

Postoperative pain and surgical time in Inguinal hernia repair with self-gripping mesh: Experience in ambulatory surgery

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Abstract

Aim: To Current best practice in surgery for abdominal wall hernias involves minimal trauma to the tissues using modern low molecular weight mesh to achieve a low incidence of mesh complications such as chronic groin pain or the sensation of an inflexible 'mesh plate'.

Objective: A retrospective audit of inguinal hernia repair with a new self-adhesive mesh (Progrip®) in patients undergoing ambulatory surgery.

Material and Methods: Fifty patients were randomised to self-adhesive mesh repair or conventional mesh repair between January 2009 and January 2010. All patients were treated as day case procedures. Surgical operating time was compared with other

techniques in open inguinal hernia repair in our hernia service.

Results: There were 50 open hernioplasty with plug and mesh technique (Rutkow-Robbins). *Surgery time:* mean 28.6 minutes (range 10-50). Pain scores on a visual analogue scale of 1-10 were low (2.1 postoperatively and 0 at 6 months and one year. Other mesh techniques used had an operating time ranging between 34 and 45 minutes. Physical examination one month after the intervention reported no signs of recurrence, seroma, or infection or all of the patients.

Conclusions: The use of self-adhesive mesh hernioplasty provides an effective technique, with the same complication profile as conventional suture fixation but with a reduced operating time.

Keywords: hernia, self-adhesion, ambulatory surgery.

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Introduction

Currently techniques for inguinal hernia repair involve the use of prosthetic non-absorbable or partially absorbable mesh and fixation with absorbable or non-absorbable sutures.

Available mesh includes standard polypropylene mesh (polypropylene heavy-normal: 120-100 kD), partially resorbable mesh (lightweight, low molecular weight: <82 kD and usually with large pore), composite mesh (composites) and fully absorbable mesh.

Fixation of mesh now includes absorbable sutures, biological glues and self-fixing systems (Progrip® Sofradim Parietene®, Covidien Group, Trévoux, France). These latter techniques do not require suturing and offer a potential reduction in overall operating time. Minimal dissection could also reduce potential damage to the ilio-inguinal nerve, the genital branch of the genito-femoral nerve and the ilio-hypogastric nerve which may reduce the incidence of chronic pain due to nerve damage or chronic inflammation.

Materials and methods

This study was performed at the Department of General and Digestive Surgery of the Riotinto Basic General Hospital (hospital district), serving a population of about 75,000 habitants with a total of 120 beds.

Patients

Fifty patients with unilateral primary inguinal herniae (aged 16-90 years with Gilbert type I and II, type LP1 and LP2 EHS) were randomized to a Rutkow-Robbins repair with absorbable plug (n=25) or to nonabsorbable plug + Progrip® self-adhesive mesh (n=25). Randomisation was by alternate allocation of the first patient on the operating list to each study group. The operating surgeon was uninvolved in the technique selected for the patient.

The average age of patients was 55.6 years and included 43 males and 7 females. The mean body mass index (BMI) was 26.8, range 20-35. Two patients underwent general anaesthesia, 32 spinal anaesthesia and 16 received local anaesthetic infiltration with sedation.

The pre-operative physical activity of patients was assessed as a) Retired: 10 patients, b) Active Living (moderate-high physical activity): 35 patients, c) Sedentary lifestyle (low physical activity): 5 patients.

Patient co-morbidity was:

- Respiratory (n=12)
- Cardiovascular (n=10)
- Digestive (n=2)
- Oncology (n=2)

Monitoring and Measurement postoperative pain

All patients were interviewed regarding preoperative discomfort and again assessed at discharge, at one month and at 6 months post-operatively. Physical examination was also conducted at these intervals to specifically assess for seroma, haematoma or signs of recurrence.

A visual analogue scale (VAS) was employed where 0 was the lowest level (no pain) and 10 the highest.

Finally, one year after surgery patients were interviewed regarding the overall satisfaction with their surgery.

