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Open tension free repair of inguinal hernias; the Lichtenstein technique

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Abstract

Background: Recurrences have been a significant problem following hernia repair. Prosthetic materials have been increasingly used in hernia repair to prevent recurrences. Their use has been associated with several advantages, such as less postoperative pain, rapid recovery, low recurrence rates.

Methods: In this retrospective study, 540 tension-free inguinal hernia repairs were performed between August 1994 and December 1999 in 510 patients, using a polypropylene mesh (Lichtenstein technique). The main outcome measure was early and late morbidity and especially recurrence.

Results: Inguinal hernia was indirect in 55 % of cases (297 patients), direct in 30 % (162 patients) and of the pantaloon (mixed) type in 15 % (81 patients). Mean patient age was 53.7 years (range, 18 – 85). Follow-up was completed in 407 patients (80 %) by clinical examination or phone call. The median follow-up period was 3.8 years (range, 1 – 6 years). Seroma and hematoma formation requiring drainage was observed in 6 and 2 patients, respectively, while transient testicular swelling occurred in 5 patients. We have not observed acute infection or abscess formation related to the presence of the foreign body (mesh). In two patients, however, a delayed rejection of the mesh occurred 10 months and 4 years following surgery. There was one recurrence of the hernia (in one of these patients with late mesh rejection) (recurrence rate = 0.2 %). Postoperative neuralgia was observed in 5 patients (1 %).

Conclusion: Lichtenstein tension-free mesh inguinal hernia repair is a simple, safe, comfortable, effective method, with extremely low early and late morbidity and remarkably low recurrence rate and therefore it is our preferred method for hernia repair since 1994.

Background

Recurrence following repair of inguinal hernias is a significant problem for both the surgeon and the patient. There is evidence that a defect in the metabolism of collagen is involved in the pathogenesis of inguinal hernia in adults, leading to a weakening of the transversalis fas-

cia. Obviously, the use of such a weakened tissue is problematic for hernia repair. In an attempt to reduce the incidence of recurrences and to reinforce the plastic reconstruction various techniques have been used, including autologous tissue techniques and a variety of biomaterials [1,2]. Usher proposed the use of high-density polyethylene to repair tissue defects of the chest and abdominal wall, about half a century ago [3,4]. Since that time, a clear preference for synthetics has been observed and during the last decade a marked interest in the use of prosthetic materials was evident. The reports by Stoppa et al [5] and by Lichtenstein [6], as well as the innovation of laparoscopic hernia repair [7,8], where the use of prostheses was associated with many advantages, greatly contributed to this change in our surgical philosophy. In this paper, we review our experience on tension – free surgical repair of a consecutive series of inguinal hernias using a polypropylene mesh (Lichtenstein technique).

Methods

From August 1994 through December 1999, 540 tension – free repairs of inguinal hernia were performed in 510 patients, by using a polypropylene mesh (Surgi-Pro in 95 % and Prolene in 5 %). Thirty patients had bilateral hernias. Inguinal hernia was indirect in 55 % of cases (297 patients), direct in 30 % (162 patients) and of the pantaloon (mixed) type in 15 % (81 patients). Mean patient age was 53.7 years (range, 18 – 85). All cases were performed under epidural anesthesia. Four surgeons (GHS, NK, AS and GK) participated in the study.

Operative technique

The patient is placed in the supine position. The groin is prepared in the usual fashion. Before the incision, a bolus dose of a second-generation cephalosporin is given intravenously. After incising the skin, subcutaneous tissue, and external oblique aponeurosis (as usually), the spermatic cord is elevated from the posterior wall of the inguinal canal. In indirect hernias, the hernial sac is identified, dissected to the internal ring and opened to allow examination of its contents. The sac is ligated and its distal portion is usually excised. However, in large indirect inguinal hernias, where the sac descents down to the scrotum, the distal part of the sac may be left open to prevent the formation of a hydrocele, thus allowing spontaneous obliteration. In direct hernias, we prefer to imbricate its contents with non-absorbable sutures (usually silk 2–0).

A polypropylene mesh (3 × 5 inch) is trimmed to fit the floor of the inguinal canal, and its apex is first sutured to the public tubercle using a No 3–0 Prolene suture. The same continuous suture then sutures the lower border of the mesh to the free edge of the inguinal ligament, after an opening is made into its lower edge to accommodate the spermatic cord. The continuous suture extends up just medial to the anterior superior iliac spine. Interrupted Prolene sutures then suture the two cuted edges of the mesh together around the spermatic cord. The inferomedial corner of the mesh is then attached well overlapping the pubic tubercle. The mesh is then anchored to the conjoined tendon by metal staples (titanium) or by interrupted sutures (Prolene 3–0). After meticulous hemostasis, a closed suction drain is placed beneath the external oblique aponeurosis, especially in large inguinal hernias, where an extensive dissection was performed during the plastic reconstruction. The aponeurosis of external oblique is then closed sing absorbable sutures (Vicryl No 2). Before the closure of the surgical incision, its edges are infiltrated with a long-acting local anesthetic, such as Naropein.

