Hernioplasty in One-Day Surgery: result of 228 self-adhesive prosthesis

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Abstract

Aim: To evaluate the outcomes of inguinal hernia repair with ProGrip® mesh in same-day surgery

Methods: Follow-up data was collected at 24 hours and 30 days after surgery.

Results: In one year, 228 patients underwent surgical repair of unilateral inguinal hernia. At 24 hours after surgery, 50.64% of patients reported some degree of pain and 66.3% were able to move around the house with few limitations. Thirty days after surgery, 94.39% of patients had returned to their routine activities.

Conclusions: The use of the ProGrip® mesh is associated with low post-operative pain and rapid recovery.

Keywords: Inguinal hernia repair; day case; ambulatory surgery.

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Introduction

Surgery for inguinal herniae was first attributed to Erasistratus of Keos in the third century. In those days, surgery was based on techniques which often led to genital mutilation1 with unconvincing outcomes. In 1884, Edoardo Bassini described the first herniorrhaphy technique with satisfactory results (recurrence of 2.3% in surgeries performed by Bassini vs 3.2–10% for surgeries performed in other surgical centers) [1, 2] and, subsequently, other similar techniques appeared: Halsted II, Ferguson, Andrews and McVay.2 In 1952, Shouldice, Obney and Ryan described a different technique for hernia repair, thus reducing the recurrence rate associated with Bassini's method of (0.7% -1.7% in clinics vs 1.7-15% for overall practice). [1, 2]

The introduction of prosthesis for surgical repair of inguinal hernias was first performed by Usher in 1958.[3] However, it was Lichtenstein who, in 1986, applied the tension-free concept for inguinal hernia surgery, describing a technique that would reduce the recurrence rate associated with the tension of the herniorrhaphy suture.[1] In subsequent years, other hernioplasty techniques emerged using various types of prosthesis and/or other approaches in the groin. Despite the development of other techniques, the Lichtenstein hernioplasty remains the method of choice in the anterior approach of inguinal hernias.[4]

In 2007, the ProGrip® system was introduced (Covidien, Trévoux, France), consisting of a monofilament polyester semi-absorbable and monofilament absorbable polylactic acid which adheres to the tissues of the floor of the inguinal canal without fixing points.[3]

Currently, the goldstandard treatment for unilateral inguinal non-recurrent hernia in the adult is an open surgery approach, performed under local anesthesia as a day case.[3]

The introduction of synthetic prosthesis in inguinal hernia surgery created the new problem of chronic pain syndrome after hernioplasty (presence of pain that persists more than 3 months).[5] A systematic review from 2008, which included studies of postoperative pain, showed that the incidence of this syndrome is very variable (0-53%). An explanation for this discrepancy is the lack of validity and accuracy of scales used to assess postoperative pain.[6] The pathophysiology of this syndrome is controversial, but appears to be due to stiffness in the groin by the use of heavy meshes, injury of the inguinal nerves during surgery and inguinal nerve irritation by scar tissue.[5]

In the few published series of the use of self-adhesive prosthesis, numbers are small (between 24 and 70) but showa promising trend that these prostheses have a beneficial effect on postoperative pain and decrease the operative time (average total surgical time between 18–51 minutes) without increasing the rate of surgical complications and relapses.[5, 7,8]

In this study, the authors aimed to evaluate the surgical outcomes (operative time, functional recovery of patients, chronic pain and recurrence of the hernia) of inguinal hernia repair with the use of self-adhesive ProGrip® prosthesis in day surgery.

Methods

A prospective observational study of patients undergoing inguinal hernia repair with ProGrip® mesh in one day surgery was conducted at Hospital de Braga between January 1 and December 31, 2010.

Patients were selected for one day surgery using the criteria set by the Department of Ambulatory Surgery at the Hospital de Braga:

a. Being older than 5 years
b. Being accompanied by a responsible adult, who can be with the patient from discharge from the hospital until at least 24 hours after surgery
c. Having transportation provided
d. Having a phone / mobile to contact the Ambulatory Surgery Unit if necessary
e. Having adequate logistical conditions at home

f. No more than 60 minutes time between the patient's home and Hospital de Braga

g. Expected duration of the intervention less than 120 minutes

The inclusion criteria for this study were:

a. Patients undergoing unilateral hernioplasty with self-adhesive ProGrip® mesh

b. Surgery performed by the group responsible for Ambulatory Surgery in the Department of General Surgery, Hospital de Braga

Patients were evaluated preoperatively by the surgeon, the anesthesiologist and nurse of the Ambulatory Surgery Unit. Each patient was provided with written pre and post operative instructions regarding their day case admission.

