesic using ibuprofen plus paracetamol combination. Patients were asked to take analgesic as required and note was made of number of doses and severity of pain experienced prior to dosing. A note was made using the visual analogue scale (VAS) of severity of pain. This was done three times a day for three postoperative days prior to dosing. Patients were admitted for three days for accurate evaluation and documentation of the severity of pain. This was found necessary since most patients were not sure of keeping an accurate record on their own. Therefore a comparison of days of hospital admission could not be made. Patients were discharged on post operative day four. Patients were advised to continue analgesic use as per requirement. They were scheduled for visits in the outpatient at 7 ± 2 days, 8 ± 1 weeks, and 6 ± 1 months after surgery.

Postoperative pain was assessed by measuring duration of analgesic use and subjectively using a VAS and at 1 week postoperatively. The score selected by the patient was plotted against the postoperative day for each patient.

The testes, scrotum and operative wound were examined. Patients were questioned regarding paraesthesia or altered sensation in groin area. The presence of recurrent hernia was carefully looked for.

Following discharge the patient was evaluated for:

- Pain measured by Visual Analogue Scale (VAS).
- Resumption of daily activity.
- Wound infection.
- Any complication
- Time required to return to work.

Wound infection was diagnosed, based on the presence of purulent discharge from the wound or organism grown from swabs taken from the wound, in case wound was required to be opened due to severe redness or induration.

Results were evaluated by classifying surgical complication on severity scale graded from 1 to 5.

Grade I:
- Deviation from ideal postoperative course without need of pharmacological treatment, surgical, endoscopic, radiological intervention.
- Allowed therapeutic regimens are drugs such as antiemetic, antipyretic, analgesic, diuretics, physiotherapy. This grade also includes wound infections open at bedside.

Grade II: Requiring pharmacological treatment within drugs other than such allowed for grade I complication. Blood transfusion and total parenteral nutrition are also included.

Grade III: Requiring surgical endoscopic or radiological intervention.
- IIIa Intervention not under general anesthesia
- IIIb Intervention under general anesthesia.

Grade IV: Life threatening complication requiring ICU management
- IVa Single organ dysfunction
- IVb Multiple organ dysfunction.
Grade V Death of patient

Patients were questioned regarding the presence of complication and their subjective satisfaction with hernia repair experience. The time of return to work was noted. No patient required reoperation in this study. Patients of both groups were followed regularly up to 6 months. Hernia recurrence was defined as a palpable, reducible lump in the treated groin, with or without symptoms. In patients with persistent discomfort, or if full recovery was not achieved at the 8-week visit, extra visits were performed at intervals of 4 weeks until full recovery was noted.

Time to full recovery and to end of sick leave was noted by the patient in a self-administered record form. The time to full recovery was defined as when inguinal discomfort did not interfere with normal daily or athletic activities.

In terms of sick leave, the patient received written instructions and was encouraged to return to his normal work as soon as he found himself able. After the operation, the patient received an under treatment certificate for 1 week, if needed. This certificate was renewed at the patient’s request for 1 week at a time by visit until he could return to work. There were no other restrictions on physical activity, other than the patient’s own experience of pain and discomfort. If the patient’s work involved strenuous physical activity, he was advised light work if this was permissible in these terms of employment.

OBSERVATION & RESULTS

All patients in this study were male between the age group of 15 to 70 years. Out of 25 cases taken for laparoscopic inguinal hernioplasty, 2 cases were converted to open hernioplasty giving a conversion rate of 8%.

Reasons for conversion were as follows;

- Excessive bleeding spoiling operative field
- Dense adhesions between sac and cord structures making dissection difficult.

In our study the reason for conversion in both cases was dense adhesions and bleeding resulting in obscuring of the operative field.

In the laparoscopy group, 8% (n=2) of cases developed grade I complications as compared to 0% in open group.

Two patients developed seroma as complication in laparoscopy group which was managed conservatively.

No case of mesh infection or wound infection was found in both groups.

No case of recurrence was found in either of the arms of the study.

Chart I Showing comparison of complication among study groups.

There was no case of grade 2, grade 3, grade 4 complications in either the groups, and there was no mortality.

