POST-OPERATIVE PAIN AND LENGTH OF HOSPITAL STAY IN OPEN AND LAPAROSCOPIC HERNIOPLASTY - A COMPARATIVE STUDY
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ABSTRACT

BACKGROUND
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. Hernia repair is one of the most common operations performed by general surgeons. About 75% of all hernias occur in the inguinal region. Two thirds of these are indirect and the remainder are direct inguinal hernias. Femoral hernias represent only 3% of all groin hernias. Open Lichtenstein mesh repair and laparoscopic mesh repair are widely being practiced across the world. The aim of this study is to demonstrate the difference in post-operative pain and length of hospital stay in open and laparoscopic methods.

MATERIALS AND METHODS
The study population included 48 patients who underwent hernia repair surgery in a tertiary care hospital in North Kerala during the period of 2015 to 2017. Patients presented with direct inguinal hernia in surgical OPD were selected and divided into two groups. One group underwent open Lichtenstein’s mesh repair and the other group underwent laparoscopic TAPP repair. Post-operatively, pain was assessed 5 hrs after surgery on day 1, 24 hours post-surgery, and on day 7. Length of hospital stay was measured in hours.

RESULTS
Among the 48 patients with direct inguinal hernia, 28 patients underwent open mesh repair and 20 patients underwent laparoscopic TAPP repair. The mean age of the study population was 50. Post-operative pain was significantly lesser in laparoscopy group with 70% of patients having a pain score of 3 in a scale of 0 to 10. Patients in the open surgery group had pain perception of 5 in a scale of 0-10. The duration of hospital stay was lesser in laparoscopy group, 32 hours compared to the open surgery groups 46 hours.

CONCLUSION
In patients who underwent laparoscopy, the intensity of post-operative pain was significantly lesser. Length of hospital stay was also shorter in laparoscopy group compared to the patients who had undergone Lichtenstein’s repair.

KEYWORDS
Laparoscopic, Lichtenstein’s, Post-Operative Pain, Hospital Stay.

hernias are rare in men. 10% of women and 50% of men who have a femoral hernia have or will develop an inguinal hernia. The most common subtype of groin hernia in men and women is the indirect inguinal hernia.\(^2\) Anterior repairs are the most common operative approach for inguinal hernias. Lichtenstein’s tension-free repairs are now standard, and there are a variety of different types.\(^3\) Older tissue types of repair are rarely indicated, except for patients with simultaneous contamination or concomitant bowel resection, when placement of a mesh prosthesis may be contraindicated. Laparoscopic inguinal hernia repair is another method of tension-free mesh repair based on a preperitoneal approach. The laparoscopic approach provides the mechanical advantage of placing a large piece of mesh behind the defect, covering the myopectineal orifice, and using the natural forces of the abdominal wall to disperse intra-abdominal pressure over a larger area to support the mesh in place. Proponents have touted quicker recovery, less pain, better visualization of anatomy, and usefulness for fixing all inguinal hernia defects. Critics have emphasized longer operative times, technical challenges, increased risk of recurrence, and increased cost. Laparoscopic repair is also associated with an approximately 0.3% risk of visceral or vascular injury.\(^4\) When considering the laparoscopic approach for repair of inguinal hernias, the surgeon has several options. The most popular techniques are totally extraperitoneal (TEP) and transabdominal preperitoneal (TAPP) approaches. The main difference between these two techniques is the sequence of gaining access to the preperitoneal space. In the TEP approach, the dissection begins in the preperitoneal space using a balloon dissector. With the TAPP repair, the preperitoneal space is accessed after initially entering the peritoneal cavity.

**MATERIALS AND METHODS**

The aim of the study is to compare the laparoscopic surgery and open Lichtenstein’s mesh repair with respect to postoperative pain and duration of hospital stay. The study duration was from March 2015 to April 2017. Patients presented with direct inguinal hernia in surgical OPD were selected and divided into two groups. One group underwent open Lichtenstein’s mesh repair and the other group underwent laparoscopic TAPP repair. Post-operative pain was assessed on day 1, day 2 and day 7. Length of hospital stay was measured in hours.

**Inclusion Criteria**

1. Patients presented with clinically diagnosed direct inguinal hernia in department of General and Laparoscopic surgery. Male patients between the age of 40 to 65.

**Exclusion Criteria**

1. Recurrent hernias and complete inguinoscrotal hernias.
2. Irreducible or obstructed hernias
3. History of trans vesical prostatectomy.

Patients awaiting hernioplasty were randomly selected for open and laparoscopic procedures. Preoperative medical fitness assessment was done for all patients. Necessary permission was obtained from the hospital ethical committee. All cases were operated in the 2nd surgical unit of the hospital. Of the two groups of patients, group A which included 28 patients underwent open Lichtenstein’s mesh repair under spinal anaesthesia and group B which included 20 patients underwent laparoscopic trans abdominal pre-peritoneal TAPP repair under GA. Laparoscopy was done using 3 ports. One 10 mm port at the umbilicus and two lateral 5 mm ports each 7 cm away from the umbilicus just lateral to the rectus muscle. Entire myopectineal orifice was covered by the mesh. Non-absorbable polypropylene mesh was used in both open and laparoscopic methods.