After each operation, the Ambulatory Surgery Group collected the relevant data which was entered into a database, using the software Microsoft Office Excel®.

Patients were contacted by telephone by the Nurse of the Department of Ambulatory Surgery at 24 hours and 30 days after surgery, and a questionnaire, inquiring about pain or other complications, and evaluating the degree of functional recovery was completed. All patients were also recalled for a postoperative consultation with the operating surgeon between 30 and 60 days post-surgery.

Surgical Procedure

Most patients underwent surgery under local anesthesia (10ml of lidocaine 2% and 10ml of ropivacaine 7.5% infiltrated 1 to 2 cm medial to anterior superior iliac spine, above the pubic tubercle and along the route of surgical incision) with sedation controlled by the anesthesiologist. However, some patients were operated under general anesthesia. Although controversial, the literature recommends the use of antibiotic prophylaxis, [9] so all patients received prophylactic cefazolin 2gr, before the incision.

The surgery was performed according to the method of Lichtenstein, with care not to injure the ilio-inguinal and ilio-hypogastric nerves. In patients where a weakness of Transversalis Fascia was observed, a placating continuous suture of absorbable polyglactin was inserted (usually Vicryl® 2/0). The ProGrip® mesh was placed on the public tubercle and then around the spermatic cord followed by refashioning of the external oblique aponeurosis .

Outcome and statistical analysis

The data used in this study was taken from the database of the Group of Ambulatory Surgery recorded on the day of operation, from the telephone questionnaires at 24 and 30 days postoperatively and the records of the postoperative surgical consultation.

Results

Two hundred and forty-seven patients underwent surgical repair of unilateral inguinal hernia by the Ambulatory Surgery Group of the Department of General Surgery between January 1 to December 31, 2010 at the Hospital de Braga. Of these patients, 228 underwent hernioplasty with ProGrip® mesh (Covidien, Trévoux, France), seven hernioplasty with 3-D® mesh (Ethicon, Auneau, France), two hernioplasty according to Lichtenstein's original method with polypropylene Premilene® Mesh (B. Braun Melsungen AG, Melsungen, Germany), three inguinal prosthesis Premilene® Mesh Plug (B. Braun Melsungen AG, Melsungen, Germany), two hernioplasty with Adhesix® mesh (Cousin Biotech, Wervicq-Sud France) and five to inguinal hernia repair (by Marcy technique).

Demographic characteristics of 228 patients included in this study are presented in Table 1 and results of inguinal hernioplasty are presented in Table 2.

Table 1 Demographic data.

No. patients (no. hernioplasty)	**228**
Age (years), average	54.47 (min 17, max 83)
Sex - Male vs Female	197 vs 31
Weight (kilograms), average	73.3 (min 42; max 110)
Height (meters), average	1.68 (min 1.35; max 1.90)
Body mass index (kg/m^2), average	26.02 (min 18.18; max 37.11)
ASA	
ASA I (No.; %)	118 (51.75%)
ASAII (No.; %)	106 (46.49%)
ASAIII (No.; %)	4 (1.75%)

Clinical indicators on the day of the surgery

On average, surgical time (time between the start of disinfection of the surgical area and the completion of wound closure) was 32 minutes and 49 seconds (minimum of 11 minutes and maximum 68 minutes).

Despite being a condition that, a priori, does not justify overnight stay, 8 patients (3.51%) required overnight stay at the Ambulatory Surgery Unit, being discharged in less than 24 hours. This group of patients had a higher mean of age than the overall average (mean 70 years) and higher operative risk (ASA I 37.5%, ASA II 50.0%, ASA III 12.5%). No patient required further medical or surgical approaches, and only stayed overnight by recommendation of the pre-operative surgical and/or anesthetic consultation. Only one patient required non-scheduled overnight stay because he developed transient paraesthesia in the left leg. There were no readmissions after surgery.