Mean operating time in patients undergoing laparoscopic hernioplasty was 133 minutes as compared to 94.20 minutes in patients who underwent open inguinal hernioplasty.

Table:1 comparison of duration of surgery

<table>
<thead>
<tr>
<th>Duration of surgery</th>
<th>N</th>
<th>Mean (Min)</th>
<th>SD</th>
<th>Median</th>
<th>Quartile Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mann-Whitney U test</th>
<th>p-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAP</td>
<td>25</td>
<td>133.00</td>
<td>22.59</td>
<td>135.00</td>
<td>30.00</td>
<td>100.00</td>
<td>180.00</td>
<td>80</td>
<td>0.000006</td>
</tr>
<tr>
<td>Open</td>
<td>25</td>
<td>94.20</td>
<td>26.01</td>
<td>90.00</td>
<td>20.00</td>
<td>60.00</td>
<td>150.00</td>
<td>Difference is significant</td>
<td></td>
</tr>
</tbody>
</table>
On Post-Op day 1 & 2, the patients who underwent laparoscopic hernioplasty had less pain as compared to those undergoing open hernioplasty. Mean pain score values in the laparoscopic and open groups were 2.36 vs 4.32 respectively on POD 1 and 1.13 vs 2.39 respectively on POD 2, which was statistically significant. On post-op day 3, patients undergoing laparoscopic hernioplasty had a mean pain score of 1.13 as against a mean score of 1.36 in the open group. However, this was not statistically significant. This is evident in tables 2, 3 & 4 below.

<table>
<thead>
<tr>
<th>Table:2 Pain on post operative day 1</th>
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<tbody>
<tr>
<td>Pain Post Op day 1</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>LAP</td>
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<tr>
<td>Open</td>
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Difference is significant

<table>
<thead>
<tr>
<th>Table:3 Pain in post op day 2</th>
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</thead>
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<tr>
<td>Pain Post Op 2</td>
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<tr>
<td>N</td>
</tr>
<tr>
<td>LAP</td>
</tr>
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<td>Open</td>
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</table>

Difference is significant

<table>
<thead>
<tr>
<th>Table:4 Pain in post op day 3</th>
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</thead>
<tbody>
<tr>
<td>Pain Post Op 3</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>LAP</td>
</tr>
<tr>
<td>Open</td>
</tr>
</tbody>
</table>

Difference is not significant

Patients who underwent laparoscopic hernioplasty required significantly lesser number of doses of analgesic as compared to those undergoing open hernioplasty. The mean required dosages for the 2 groups are shown in the Table 5, 6 & 7 below. Comparison of requirement of analgesic on postoperative day 1, 2, 3.

<table>
<thead>
<tr>
<th>Table:5 Comparison of requirement analgesic on POD 1</th>
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<tbody>
<tr>
<td>Analgesic D1</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>LAP</td>
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<td>Open</td>
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</table>

Difference is significant

<table>
<thead>
<tr>
<th>Table:6 Comparison of requirement analgesic on POD 2</th>
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<tr>
<td>Analgesic D2</td>
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<tr>
<td>N</td>
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Difference is significant

<table>
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<th>Table:7 Comparison of requirement analgesic on POD 3</th>
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<tr>
<td>Analgesic D3</td>
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<td>N</td>
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<td>Open</td>
</tr>
</tbody>
</table>

Difference is significant
The patients who had undergone laparoscopic hernioplasty resume normal activity earlier with a mean of 1.52 days as compared to 2.68 days in patients who had undergone open inguinal hernioplasty and difference between the two is statistically significant as shown in table 8.

<table>
<thead>
<tr>
<th>Resume normal activity</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Quartile Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mann-Whitney U test</th>
<th>p-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAP</td>
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<td>1.52</td>
<td>0.65</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>3.00</td>
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<tr>
<td>Open</td>
<td>25</td>
<td>2.68</td>
<td>0.75</td>
<td>3.00</td>
<td>1.00</td>
<td>1.00</td>
<td>4.00</td>
<td>Difference is significant</td>
<td></td>
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</table>

The patients who had undergone laparoscopic inguinal hernioplasty returned to work earlier with a mean of 10.44 days as compared to 15.76 days in patients who had undergone open inguinal hernioplasty and difference between the two is statistically significant as shown in table 9.

