

Open Preperitoneal Mesh Repair of Inguinal Hernia- A Better Approach for the Novice Surgeons

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ABSTRACT

Introduction: Inguinal hernia is a common surgical problem in advanced age group, but repair of inguinal hernias after prosthetic mesh repair is usually difficult due to considerable surgical methods, experience and complications. The study is a clinical trial done on patient with any type of inguinal hernia, who were treated by open preperitoneal mesh repair and darning of overlying musculoaponeurotic layers with prolene sutures.

Objectives: To study the operating time, hospital stay, postoperative complications and recurrence rate associated with open preperitoneal mesh repair and darning of overlying musculoaponeurotic layers with prolene sutures by novice surgeons.

Materials and methods: This observational clinical study in 250 patients having any types of inguinal hernias in new and recurrent cases. The period October 2017 to October 2019 was conducted at department of surgery of Bashundhara Ad-din Medical College Hospital and other private hospitals. The age, gender, operating time, hospital stay, postoperative complications rate and recurrence rate of the patients were evaluated.

Results: There were no serious intraoperative complications, there were 230 men and 20 women in the study, whose average age 41.50 (30-72) years. The average operative time taken to complete the surgery and hospital stay were 45.30 (30-120) minutes and 1.5 (1-3) days respectively. Complications include urinary retention in 10%, seroma in 2% and superficial surgical site infection in 2% patients. No recurrence was encountered post-surgery in any of the case till the last follow-up.

Conclusions: We concluded that the open preperitoneal mesh repair and darning of overlying musculoaponeurotic layers with prolene sutures is a safe, easier, time consuming and effective methods in a novice surgeon with fewer complications as compared to other conventional open hernia mesh repairs and laparoscopic hernia repairs.

Keywords: Inguinal Hernia, Open preperitoneal mesh repair, Darning, Novice Surgeons.

Introduction

Hernia (Latin, rupture; Greek, bud) defined as protrusion of any viscus or part of a viscus through an opening in the wall of the cavity in which it is contained¹. Mesh repair of inguinal hernia is the most common operations performed on general surgical patients. Approximately 20 million groin hernioplasties are performed each year worldwide, over 17000 operations in Sweden, over 12000 in Finland, over

80000 in England and over 800,000 in USA²⁻⁵. Recurrence of inguinal hernia was initially a significant problem; however, with the advent of tension free mesh repair as described as Lichtenstein repair, recurrence rate has consistently been reported as slow as 1-4 % (6-10), a drop from up to 50-60%⁶. Surgeons continue to search for the optimum repair method with the least recurrence and least complications.

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Multiple tension-free techniques are available now, which include the open anterior approach, the open posterior approach and the closed posterior approach (laparoscopic)⁷. While numerous surgical approaches exist to treat inguinal hernia, we present a clinical trial of 250 patients of which open preperitoneal mesh repair of inguinal hernias with darning of musculoaponeurotic layers with prolene sutures⁸.

Materials and Methods:

This is a prospective, randomized, clinical trial, conducted in 250 patients of any type of inguinal hernias, in new and recurrent cases, in the department of surgery of Bashundhara Ad-din Medical College Hospital and other private hospitals, from October 2017 to October 2019. The patients in the age group of 30-72 years were included in this trial. Most of the patients were admitted before operation for routine preoperative laboratory test. Single dose of a 1st generation cephalosporin was given for the prophylaxis of wound infection. The urinary bladder was emptied before the operation.

Under suitable anesthesia, an oblique incision was made 2 cm above and parallel to the medial 2/3rd of the inguinal ligament. The external oblique aponeurosis was cut up to the superficial inguinal ring, so as to expose the whole of inguinal canal. The ilio-inguinal and ilio-hypogastric nerves were identified and preserved. Spermatic cord was identified and pulled up from inguinal canal. In the cases of indirect hernias, the investing layers of internal spermatic fascia and cremasteric fascia surrounding the cord were split open, cremasteric branches supplying the cremasteric muscles and other covering the cord could bleed, when cremasteric layer was dissected off the spermatic cord. Bleeding points were picked up and coagulated with diathermy. Then the hernia sac was identified and opened, the contents were reduced and the sac was transfixed with vicryl suture.



Figure 1: Inguinal hernial incision



Figure 2: Opening through posterior wall



Figure 3: preperitoneal mesh placement



Figure 4: Darning of musculoaponeurotic layers



Figure 5: skin closure

The proximal part of the hernia sac was dissected up to its neck, where the inferior epigastric vessel was identified. About 2-3cm aperture was created in between the rings through the posterior wall of the inguinal canal up to fascia transversalis, about 2cm above the inguinal ligament by blunt dissection, then finger dissection medially up to the midline, laterally near to the anterior superior iliac spine and 4-6cm above the inguinal ligament. During dissection of preperitoneal space we encountered pubic branch of inferior epigastric artery in 20 cases which were injured in 6 cases unintentionally and in the other cases it were identified and secured safely. Prolene mesh 7.6cm X 15cm and 6.25cm X 11.25cm were

