



Trabucco's 'suture-less tension-free' hernia repair: technique, local anesthesia and results

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Received 5 October 1998; accepted 28 November 1998

Abstract

Hernia repair has always been performed by approximation of the inguino-crural structures. Since these structures are not normally in apposition, their approximation may be associated with undue tension on the suture line: this can cause recurrences. 'Tension-free' techniques solved this problem, and permit a remarkable reduction in recurrence rate. © 1999 Elsevier Science B.V. All rights reserved.

Keywords: Hernioplasty; Local anesthesia; Polypropylene mesh; Recurrences

1. Introduction

There is histological and biochemical evidence that inguinal hernias can be caused by a metabolic disorder involving collagen turnover of the transversalis fascia [2–4].

The use of synthetic material in the repair of hernias seems a more logical approach.

Biomaterial can permanently replace the defective transversalis fascia and permit the creation of a true tension-free hernioplasty. Polypropylene mesh has proved to be the most suitable synthetic mesh, achieving four major objectives: no rejection, no infection, early fixation and host tissue incorporation. Trabucco's technique is suitable for treatment of hernias under local anesthesia in the outpatient department or on a short-stay or day surgery basis.

2. Materials, methods and results

From March 1992 to March 1998, in the first Department of General and Emergency Surgery of S.M. della Misericordia Hospital (Udine, Italy), we per-

formed 1416 Trabucco's tension-free sutureless hernioplasty operations in 1325 patients (male, 91.5%; female, 8.5%; mean age, 59.3 years, range 18–92). The hernias were: primary, 95.5%; recurrent, 4.5%; indirect, 58.5%; direct, 40.3%; congenital, 1.2%; bilateral, 6.9%.

The patients were admitted to hospital on the previous day or on the morning of the operation. In the latter case, they underwent pre-operative tests on an outpatient basis. We administered routinely local anesthesia (Table 1), regardless of the setting (emergency versus planned), using a buffered anesthetic solution (bupivacaine 0.50% 20 ml + xylocaine 0.2% 20 ml + sodium bicarbonate 8.4% 10 ml + isotonic sodium chloride solution 40 ml). Our technique consists in a locoregional approach based on anesthesia of the ileohypogastric and ileoinguinalis nerves in association with step-by-step infiltration of the oblique or transverse incision line.

Table 1
Methods of anesthesia employed

Anesthesia	%
Local	93.0
General	3.0
Spinal	3.5
Conversion (to general)	0.5

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Peculiar elements of Trabucco's technique are: (1) indirect inguinal hernias: dissection of the sac without opening it, if possible. Introflexion of the sac in the deep ring followed by a plug. (2) Direct inguinal hernias: dissection and invagination of the direct sac with or without placement of a plug. (3) Implant of the preshaped mesh over the posterior wall of the inguinal canal. (4) Suture of the external oblique aponeurosis over the preshaped mesh medially and laterally to the spermatic cord which remains in a subcutaneous position.

For mesh and plug we use monofilament polypropylene of surgical quality and controlled memory produced by Herniamesh.

The post-operative complications were: scrotal oedema, 0.9%; collection of serous fluid, 2.1%; hematoma, 0.8%; partial reopening of the wound, 1%; bacterial dermo-epidermitis (healed within 90 days without removal of the prosthesis), 0.07%. The only intraoperative complication observed was inconsequential vagotonic reaction (bradycardia) treated with atropine, 0.9%. The long-term complications were: long-lasting (2 months) inguinal neuralgia, 0.6%; and testis atrophy, 0.1%. Recurrence rate was 0.3%, and the mean hospital stay was 2.1 days.

3. Discussion

The results of the traditional surgical techniques of hernia repair, based on the direct reconstruction of the wall (Bassini, McVay, Shouldice), cannot be considered excellent. In fact, the recurrence rate may be very high (10–15%) [4,6]. Lichtenstein identified, as the principal factor for recurrence, the tension on the suture line, due to the bringing together anatomical structures usually distant. In nearly 90% of the cases, the recurrence is located in the extreme points of the repair, where the tension is greater (pubic tubercle and deep inguinal ring) [4,5]. This mechanism is the basis of the 'mechanic' recurrences, that usually occur within 2 years of the operation [5].

Alterations of collagen metabolism (decrease of hydroxyproline contents, decrease of insoluble polymeric component, total decrease of synthesis, decrease of the $\alpha 1$ [I]/ $\alpha 1$ [III] ratio), causing a real weakness of aponeurosis and fibrous structures [2] that predisposes to recurrence, are seen in patients with hernias. In fact, patients with collagen diseases (Marfan's disease, Ehlers–Danlos' syndrome, osteogenesis imperfecta) are very frequently affected [2]. The intrinsic tissue weakness of the wall can explain late recurrences, called 'metabolic', that appear even many years after the operation [5].

The use of prosthetic synthetic nets allows a reconstruction without any tension of the normal anatomical structures and a real strengthening of the wall [3,4,6–8].

Of the prosthetic materials, Marlex (polypropylene) shows the best features, because it is strong, inert, easily available and very resistant to infections [4]. Because of its thin and porous structure, it is completely penetrated by fibroblasts [3,4] and, by inducing an intense inflammatory reaction, stimulates collagen synthesis [2]. The result in time is a solid fibrous coat that effectively strengthens the inguinal wall.

With his 'tension-free' hernioplasty, Lichtenstein [4] obtained excellent results, with a recurrence rate not higher than 0.1% [1], and stimulated many surgeons to use the technique and try to improve it.

The Trabucco 'sutureless' operation [8] represents a technical evolution, because it avoids neuralgias due to the trapping of sensory nerves and removes the tension: in addition it is a quicker operation.

Reconstruction without tension of the wall does not require post-operative immobilization and generally does not necessitate any analgic functional limitation [3,4,6,8]: it permits a very fast restoration of full physical and working activity by the patient, with clear personal and social savings and a lower cost to the community. The use of local anesthesia reduces general and local complications. Moreover the conscious patient can perform Valsalva's manoeuvre or cough to evidence unknown hernias or immediately verify the effectiveness of the reconstruction.

We started performing Trabucco's sutureless hernioplasty in March 1992 under general anaesthesia. After suitable training we changed to local anaesthesia that we now use routinely.

Among this technique's advantages we would emphasize the virtual absence of post-operative pain, the effective very fast recovery of normal working activity by our patients, and the excellent Marlex resistance to infections.

4. Conclusions

Inguinocrural hernioplasty is one of the most common operations in general surgery. In the past Bassini's techniques gave us good results but not complete satisfaction, due to the high recurrence rate. For this reason we began to study the problem with the specific goal of improving our approach to hernia pathology. We started performing Trabucco's tension-free sutureless hernioplasty under local anesthesia 6 years ago. A total of 1416 operations have been performed with a low number of recurrences (0.3%) and without any major complications. This procedure has the benefits of very low recurrence rates, absence of complications and of post-operative pain, immediate normal ambulation and good social impact (decreasing costs, faster recovery of working activity).

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