Evaluation of cases of laparoscopic inguinal hernia repair at government medical college Vadodara

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ABSTRACT
BACKGROUND: The objective was to evaluate the indications, procedure, and complications of laparoscopic hernia repair as new means of management of inguinal hernia. MATERIALS AND METHODS: This observational prospective cohort study has been carried out in 70 cases of inguinal hernia, admitted to surgery “D” unit in Sir Sayajirao General Hospital, Vadodara from June 2006 till December 2008. RESULTS: Out of 70 patients: 44 patients undergone TEP repair (63%), 22 patients TAPP (31%), two cases converted to open hernioplasty due to inadequate dissection during TEP repair. (53) unilateral inguinal hernias, (36) indirect inguinal hernia. (5) complete inguinal hernia, (65) incomplete hernia. Majority of cases [87.14%], (76 sites) polypropylene mesh (5) vypro mesh was used. (47 tackers) ipsilateral Cooper’s ligament, average duration of surgery is 80 minutes. Majority of the cases had VAS scale of –2(52.85%) on first post-op day. (2) small seroma, (4) patients has recurrence of hernia. CONCLUSION: Laparoscopic inguinal hernia repair is an effective procedure for management of inguinal hernia, preferred in treatment of bilateral hernias and recurrent hernias after open repair. Entire myopectineal orifice covered. Reduced postoperative pain, earlier return to work.

INTRODUCTION
Evidence based, laparoscopic revolution promised less pain, improved cosmesis, and shorter disability. Although laparoscopic repair of a groin hernia was first performed by Ralph Ger in 1982, it was not until 1990 that its role in hernia surgery began to be explored by the general surgeon.

The largest meta-analysis study- EU Biomed showed laparoscopic repair was associated with reduced recurrence rate when compared with open non-mesh repair. (OR, 1.26; 95% CI, 0.76–2.088; P = 0.4)

Aims of study
The aims and objectives of study of this study are as follow:
1. To evaluate procedure of laparoscopic hernia repair as means of management of inguinal hernia.
2. To evaluate the indications of laparoscopic inguinal hernia repair.
3. To assess response of various methods of laparoscopic inguinal hernia repair.
4. To evaluate complication rates and morbidity of patients treated by laparoscopic inguinal hernia repair.
5. To evaluate advantages and disadvantages of laparoscopic inguinal hernia repair.

Reviews of literature:
In 1982, Dr Ger and colleagues performed the first laparoscopic inguinal hernia repair in dogs by stapling the abdominal opening of the patent processus vaginalis. Other minimally invasive techniques were later developed, including a plug and patch repair and an intraperitoneal onlay mesh repair. The intraperitoneal onlay mesh [IPOM] repair involved placing mesh over
the inguinal hernia defect intra-abdominally without performing a pre-peritoneal dissection.

Today most laparoscopic inguinal hernia repairs are performed with placement of a synthetic mesh in to the pre-peritoneal space, which can be accomplished in one of two ways: the transabdominal preoperational (TAPP) approach or the totally extraperitoneal (TEP) approach.

Complications:11,12

The medical Research council Laparoscopic Groin Hernia group reported 3 major complications: bladder injury, common iliac artery injury, lateral femoral cutaneous nerve. Post operative pain

At one year after the operation the laparoscopic group in the MRC trial had a significantly lower rate of persistant groin pain then those who had open mesh repair (28.7% vs. 36.7%).11,14,15

Anatomy of the Inguinal Region and the Anterior Abdominal Wall from a Laparoscopic Perspective:
The laparoscopic surgeon does not have the luxury of direct palpation and therefore must rely heavily on visual cues.