used and depending upon the patients build and posterior wall defect. Mesh was tailored and a slit was created in its lateral part, which encircle the spermatic cord snugly at the level of the internal ring. Mesh was placed behind the fascia transversalis and inferior epigastric vessels in the preperitoneal fat space by finger or dissecting forceps. Then posterior wall of the inguinal canal aperture was closed by absorbable suture. Internal ring was narrowed whenever it was wide. For additional benefit darning between inguinal ligament and conjoint muscles and tendons were performed with continuous interrupted non absorbable sutures. Spermatic cord was placed over it and external oblique aponeurosis was closed with continuous absorbable sutures. The subcutaneous and subcuticular closure was done with absorbable sutures and the skin was interrupted nonabsorbable sutures.

Table I: Demographic data:

Age (mean)	: 41.50 (30-72)
Sex (M/F)	: 230/20
Mean operation time	: 45.30 min(30-120)
Mean hospital stay	: 1.5 days (1-3)
Types of hernia	:
Indirect	: 200
Direct	: 30
Recurrent	: 20
Types of anesthesia	:
General	- 14
Spinal	- 235
Local	- 01

Table II: Postoperative Complications:

Early Postoperative Complications (%)	
Urinary Retention	- 10
Wound infection (SSSI)	- 2
Post-operative death	- 0
Late postoperative complications (%)	
Mesh infection	- 0
Hematoma	-0
Seroma	- 2
Testicular atrophy	- 0
Recurrence`	- 0

Results:

Out of 250 patients, 200 had indirect hernia, 30 had direct hernia and 20 had recurrent hernias. The mean age of the patients were 41.50 years (range: 30-72 years). The average time taken to complete surgery was 45.30 minutes and average hospital stay was 1.5 days (Table-I). There were no serious adverse effects of the anesthesia in these 250 patients. At a median follow-up period of 1 year. Only 25 patients developed urinary retention, had needed indwell catheterization, only 5 patients had seroma formation, of which 3 resolves spontaneously and, in the other, it was large and was frequent aspirated and only 5 patients encountered superficial Surgical site infection (SSSI), had needed daily dressing and added additional antibiotic and changes of antibiotic, No other postoperative complications in the patients (Table-II). No recurrence was encountered in post-surgery in any of case till the last follow-up period.

Discussion:

About 80% of hernias are inguinal and 92% are in men, 20% of which occurs below 35 years of age. The pathophysiology of an indirect inguinal hernia is a patent or partially patent processus vaginalis (through deep inguinal ring) lateral to the inferior epigastric vessels. Direct inguinal hernia begins medial to the inferior epigastric vessels, within Hesselbach's triangle; so they don't pass through the deep inguinal ring. They are occurring through weakness of posterior wall of inguinal canal⁸. There are many ways of repairing an inguinal hernia with over 80 operations techniques describe so far, the most been the mesh less repair (modified shouldice and Bassini's) and the mesh technique (modified Lichtenstein)⁹.

The open preperitoneal mesh repair of any type of inguinal hernia (in new & recurrent cases) with darning of overlying musculoaponeurotic layers by prolene sutures –reducing anatomical distortion in the inguinal canal and scar tissue, Markedly reducing the risk of damage to the testicular vessels and permits inspection of all potential groin hernia sites. Through an open incision the dissection is rapid and structures

are easily and widely visible and earlier to place a mesh by novice surgeons. Open preperitoneal mesh repair is associated with reduction in the risk of recurrence by 90% -99.99%. There is also some evidence of less pain, quicker recovery, less hospital stay, early return to normal work, cast effective, less chance of infection and recurrence as compared to other techniques of mesh repairs.

The advent of therapeutic laparoscopic surgery provided a means of entering the preperitoneal space without an open incision. The technique was adopted with widespread enthusiasm, followed by alarming reports of vessel and viscus injury, nerve damage and high recurrence rates when inadequately sized pieces of mesh were used by inexperienced surgeons¹⁰⁻¹¹.

The UK Medical Research Council study concluded that laparoscopic hernia repair had a lengthy learning curve and should be performed only by individuals who have considerable experience with technique. Furthermore the laparoscopic approach cannot be used in patients with incarcerated or large inguinoscrotal hernias, where there is extensive tissue loss (absent inguinal ligament) or patients unfit for general anaesthesia^{12,13}. The approach used in this study requires little experience to demonstrate the anatomy in inguinal canal and methodology of placing the mesh. Great care must be taken to precisely place the preperitoneal mesh particularly less recurrence rates. If surgeon has on experience in opening the posterior wall of inguinal canal and dissecting the preperitoneal space, then additional training is required before endeavor the repair.

Conclusion:

The open preperitoneal mesh repair of any type of inguinal hernia in new and recurrence cases with darning of overlying musculoaponeurotic layers by prolene sutures is highly effective in achieving less complication and low recurrence rate. It is easier to learn and safer than laparoscopic repair, and should be the procedure of choice for all groin hernias, even by novice surgeons.

Conflict of interest: None.

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