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Tension-free hernioplasty: stop and go ambulatory technique

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Abstract

The appearance of the mesh prosthesis on the market determined radical changes in the treatment of groin hernia. There had been no substantial variations for over a century since the invention of Bassini's technique in 1877. The 'tension-free' hernioplasty makes the operation easy; it allows the use of local anesthesia and it lowers remarkably the chance of recurrence and complications. In this work the authors, with experience in herniorrhaphy according to Trabucco, illustrate the technique they use to perform the operation in an office-based surgical suite. Moreover, they explain how they eliminate the risk of recurrence that immediate mobilization of the patient and consequent movement of the prosthesis or creation of seroma may cause. In order to avoid these risks, the authors fix the polypropylene prosthesis with human fibrin spray glue. The patients are selected according to their psycho-social characteristics and the operating risk according to the classification of the American Society of Anesthesiology (ASA). They are informed in detail of the method, are treated in an ambulatory fashion, being hospitalized for 2 h on average, are sent home with an analgesic prescription for 24 h and a phone number to use in case of complications. The authors started this method in January 1996 and have treated six patients so far, aged between 23 and 69. The results, although limited and preliminary, have demonstrated the feasibility of the technique, the very good compliance of the patients, the lack of both immediate and belated complications, and the validity of the method regardless of age.

A reassuring fact that has been noticed by examining the forms for pain evaluation is the remarkable reduction of pain after the operation compared with patients treated with the traditional Trabucco technique. This fact may be due both to the better preparation of the patients and to the lower mechanical stimulus from the plug covered with fibrin glue.

Keywords: Anesthesia; Groin hernia; Hernioplasty; Mesh prosthesis

1. Introduction

Groin hernias represent one of the most common pathologies in general surgery. Their frequency has been increasing with the rise in life expectancy. After over a century since the first herniorrhaphy was performed by Bassini, many surgical techniques have tried to reduce the number of recurrences, which range from 10 to 25% [1,2], the duration of stay in hospital and the convalescence time after the operation. In the 1950s, herniorrhaphy underwent radical changes due to the appearance of the mesh prosthesis. This prosthesis was used by Rives and Stoppa first and, later, by Liechtenstein, Trabucco and Gilbert, who initiated the 'tension-free' philosophy, the concept of '1-day surgery' and an increasing use of local anesthesia. These authors' techniques have had great success because of their effectiveness, the simplicity of execution and the scarcity of complications, together with a recurrence rate below 1% [3–5].

In our division of General Surgery we adopted the tension-free Trabucco technique in August 1991, liking its conceptual effectiveness and its simplicity, completely neglecting Bassini's technique that we had formerly used in almost all cases. To date, 489 operations have been performed using Trabucco's technique (455 males, 35 females; 461 elective and 28 as emergencies). The average age of the patients was 57.9 years (range: 6–92 years) (Table 1).

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In 18 cases the operation was bilateral and in 24 cases we found different kinds of hernia together. In 51 cases the operation was performed under general anesthesia, in 25 cases with epidural anesthesia, in 192 cases with spinal anesthesia and in 221 cases under local anesthesia. The average stay in hospital of the patients after the operation was 1.7 days for those operated under local anesthesia, slightly lower than for the patients operated under spinal anesthesia (2.1 days), but definitely better than the ones who underwent epidural anesthesia (5.7 days) or general anesthesia (7.8 days) (Table 2).

Follow-up has been done on all the patients, with check-ups after 1 month, 6 months and then yearly, with a 70% compliance, and only one recurrence was noted. Another case, which was initially classified as a recurrence, was identified as a crural hernia at the time of the operation. Satisfied with the results, we thought of lowering the stay in hospital to zero days, performing the operation on an ambulatory basis in order to optimize the results both from the economic and organizational points of view for the hospital and from the psychophysical point of view for the patient.

In order to do so we have prepared a technique, called 'stop and go', which, after a careful selection of the patients, allows us to perform herniorrhaphy on an ambulatory basis, allowing the patient to stay in the hospital for an average of only 2 h.

2. Materials and methods

In January 1996 we started selecting patients with groin hernia, in order to submit them to the stop and go operation. The selection is done according to the ASA class of risk, enrolling the ASA 1 and ASA 2 patients and hospitalizing the others. Another important factor is the social and psychological condition of the patient, who is informed in detail and has to accept the method. Exclusion criteria are obesity, a multirecurrent or huge hernia, allergy to local anesthetic, distance from the hospital (> 90 min) and poor or no family support (Table 3).