The loose connective tissue between the pubis and the bladder/anterior abdominal wall is called the retro pubic space of Retzius. Bogros' space represents the lateral extension of the space of Retzius and contains anatomical structures critical to the laparoscopic surgeon. The iliopubic tract is an aponeurotic band formed by the condensation of the anterior layer of transversalis fascia blended with the transverses abdominis aponeurosis. The external spermatic vessel and the iliopubic branch, which anastomoses via the corona mortis (found in a third of patients) to the obturator artery system. The nerve branches of the lumbar plexus that can be damaged during laparoscopic dissection vary in their course but generally lie in what is referred to as the "electrical hazard zone" (bordered medially by the spermatic cord, superiorly by the iliopubic tract, and laterally by the iliac crest). Electrocautery should not be used in this region. This area is also referred to as the "triangle of pain" by some authors, and contains (from lateral to medial) the lateral femoral cutaneous, the anterior femoral cutaneous, the femoral branch of the genitofemoral, and the femoral nerves. The staple in this area should be less because nerve entrapment can cause neuralgia.

Another area in which caution should be heeded is the area referred to as the "triangle of doom" (bordered by the vas deferens medially, gonadal vessels laterally, and peritoneal edge posteriorly), containing the external iliac vessels, the deep circumflex iliac vein, the femoral nerve, and the genital branch of the genitofemoral nerve. Staple should not be applied in this triangle otherwise; chances of mortality are there if these great vessels are injured.

MATERIALS AND METHODS
This observational prospective cohort study has been carried out: 70 cases of inguinal hernia, admitted to surgery "D" unit in Sir Sayajirao General Hospital, Vadodara from June 2006 till December 2008.

Inclusion criteria:


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1. Presence of an uncomplicated unilateral/Bilateral inguinal hernia.
2. Recurrent inguinal hernia

Exclusion criteria:
1. Large scrotal, Obstructed and strangulated inguinal hernia.
2. Pt unfit for G/A.
3. Intra-abdominal infection.
4. Previous surgery in retropubic space.

MATERIALS AND METHODS

Laparoscopic hernia repair performed using standard technique described in literatures after workup of a patient for general anaesthesia.

Post operative pain assessment day 1 and on day of discharge: Vas scale: 11,24

Patients were discharged to home on second day after surgery. Patients return for follow-up at 1 week, 4 weeks, and then as needed. Further follow up was on telephonic questionnaires.

RESULTS

Table: 1 Type laparoscopic hernia repair.

Study of 70 cases (male) of inguinal hernia; who underwent laparoscopic hernia repair by various methods was carried out.

Table: 2 Variety of hernia:
51 patients had direct and 36 patients had indirect inguinal hernia. 5 patients had complete inguinal hernia.

Table: 3 Size of mesh used

Table: 4 Type of mesh used

Table: 5 Fixation of mesh:
Total 85 endotacker used for mesh fixation. In 5 cases mesh was not fixed at all.

Table: 6 Duration of surgery
In this series average duration of surgery is 80 minutes.

Average duration of TEP—47.77 minutes; while of TAPP—102.61 minutes.

Table: 7 Post-op hospital stay
Majority of the patients were allowed to go home after uneventful post-operative recovery after 2 days.

Table: 8 Pain assessment by VAS on first post-operative day

Post-operative pain assessment done by visual analogue scale which revealed the following figures on first post-operative day, second day and on the day of discharge.

67 cases (96%) had VAS of 1 on the day of discharge.

Table: 9 Complications

<table>
<thead>
<tr>
<th>Complication</th>
<th>No. of cases</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balloon Rupture</td>
<td>5</td>
<td>7.14%</td>
</tr>
<tr>
<td>Peritoneal tear</td>
<td>8</td>
<td>11.42%</td>
</tr>
<tr>
<td>Damage to IEV</td>
<td>1</td>
<td>1.42%</td>
</tr>
<tr>
<td>Post-op collection</td>
<td>2</td>
<td>2.85%</td>
</tr>
<tr>
<td>(seroma)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrence</td>
<td>4</td>
<td>5.71%</td>
</tr>
<tr>
<td>Conversion to open hernia repair-difficult dissection</td>
<td>2</td>
<td>2.85%</td>
</tr>
</tbody>
</table>
Recurrant hernia
There were three patients in this study; who had undergone previous open groin hernia repair. Two were successfully repaired by TAPP; while one patient was converted to open hernia repair due to difficult dissection.