All patients were admitted in post-operative ICU for a period of 5 to 8 hours post-surgery. The perception of postoperative pain was assessed by visual analogue scale for pain at 5 hours after surgery. The patients were instructed to rate the pain by a 0 to 10 scale depending on the severity.

**Distribution of Cases**

<table>
<thead>
<tr>
<th>Number of Cases in Percentage</th>
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<tbody>
<tr>
<td>open</td>
</tr>
<tr>
<td>laparoscopic</td>
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</table>

**RESULTS**

During our study, we analysed a total 48 patients, of which 28 were operated by open technique and 20 underwent laparoscopic inguinal hernioplasty. Right inguinal hernia was more common. 55 % of the study group presented with right inguinal hernia. The youngest patient was aged 31 and the oldest was 70. All patients in the study group were males. Hypertension was commonest comorbid condition followed by type 2 diabetes mellitus. The mean operative time for open Lichtenstein’s repair was 62 minutes and that of laparoscopic repair was 71 minutes. There was no significant perioperative morbidity, mortality or surgery related major complications in any group. There were seromas developed in 4 patients from the laparoscopy group. Seromas were developed 10 to 15 days after surgery. All disappeared by itself within 3 to 5 weeks. Post-operative wound drainage was not done in any of the patients.

**Table 1. Mean Operative Time**

<table>
<thead>
<tr>
<th>Mean Operative Time</th>
<th>(Minutes)</th>
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<tbody>
<tr>
<td>Open</td>
<td>62.25</td>
</tr>
<tr>
<td>Laparoscopic</td>
<td>71.56</td>
</tr>
</tbody>
</table>

**Graph 1**

**Table 1. Mean Operative Time**
Post-operative pain was significantly lesser in laparoscopy group. 70% of patients had pain score of 3 in a scale of 0 to 10. Patients in the open surgery group had pain perception of 5 in a scale of 0-10.

**Pain Analog Score**

![Figure 1](image1)

![Figure 2](image2)

**DISCUSSION**

Surgical repair is the definitive treatment of inguinal hernias. Inguinal hernias may be congenital or acquired. Most adult inguinal hernias are considered acquired defects in the abdominal wall although collagen studies have demonstrated a heritable predisposition. A number of studies have attempted to delineate the precise causes of inguinal hernia formation; however, the best-characterized risk factor is weakness in the abdominal wall musculature. Diagnosis is often made by clinical examination. Ultrasonography also can aid in the diagnosis. There is a high degree of sensitivity and specificity for ultrasound in the detection of occult direct, indirect, and femoral hernias. Computed tomography (CT) of the abdomen and pelvis may be useful for the diagnosis of obscure and unusual hernias as well as atypical groin masses. Most surgeons recommend operation on discovery of a symptomatic inguinal hernia because the natural history of a groin hernia is that of progressive enlargement and weakening, with a small potential for incarceration and strangulation. Anterior repairs are the most common operative approach for inguinal hernias.

(Laparoscopic repair involves significantly smaller skin incisions and lesser tissue retraction. As per physiology of nociception, pain perception begins with free nerve endings. Lesser number of free nerve endings are stimulated in laparoscopic surgery by virtue of smaller incisions and lesser tissue retraction and trauma. Processing of noxious stimuli is less. The subjective feeling of pain is lesser due to decreased activation of the pain pathways. This results in decreased pain perception during the post-operative period).

Tension-free repairs are now standard, and there are a variety of different types. Polypropylene and polyester are the most common synthetic prosthetic materials used in hernia repair. An ideal mesh should be easy to handle, flexible, strong, immunologically inert, contraction-resistant, infection resistant, and inexpensive to manufacture. Light weight mesh have greater elasticity and less theoretical surface area contact with surrounding tissues than their heavyweight counterparts. The use of lightweight mesh in TEP and TAPP repairs is associated with fewer 3-month cumulative mesh-related complications. Post-herniorrhaphy inguinodynia is a debilitating chronic complication caused by a combination of nociceptive, neuropathic, and visceral elements. When inguinodynia is refractory to pharmacologic and interventional measures, triple neurectomy with removal of meshoma is arguably the most effective option for the majority of patients.

One study found prosthetic mesh may exert long-term deleterious effects upon the vas deferens, causing azoospermia. Regarding laparoscopic complications, the risks of the TEP technique mirror those of open anterior repairs, as the peritoneal space is not violated. Complications of transabdominal laparoscopy include urinary retention, paralytic ileus, visceral injuries, vascular injuries, and less commonly, bowel obstruction, hypercapnia, gas embolism, and pneumothorax.

**CONCLUSION**

In patients who underwent laparoscopy, the intensity of post-operative pain was significantly lower. Length of hospital stay was also shorter in laparoscopy group compared to the patients who had undergone Lichtenstein’s repair. Duration of procedure was slightly longer in laparoscopy. There was no significant difference in post-operative complications and post-operative quality of life in both the study groups. However, patients who underwent laparoscopy were able to return to routine physical activities earlier than those who underwent open Lichtenstein’s repair.

**REFERENCES**