<table>
<thead>
<tr>
<th>Return to work</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Quartile Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mann-Whitney U test</th>
<th>p-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAP</td>
<td>25</td>
<td>10.44</td>
<td>2.14</td>
<td>10.00</td>
<td>2.00</td>
<td>7.00</td>
<td>16.00</td>
<td>19</td>
<td>1.27E-08</td>
</tr>
<tr>
<td>Open</td>
<td>25</td>
<td>15.76</td>
<td>2.60</td>
<td>15.00</td>
<td>4.00</td>
<td>12.00</td>
<td>21.00</td>
<td>Difference is significant</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

It was observed in this study the mean operating time for patient undergoing laparoscopic hernioplasty was significantly more as compared to that of patients undergoing open inguinal hernioplasty.

The time required for return to work for patients undergoing laparoscopic inguinal hernioplasty was significantly lower as compared to that of open inguinal hernioplasty.

There have been several prospective, randomized trials comparing open inguinal hernioplasty with laparoscopic inguinal hernioplasty like Langeveld, Hester[46]. 336 patients were randomized to TEP and 324 to Lichtenstein repair. TEP was associated with less postoperative pain until 6 weeks postoperatively (P = 0.01). Mean operating time for a unilateral hernia with TEP was longer (54 vs. 49 minutes, P = 0.03) but comparable for bilateral hernias. After TEP, patients had a faster recovery of daily activities (ADL) and less absence from work (P = 0.01). After a mean follow-up of 49 months, recurrences (3.8% vs. 3.0%, P = 0.64) and total costs (£3.096 vs. £3.198) were similar. Neumayer et al [47] reported that Patients in the open-repair group had significantly greater levels of pain (at rest, at work or during exercise, and during normal activities) than did those in the laparoscopic group during the two-week postoperative assessment period.

These findings were similar to our study where pain score was lower in laparoscopic group as compared to open.

CONCLUSION

Inguinal mesh hernioplasty is one of the common procedures performed throughout the world. The laparoscopic approach to inguinal hernioplasty is now well established. The laparoscopic approach offers advantages in terms of lesser postoperative pain and analgesic requirements as well as a significantly early return to work. The incidence of chronic debilitating pain is also significantly lower than with open mesh repair.

It offers the advantage of examining the opposite side for the presence of a small hernia sac. In cases of recurrent hernia, following previous open mesh repair, the laparoscopic approach allows access to the hernial site without going through scarred tissues or mesh.

The laparoscopic procedure however requires significantly longer operating time at least in unilateral cases. However, the operating time in bilateral cases is not significantly different. The laparoscopic procedure also has a long learning curve and surgeons with greater experience with the procedure are able to have shorter operating times as well as fewer complications.
The laparoscopic approach is also accompanied by significant procedure-related complications viz. injury to bowel and bladder and injury to vessels.

BIBLIOGRAPHY

3. Maingoat’s abdominal operations 11th edition p-103
5. van Veen RN van waseem KJ Halm JA patent processus vaginalis in adult as risk factor for occurrence of indirect inguinal hernia.
8. Maingoat’s abdominal operations 11th edition p-107
10. Ramakrishna HK IJS,2004; 66 P.249-250

BMC Surgery 2005;37:185-190 (DOI: 10.1159/000085967)
25. Causes of recurrence in laparoscopic inguinal hernia repair, Kukleta Jan F Klinik Im Park, Zurich, Switzerland.J MAS.2006; 2[3]:187-191
46. Langeveld, Hester R. MD Total Extraperitoneal Inguinal Hernia Repair Compared With Lichtenstein (the LEVEL-Trial): A Randomized Controlled Trial May 2010 - Volume 251 - Issue 5 - pp 819-824 doi: 10.1097/SLA.0b013e3181d96c32 Randomized Controlled Trials.
49. Schwatz’s principles of surgery 9th edition p-1316 -1339
51. Sabiston textbook of surgery 18th edition p-1332