Regarding peri-operative care of the patient, prophylactic antibiosis is usually given for 48 – 72 hours postoperatively. In high-risk patients (i.e. obese patients), low molecular weight heparin is usually administered to prevent deep venous thrombosis the night before surgery and its administration is continued during the hospitalization of the patient. Surgery is usually performed under epidural anesthesia. The patient is mobilized about six hours after surgery. Postoperative anesthesia consists in the administration of paracetamol or NSAIDS or a combination of these too analgesics. The usual duration of the hospitalization is 2 days. When a closed suction drainage was used, it is removed the day of discharge.

Results

Postoperative pain was minimal and easily controlled by the use of single analgesics (as previously reported). In the immediate postoperative period we had 13 complications (morbidity = 2.5 %); hematoma and seroma formation, requiring drainage, were observed in two and six patients, respectively. Testicular swelling occurred in 5 patients (1 %), all of which settled. It should be emphasized that we have not observed abscess formation or acute infection related to the presence of the foreign body (mesh).

Follow-up was completed in 407 patients (80 %) by clinical examination (n = 362) or phone call (n = 45). The median follow-up period was 3.8 years (range, 1 – 6 years). In two patients we observed a delayed rejection of the mesh, 10 months and 4 years after the plastic reconstruction, respectively. This rare and interesting complication was presented by the late formation of a productive sinus at the site of the surgical incision. In both patients, a surgical debridement of this sinus tract was performed, but the fluid production continued. The mesh was then removed. Surprisingly, the mesh was almost intact in both cases, without having caused the typ-

ical inflammatory response, resulting in mesh incorporation into the host tissues; as is well known, this is considered a significant advantage of the mesh repair over the traditional methods of hernia repair. In one of these patients the hernia recurred (0.2 %). Severe postoperative neuralgia, persisting over 6 months postoperatively and requiring analgesics administration, was observed in 5 patients (1 %). Management was conservative in all cases (by using simple, non-narcotic analgesics, such as NSAIDS) and progressively settled in all cases.

Discussion

The description of the Lichtenstein tension-free mesh repair, about 16 years ago, opened a new era in groin hernia repair [6]. Postoperative pain is minimal, as a result of the tension-free technique. The method is very simple, effective, is associated with a very low recurrence rates (ranging from 0 to 2 % in the literature) and can be performed under local or regional anesthesia [9–11]. For these important advantages, it is currently the preferred method for the plastic reconstruction of inguinal hernias for the majority of surgeons around the word.

A variety of prosthetic mesh is available to the surgeon. The ideal mesh properties are inertness, resistance to infection, molecular permeability, pliability, transparency, mechanical integrity, and biocompatibility. Absorbable mesh does not remain in the wound long enough for adequate collagen to be deposited, while multi-filament mesh can harbor bacteria. Monofilament mesh is the most popular presently in use with the various types of polypropylene having different characteristic advantages [11]. Use of porous mesh (polypropylene) allows a large surface area for in-growth of connective tissue leading to permanent fixation of the prosthesis within the abdominal wall. Intraparietal placement of the prosthesis allows well vascularized, tissue coverage of all aspects of the prosthesis. Fears of complications related to mesh implantation have proved to be without foundation. The use of vacuum drains is indicated in large inguinal hernias in order to minimize hematoma or seroma formation. However, duration of antibiotic use or indication for suction drainage differ among investigators.

To reduce the chance of recurrence, the mesh should extent 2 – 4 cm beyond the boundary of Hesselbach's triangle [10]. The position of the mesh beneath the aponeurosis of the external oblique results in the intraabdominal pressure working in favor of the repair, since the external oblique aponeurosis keeps the mesh tightly in place by acting as an external support when intraabdominal pressure rises. The mesh should be fixated carefully, by the use of Prolene sutures or staples, to prevent folding, wrinkling, or curling of the mesh around the cord.

The method is simple, can be performed by all the surgeons – even those without special interest in hernia surgery – and is very effective in the prevention of recurrences. Indeed, an extremely low recurrence rate (range, 0 – 0.7 %) has been reported from many groups of surgeons [9,12–14]. The method combines many advantages, such as simplicity, effectiveness, safety, comfortable postoperative course with easily controlled pain, rapid return to unrestricted activities, an impressively low recurrence rate and high patient satisfaction. We have been encouraged by these good results of this procedure in a relatively large number of patients (n = 540). For these reasons, it is our preferred method for hernia repair since 1994.

Competing interests

None declared.

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