Type of mesh

The mesh utilised in this study was Parietene® Progrid® (Sofradim, Group Covidien, Trévoux, France) and is available in three formats. Two of them were of elliptical shape, specially designed to fit the anatomy of the inguinal region, with a self-adhesive flap adjustable around the cord, either left or right. The third variant is a flat plate 15x9 cm. The mesh itself is partially absorbable and of low molecular weight polypropylene monofilament composed of polylactic acid (absorbable).

Attachment of the mesh is by a large number of polylactic acid hooks in a format not unlike 'velcro' mesh to ensure adequate fixation to the tissues (Figure 1).



Figure 1: Self-gripping lightweight mesh Progrid® for inguinal hernia repair.

Surgical technique

The hernial defect is identified and the sac reduced. Using the Rutkow-Robbins technique, the defect is repaired with a plug of polypropylene or absorbable material (PGA-TMC), fixed with conventional sutures (polypropylene or absorbable to match the plug material), and Progrid® self-adhesive mesh placed to ensure contact with the surface of the pubis, conjoint tendon and inguinal ligament, without any folding of the mesh. (Figure 2.)

The mean operating time using this technique was compared to a control group using Lichtenstein or PHS / UHS .

Results

The mean operating time in open surgery of inguinal hernia with this new prosthesis was 20.6 minutes (range 10–50) .

The mean time to repair the control group ranged between 34 and 45 minutes. (Lichtenstein: mean 44 mins; Rutkow-Robbins: mean 37 mins; PHS/UHS: mean 33 mins). (Figure 3)

No intra-operative nor immediate post-operative complications were recorded. Patients were all discharged the same day.



Figure 2: Surgery: inguinal hernioplasty using the self-gripping lightweight mesh.

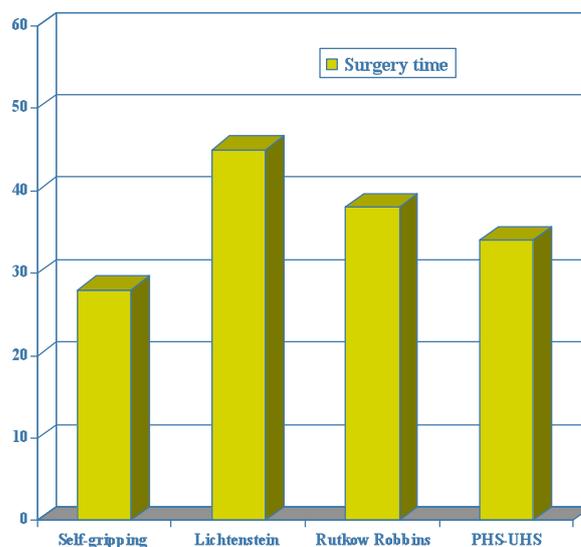


Figure 3: The mean time in inguinal open hernia repair.

Analgesia consisted of intravenous paracetamol and metamizole intravenously if pain or discomfort. Low molecular weight heparin was given to all patients.

At discharge, all patients received a prescription at for postoperative analgesics: Dexketoprofen-trometamol 25 mg orally every 8 hours and Acetaminophen 500 mg orally every 8 hours if excessive pain or discomfort for the first 5 post-operative days.

All patients received thromboprophylaxis with bemiparin (3500UI subcutaneously) for seven days.

All patients were followed-up for 12 months. At physical examination at 6 months and 12 months there was no evidence of recurrence, seroma or infection in any patient.

Postoperative pain at one month, 6 months and one year after surgery was as follows (Figure 4):

- VAS (visual analogue scale for pain assessment): mean and range.
- preoperative VAS: 4.8 (8-0)
- postoperative VAS: 2.1 (5-0)
- VAS 1 month: 0.72 (2-0)
- VAS 6 months: 0
- VAS 1 year: 0

There was no difference when comparing the groups using self-gripping mesh and absorbable plug (25 patients) versus nonabsorbable plug (25 patients). (p=0 with Willcoxon test in SPSS 14.0).

