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ORIGINAL ARTICLE

Open-tension free three-dimensional Cooper ligament repair for femoral hernia

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KEYWORDS
anatomic repair;
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three-dimensional

Summary *Background:* The objective of this study was to investigate the outcome of modified three-dimensional (3D) anterior polypropylene mesh technique for recurrent inguinal and femoral hernias.
Methods: This study was designed as a prospective cohort clinical trial and 75 patients with femoral hernia and/or recurrent hernia were recruited between 2005 and 2014. Patients were operated upon using a modified 3D anterior polypropylene mesh technique.
Results: Sixty-three femoral and 12 recurrent hernias in 75 patients were treated by a single surgeon through a 9-year period using a modified 3D polypropylene mesh, fashioned by the same surgeon. Forty-six female and 29 male patients, with a mean age of 43.6 years, were evaluated for postoperative chronic pain, wound issues, and recurrences. Any complications or complaints were recorded through office visits and by telephone calls. Urinary retention in one patient and wound infections in two patients were treated within 2 weeks postoperatively. Six patients had wound swelling (2 patients with hematoma and 4 with seroma) in early term (2 weeks to 2 months) and were treated by simple drainage and compression. No chronic pain or recurrent hernia was detected.
Conclusion: Modified 3D anterior polypropylene mesh technique allows anatomical support for the potential hernia area and can be confidently applied with low morbidity and recurrence rate.

1. Introduction

Femoral hernia is the third most common type of abdominal hernia and it is not of congenital etiology. It comprises 2–8% of all the groin hernias that occur in the general population. It is more frequent in women, 20–30%, and makes up 5% of hernias in men. Femoral hernia is associated with a high incidence of incarceration and omental or intestinal necrosis, and thus it is associated with a higher morbidity and possibly mortality. An obstruction and strangulation rate of

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30–86% has been reported in the literature, and in these complicated cases, mortality rates can be as high as 10%.[1,2] Inguinal herniorraphy is still one of the most common operations in general surgery. Anatomically, the abdominal fascial wall defects are planar. However, inguinal canal anatomy is structured as a three-dimensional (3D) plane.[3,4] Since the Bassini method in 1887, many types of pure tissue repair techniques have been reported for inguinofemoral hernias.[4–7] Over recent decades, fundamental changes have developed and anterior tension-free methods have been found to be superior to the conventional tension-producing pure tissue repair techniques. Lichtenstein tension-free hernioplasty began in 1984 and evolved to an operative procedure that is now accepted as the gold standard of hernia repair by the American College of Surgeons. It is widely received and used even in recurrent cases with low recurrence rates.[7] A femoral hernia can be repaired using the classic Cooper ligament repair (McVay), posterior preperitoneal approach (open or laparoscopic), or plug mesh repair. In classical McVay repair, suturing of a conjoint tendon to the Cooper ligament is strong but creates high tension that breaks tissues and eventually results in recurrence. Therefore, various tension-free techniques have been developed using polypropylene mesh.

All the direct, indirect, and femoral hernia areas that have been explained by Hasselbach in 1814 can be treated posteriorly (open or laparoscopically). Laparoscopic preperitoneal hernia repair was documented as an excellent choice for inguinal hernia repair in numerous studies, with its short hospital stay, and low postoperative pain and recurrence rates; especially when the surgeon is experienced.[7] The costs and long learning curve are the two major disadvantages of the laparoscopic approach. The main advantages of the preperitoneal approach are mesh placement in the preperitoneal space where the hernia is produced, and avoiding the disadvantage of reoperating through scar tissue in recurrent cases.[7] Mesh plug repair is widely used nowadays but it is not favorable for potentially unidentified coincidental direct and indirect hernias.

The objective of this study was to investigate the outcome of modified 3D anterior polypropylene mesh technique for femoral hernias, as well as recurrent hernias. As such, it aimed to achieve similar outcomes to the aforementioned technique for cases in which transabdominal preperitoneal repair (TAPP)/total extraperitoneal repair (TEP) was used to close the hernia area as an alternative to Rutkow technique.

2. Patients and Methods

This study was conducted as a prospective clinical cohort trial in 75 patients between 2005 and 2014. Patients were operated upon via a modified 3D anterior polypropylene mesh technique by a single surgeon. The polypropylene mesh was fashioned three-dimensionally so that it could be sutured to both Cooper's and inguinal ligaments to close and support the femoral area, and to close direct and indirect possible hernia defects too.

Immediate postoperative (within 2 weeks) and early postoperative (within 2 months) complications after surgery were recorded at routine office visits. Patients were contacted four to five times for the first year for routine physical examination and assessed for recurrence yearly thereafter in the office if possible, or by telephone call.

3. Surgical technique

Cefazolin (1 g, intravenous) was used for antibiotic prophylaxis. Following general or regional anesthesia, an inguinal incision was made and the femoral hernia sac was dissected free, then reduced into the peritoneal cavity. A 3D mesh was fashioned using PHYSIOMESH Flexible Composite Mesh (Ethicon Inc, Somerville, New Jersey, USA) (Figure 1). The femoral hernia defect was closed by stitching the modified segment of prolene mesh with nonabsorbable polyprolene sutures to Cooper's ligament posteromedially. The mesh was laid down as a classical Lichtenstein tension-free hernioplasty approach between the inguinal ligament and the conjoint tendon. The cord structures in male patients were accommodated between the "legs" of the mesh. Figure 2 depicts the suturing area in a preperitoneal view.

4. Follow-up

After general anesthesia, patients were usually awake within 6 hours and mobile. Patients with locoregional anesthesia were also recommended to mobilize after 6 hours. All patients were discharged on the day after surgery. Follow-up visits were arranged 1 week and then 1 month after surgery, and three to four times during the first year and once a year thereafter.

5. Results

Seventy-five patients with femoral or recurrent inguinal hernias were operated upon via a modified 3D anterior polypropylene mesh technique between 2005 and 2014.

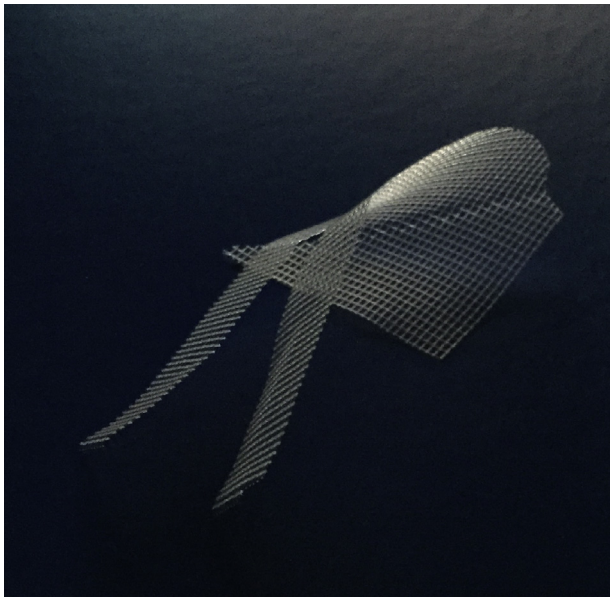

Figure 1 The surgeon fashioned mesh.

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