Clinical indicators after the first 24 hours

One of the main clinical indicators after the first postoperative day was the patient's comments in the first 24 hours. In our study, just over half of patients (50.64%) reported complications by telephone interview: all reported pain in the surgical incision and 2% also reported nausea/vomiting.

With regard to analgesia, almost 87% required administration of prescribed medication but 97% stated that it was enough to control symptoms. Only one patient (0.76%) needed additional medication.

The degree of functional activity 24 hours after surgery was as follows: most patients (66.23%) reported being able to move around the house with some limitations, whereas only 3.89% of patients admitted to an inability to perform any activities at all.

Clinical indicators at 30 days

The percentage of patients with complications observed at the postoperative consultation with the surgeon was 18.18%; these consisted of the minor complications of persistent pain on the surgical incision after 30 days (9.09%), seroma/surgical wound infection (4.55%), pricking sensation in the surgical incision which persisted after 30 days (2.73%) and wound hematoma (1.82%).

In the survey made by phone after the first month after surgery, 83% of patients reported having required analgesic medication for

Table 2 Results of one day surgery.

Surgery	Results of 228 patients(100%)
Surgeon - Specialist vs resident	96 vs 132
Surgery time (minutes)	32m49s (min 11m; max 68m)
Overnight stay on the Ambulatory Surgery Unit	3.51%
Surgical risk assessment	
POSSUM - expected morbidity	11.23%
POSSUM - expected mortality	2.04%
Surgical APGAR	8.34 (min 5; max 10)
24 hours	Results of 154 surveys (67.5%)
Complications 24 hours after surgery	50.64%
- Pain in surgical incision	- 50.64%
- Nausea/vomiting	- 1.95%
Analgesia required	89.61%
Grade of functional activity	
Cannot do anything	3.89%
Only personal hygiene	7.79%
Moves around the house, with limitations	66.23%
Moves around the house, without limitations	9.74%
No functional limitation	12.34%
30 days	Results of 110 surveys (48.2%)
Complications of surgery (during the first 30 days)	18.18%
- Pricking sensation in the surgical incision to 30 days	2.73%
- Pain on surgical incision at 30 days	9.09%
- Haematoma	1.82%
- Seroma/Infection	4.55%
Chronic pain (> 3 months)	7.27%
Recurrence	2.73%
Required analgesic medication	82.57%
- During how many days, average	5.65 (min 1; max 15)
Required to use Health Services	6.37%
- Unplanned hospitalization	0.91%
Resumed normal activities of daily living at 30 days	94.39%
Number of days, average	10.94 (min 1; max 31)

5 to 6 days on average (minimum of 1 day and 15 days). In addition to wound care and suture removal in the Health Centre, and the visit to the hospital for consultation after surgery, 6.37% of patients required use of health services for post-operative complications. Only one patient needed to be hospitalized for extensive hematoma on groin and genitalia that appeared five days after surgery. This patient was on oral anticoagulants and, despite having suspended the drug as indicated by the Department of Immuno-Hematology and careful hemostasis during surgery, a hematoma occurred.

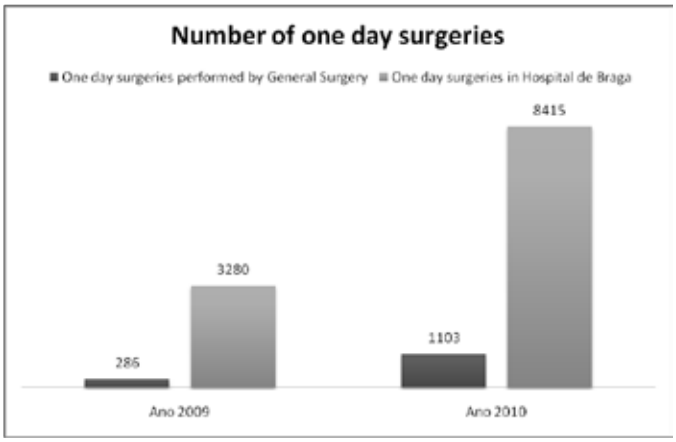
One of the most important indicators in this type of surgery is the ability to resume daily life activities. In relation to this, after one month, 94% of patients reported to have already resumed their normal activities, on average after 11 days (minimum 1 day and up to 31 days).