We have enrolled six patients so far, aged between 23 and 69 years. After having undergone clinical and hematochemical examinations and after having being evaluated by the anesthetist, the patient, on the day of the operation, arrives in the hospital where he is prepared for the operation in a room next to the operating room. He walks to the operating room, lies down and, while informed of what is happening, undergoes the operation.

Local anesthesia is carried out in different stages with direct infiltration of the ilioinguinal, iliohypograstric, genitofemoral nerves with 10 ml of 2% carbocaine (mepivacaine), 10 ml of 0.5% marcaine (bupivacaine), tamponing with 5 ml H_2CO_3 and diluted with 75 ml NaCl. On average, we use 60% of the anesthetic solution. In no case has it been necessary to use general anesthesia.

According to Trabucco's technique, a 4–6-cm incision is made and we expose the external oblique aponeurosis, which is opened to the level of the external inguinal ring. After having prepared the inguinal canal and the spermatic cord, we isolate the hernia sac, taking particular care at the internal ring. We never open the sac, except in cases of strangulated hernia. It is reduced and checked to ensure that it is sufficiently free. By making the patient cough or strain, we check that it comes out easily.

We then set a polypropylene circular plug of 5 cm diameter at the internal ring level. At this stage, the coughing does not result in the hernia sac coming out. We double the fascia trasversalis with a continuous suture that goes from the pubic tubercle to the inguinal internal ring, in order to level it. We then fashion the polypropylene plug so that the lower limit goes over the pubic tubercle by about 1 cm. We set the plug on the fascia trasversalis, paying attention not to form wrin-

Table 1
Cases of hernioplasty according to Trabucco

Operations by appointment	461 (94.3%)
Emergency operations	28 (5.7%)
Males	455 (93.1%)
Females	34 (6.9%)
Average age (years)	57.9
Total no. of operations	489
Recurrences	1 (0.2%)

Table 2
Stay in hospital and kind of anesthesia

Kind of anesthesia	No. of operations	Average stay
General	51 (10.4%)	7.8 days
Epidural	25 (5.1%)	5.7 days
Spinal	192 (39.3%)	2.1 days
Local	221 (45.2%)	1.7 days
Stop and go	6	2 h

Table 3
Stop and go hernioplasty: selection criteria for patients

	Yes	No
Psychosocial conditions	Favorable	Unfavorable
Anesthesia risk	ASA I–II	ASA III–V
Obesity	< 30%	> 30%
Recurrent hernia	1st Recurrence	Multirecurrent
Distance from hospital	< 90 min	> 90 min
Family support	Present	Absent

kles or empty spaces below it, which may cause seroma, without any stitches because the pressure from the tissues themselves and the rapid fibroplastic response will fix the plug in position.

Fibroblastogenesis induced by the plug starts after 5 or 6 h. In order to avoid dislocation of the prosthesis that may be caused by the immediate mobilization of the patient, we apply in the stop and go method the human fibrin glue (2 ml tissucol spray), in order to uniformly fix the plug before fibroblastogenesis starts or at least before it develops sufficiently. Tissucol spray (2 ml) is applied on the whole of the surface of the plug so that it is fixed and also perfectly flat.

We conclude the operation by suturing the fascia and positioning the spermatic cord in a subcutaneous site. The cutis is sutured with a vicryl rapid intradermic suture that does not require removal. Once the operation is over, the patient is asked to get up and, together with members of personnel, the patient walks to his room where he dresses and goes home.

Patients are requested not to drive for 24 h, but they can resume normal activities on average on the 2nd day and manual working or sport activities from the 2nd week.

A phone number they can call for advice is given to the patient. The use of postoperative analgesics and possible postoperative complications (hemorrhages, subcutaneous hematomas, edema and/or ecchymosis of the scrotum or penis) are explained both to the patient and his relatives in order to reduce possible fear in the postoperative period.

3. Results

The initial results are very encouraging. In all the patients who have undergone a stop and go hernioplasty, we have found complete acceptance of the method. In no case has it been necessary to subject the patient to general anesthesia during the operation. The average time for the operation has been 35 min. The average stay in the hospital has been 2 h. The possibility of reaching the operating room on foot and, above all, the possibility of going back to the patient's room on foot has raised enthusiasm in the patients, no matter what their age was. No patient has needed check-ups apart from routine ones. We have had complications neither in the short nor in the long term.