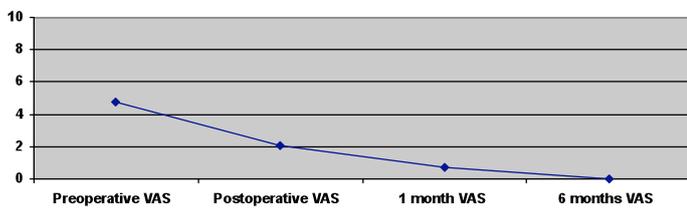


Figure 4: Results of the visual analogue scale (VAS).

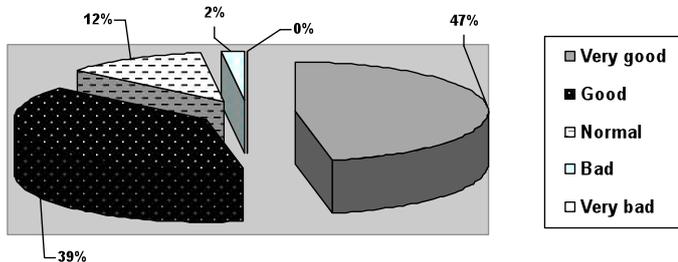


Figure 5: Satisfaction result.

Overall satisfaction with the results: very good (47%) Good (39%) Average (12%) Poor (2%) Very bad (0%). (Figure 5)

Conclusions

Self-adhesive mesh hernioplasty is an effective technique, with a similar profile to conventional mesh repair regarding post operative pain, recurrence at one year and post-operative complications. There

Figure 1: Self-gripping lightweight mesh Progrid® for inguinal hernia repair.

does, however appear to be an advantage with self-adhesive mesh regarding a shorter operating time.

Discussion

Many operative techniques have been used for inguinal hernia repair since Bassini's original technique was published. [1] Today the Lichtenstein repair remains the 'gold standard' [2]. As most inguinal hernia repairs are now performed on a day-case basis, it is essential that any innovation in prosthetic mesh ensures comparative outcomes with accepted techniques. [3,4]. In this context we decided to conduct this study and test our results with this innovative technology.

The plug-and-patch repair is a popular method of herniorrhaphy. It is a quick procedure and is relatively easily learned but there may be significant numbers of patients who experience prolonged pain after this operation. [5] In contrast, self adhesive meshes may be associated with less post-operative pain. Chastan [6] reported a series of 52 patients between 14 and 52 years, who underwent open inguinal hernia repair with this new prosthesis. Preliminary results published describe advantages of this new self-adhesive prosthesis: a significant reduction in operating time to 19 minutes on average, and most importantly, a marked reduction in postoperative pain (1.2-1.3 in postoperative VAS) with the rapid incorporation of patients to their daily activities (5.5 ± 3.6 days) [6].

Bruna's experience would appear to be similar to our own [7] with a significant decrease in operating time and ease of technique. While short term post-operative pain in the first week is low, no longer term results were reported. In our series the results are evaluated in several periods up to one year without chronic pain in any patient. [7]

Kapischke [8] reports a similar experience Bruna [7], but with fewer patients in a 6 month follow-up.

With regard to experimental studies in rats, Hollinsky [9] found no differences in integration of material or foreign body reaction. Kolbe did not find any impaired fertility of male rats after placing the mesh in contact with the vas deferens suggesting that the integration of the mesh does not affect the surrounding tissues. [10]

García Ureña reported a multicentric observational study of pain after the use of self-gripping lightweight mesh with a total of 256 patients. The mean operative time was 35.6 min and 76.2% of patients were operated in an ambulatory setting. There were a few postoperative complications: 2 wound infections, 17 seromas, 21 hematomas, 6 orchitis. The incidence of acute pain was 27.3% at week 1 and 7.5% at month 1. The incidence of chronic pain was 3.6% at month 3 and 2.8% at month 6. No recurrences or long-term complications were observed. [11]

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