Two other important indicators in the evaluation of inguinal hernia repair in day surgery are recurrent herniae and chronic pain. Only 2.73% (3 patients) had recurrences, two were inguinal and one patient was female and had a femoral recurrence. In relation to chronic pain, patients who complained of pain at the incision site after one month were contacted again and the percentage of chronic pain was 7.27%. Despite an assessment of the severity of pain not having been conducted, nearly half of patients who reported it complained of pain only in recurrent situations of intense/violent physical efforts.

Discussion

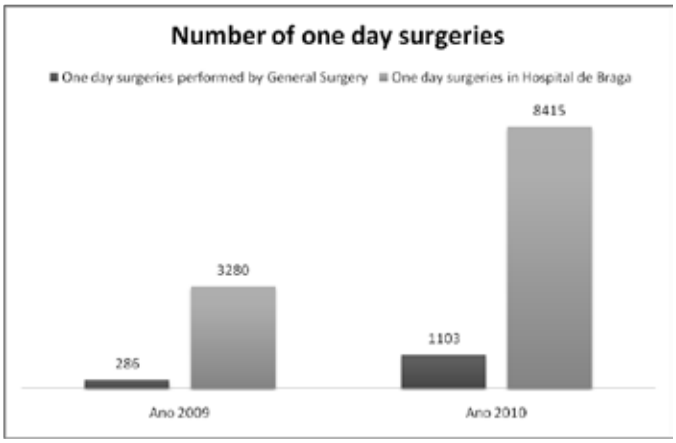
In recent years, ambulatory surgery has rapidly expanded in the Hospital de Braga . The number of procedures performed in outpatients increased 157% between 2009 and 2010 and the number of procedures performed in the general surgery ambulatory unit increased by 286% over the same period of time (Figure 1).

Figure 1



One of the most frequent operations in general surgery in the Ambulatory Surgery Unit is inguinal hernia, accounting for about 30% of surgical interventions. The number inguinal hernia repairs also accompanied the growth of the Ambulatory Surgery Unit, increasing 256% between 2009 and 2010 (Figure 2). Associated with this increase in the number of inguinal hernia repairs in one day surgery is the use of self-adhesive ProGrip® mesh on the Ambulatory Surgery Unit of Hospital de Braga.

Figure 2



The activity of an Ambulatory Surgery Unit can be evaluated by several clinical indicators of the day of surgery, the first day after surgery and postoperative recovery. [10] The results of our study show that use of the ProGrip® mesh allows hernioplasty to be performed in a short time (32m49s, on average), with low levels of pain (only 50.64% had pain in the first 24 hours) and without major limitations in the immediate postoperative period (66.23% of patients moved around house), with low complication (18.18%), chronic pain (7.27%) and recurrence (2.73%) rates and earlier return to normal daily life activities (94% returned the first month, on average 11 days postoperatively).

Although the percentage of patients with postoperative complications may be slightly higher than predicted by POSSUM (18.18% observed vs 11.23% expected), the majority of these complications are considered to be minor. The percentage of haematoma (1.82%) and seroma/infection (4.55%) in our centre is similar to a recently published study regarding hernioplasty with ProGrip® mesh (hematoma 2.2%, seroma/infection 2.2 %).8 This study showed an overall morbidity of 15.4%, not accounting, however, with the rate of persistent pain after 30 days. If we don't count the rate of persistent pain/stinging after 30 days, the rate of postoperative complications in our study would decrease to 6.37%.

The Ambulatory Surgery Unit of Hospital de Braga is involved in the training of General Surgery Residents as can be seen in the main surgeon specialist/resident ratio (96 vs 132, respectively).

The monitoring of patients post-operatively and one month after surgery by the Ambulatory Surgery Team (surgeon and nurse) is essential for early detection of postoperative complications, provides reassurance to the patient in the first 24 hours at home and monitors the quality indicators of the Ambulatory Surgery Unit.

Conclusion

The unilateral inguinal hernia surgery with the ProGrip® mesh in one day surgery is a safe and easily performed technique with low rate of recurrence and chronic pain.

Conflict of Interest:

No conflict of interest.

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