Advantages of laparoscopic inguinal hernia repair.\[1,11,22,23,24\]
1. Less post operative pain and discomfort.
2. Reduced recovery time allowing an earlier return to routine activity.
3. Expose the entire myopectineal orifice.--[treat missed hernia].
4. Tension free repair that reinforces the entire myo-pectoneal orifice.
5. Easier repair of recurrent hernia, Because the repair is performed in tissue that has not been previously dissected.
6. The highest possible ligation of hernial sac.
7. Less tissue dissection and disruption of tissue planes.
8. Three ports are adequate for all type of hernia.
9. Low intra-operatively and postoperative complications.
11. Ability to repair bilateral hernia.
12. Improved Cosmesis.

Cost effectiveness\[1,11\]
If the surgeon were to adopt cost-containment strategies such as use of reusable laparoscopic instruments as against disposable ones, use of indigenous balloons devices rather than commercially available ones, sparing use of fixation devices and reliance on sutures for fixation of the mesh, the cost of the laparoscopic hernia repair should be comparable to the open repair. Societal costs due quicker recovery and return to employment show clear advantages for the laparoscopic repair, the reduction in chronic groin pain after laparoscopic repair is likely to lead to savings in both direct hospital costs and societal costs.

Drawbacks of laparoscopic hernia repair:\[11\]
long learning curve. This is compounded by the fact that the average surgeon only repairs around 50 inguinal hernias per year.

Comparison with other studies\[1,6,7,11,22,23,24\]
A. TAPP repair
1. Average duration of surgery is 102 minutes in this study; which is longer as compared with previous clinical trials as shown in table.
2. Our complication rate [4.54\%] is much less than those of other trials. It is interesting to note that, despite the excellent results from laparoscopic experts, visceral injury continues to be reported. In the series reported by Bittner et al. there were eight bladder and nine bowel injuries among the 6479 patients undergoing TAPP repair.
3. Recurrence rate of our study [4.54\%] is higher than other studies.
4. Most of the patients returned to routine activities within 7 days of surgery; which is faster than those with other studies.

B. TEP repair:
1. Our procedure took average 47 minutes for TEP repair; which is much faster than other studies.
2. Complications rate [9.09\%] of our study is much less than other previous studies. Complications were minor and included accidental peritoneal tear, balloon rupture, post-operative seroma formation at local site, and recurrence. In the study by Tamme et al. eight bladder injuries were observed in 3868 patients undergoing TEP.
3. Three patients had recurrence of hernia [6.80\%], which is more than previous studies.
4. Within seven days of operation; most of the patients were able to do routine activities, which shows faster recovery as compared with previous studies.

TEP vs TAPP\[11,31\]
1. Average duration of surgery is 55 minutes longer in TAPP than in TEP repair.
2. For direct inguinal hernia TEP repair is preferred while for indirect inguinal
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1. For recurrent inguinal hernia after open hernia repair; TAPP repair is preferred (P-0.003).

2. For recurrent inguinal hernia after open hernia repair; TAPP repair is preferred (P-0.003).

3. For recurrent inguinal hernia after open hernia repair; TAPP repair is preferred (P-0.003).

4. For recurrent inguinal hernia after open hernia repair; TAPP repair is preferred (P-0.003).

CONCLUSION

1. Laparoscopic inguinal hernia repair is an effective procedure for management of inguinal hernia.

2. Laparoscopic inguinal hernia repair is preferred in treatment of bilateral hernias and recurrent hernias after open repair.

3. Post operative pain is less; hence decreased need of analgesics.

4. Average post operative hospital stay is decreased; with earlier return to routine activities.

5. Laparoscopic inguinal hernia repair was associated with less complications like post-operative neuralgia, wound complications - which are common in open hernia repair.

6. Conventional anterior open mesh repair, do not address enteric myo-pectineal orifice; so bilateral and femoral hernia can be missed, which can be manged by laparoscopic repair.

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