In the first two cases, we had planned a clinical checkup after 24 and 72 h, and then, just like the usual follow-up, on the 7th day, after 1 month, after 6 months and then yearly for 3 years. From the third case onwards, we have decided to plan the usual check-up scheme also for the stop and go hernioplasty, unless differently required by the patient. At the 7th day check-up, we have asked the patient to fill in an operation and postoperative pain evaluation form, with grades ranging from 1 to 10. With all the patients, the initial pain evaluation was around 3–4, regarding the cutis infiltration, then the pain goes down to 1 or 2 during the operation. As for postoperative pain, we have had 1 for the first day and nothing for the following days.

The almost complete absence of pain is very different between the patients treated with the stop and go method and the ones treated with the traditional technique, for whom the pain level stays around 3–4 until the 5th day and then 1–2 until the 6th or 7th day.

This has an objective verification in the analgesic treatment required by the patients. We prescribe analgesic for 24 h, and then according to needs. The patients submitted to a stop and go procedure have not used further analgesic but the patients treated with Trabucco's classical technique have used analgesic, on average, until the 4th or 5th day.

4. Discussion

The arrival of prosthesis hernioplasty has created a real revolution in the treatment of hernias. The repair of the wall defect, at the basis of the hernia, using a mesh plug rather than using the anatomical structure of the wall, has made it possible to drastically lower the rate of recurrence, to make both short- and long-term complications almost disappear, to reduce postoperative pain and to drastically reduce the stay in hospital to a few hours.

This is due to the fact that by not using the nearby anatomical structures and by not fixing the plug onto them, the ailment due to the traction on the anatomical structures themselves disappears, and hence the postoperative pain decreases. The physiopathological basis of the plastics is based on the ability of the plug to stimulate a strong fibroblastogenesis that strengthens the weak point that caused the hernia.

In Trabucco's technique we see that the plug, set on the internal inguinal ring, is sufficient to block the hernia neck. The plug, once set on the back of the wall of the inguinal canal, makes the plastics doubly safe.

When, after a positive experience with this technique, we considered the possibility of undertaking an ambulatory treatment, our only concern was the possible dislocation of the plug because of the immediate mobilization of the patient. In fact, we know that the fibroblastogenesis begins about 5 or 6 h after the operation. This could cause an increase in terms of recurrence, both because of seroma and because of an incomplete fibrosis of the wall defect because of the dislocation of the plug.

We were driven to optimize hernia treatment both in terms of costs and in terms of the welfare of the patient

who, in an ambulatory setting, is able to have his operation without giving up the comfort of his own house. On the other hand, we feared an increase in complications and recurrences. We believed we could allay our fears by fixing the polypropylene plug with human fibrin spray glue. In this way, the plug is perfectly leveled and fixed on the back wall of the inguinal canal, at the same time eliminating the danger of seroma below the plug which, by giving rise to spaces, can cause recurrences.

The other datum that comes out in this still short experience of ours is the remarkable reduction of pain with the stop and go method. This fact, in our opinion, can be explained by two considerations. Firstly, it could be due to a better psychological approach with the patient, who is constantly informed of everything that concerns him, with a resulting decrease of the anxiogenic component of pain. Secondly, considering that the anxiogenic component is at a maximum during the operation and then should spontaneously decrease in the postoperative period, the remarkable reduction of pain could be caused by the absence of mechanical stimuli by the plug on the nerve-endings, since the plug is covered with fibrin.

This information must be verified with greater numbers than what we have so far, but it is definitely a stimulus to continue further with this experience.

5. Conclusion

Our experience with the ambulatory technique is still of too short duration to be able to draw a definite conclusion, but at first sight we can state that this kind of hernioplasty is simple to perform and gives excellent results, without complications or recurrences until the check-up after 1 month. The patients themselves like this method both for the low pain and for the possibility of performing the operation under local anesthesia, and also because it allows them to go back home and quickly resume normal activities. The results we have so far have also proved that this technique is handy and does not depend on the surgeon. In our division, all the surgical operators have performed it, obtaining the same results. We can thus conclude that the hernioplasty according to Trabucco, using human fibrin glue to immediately fix the plug, makes it possible to perform the operation in an office-based surgical suite, makes it possible to keep the costs at a low level with a more rational use of hospital beds and allows the patient to have his problem solved without giving up the comfort of staying in his own home.

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