

Iliohypogastric neurectomy in the prevention of postoperative pain following inguinal hernioplasty

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SUMMARY: Iliohypogastric neurectomy in the prevention of postoperative pain following inguinal hernioplasty.

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Chronic postoperative pain is a common complication of inguinal hernia repair. An important Danish study revealed that 28.7% of patients undergoing hernioplasty suffered a varying degree of chronic pain, severe enough to interfere with normal daily activities in 11% of cases.

The difficulty in treating this complication has led numerous surgeons to complete the surgical procedure ilioinguinal or iliohypogastric neurectomy. This method is proving effective in preventing the onset of chronic postoperative pain.

We report the results obtained in patients undergoing neurectomy of the iliohypogastric nerve during anterior inguinal hernioplasty.

RIASSUNTO: La nevrectomia dell'ileo-ipogastrico nella prevenzione del dolore postoperatorio nell'ernioplastica inguinale.

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Il dolore cronico post-operatorio rappresenta una complicanza piuttosto frequente della terapia chirurgica dell'ernia inguinale. Un'importante indagine svolta in Danimarca ha dimostrato che il 28,7% dei pazienti operati di plastica erniaria ha un dolore cronico di varia gravità e nell'11% dei casi la sintomatologia dolorosa è tale da interferire con le normali attività quotidiane.

Il difficile trattamento di questa complicanza ha indotto molti chirurghi a completare l'intervento chirurgico di plastica erniaria con la resezione del nervo ileoinguinale o Ileoipogastrico, pratica che si sta dimostrando efficace nel prevenire l'insorgenza del dolore postoperatorio cronico.

Nel nostro studio riportiamo i risultati da noi ottenuti in pazienti sottoposti a nevrectomia del nervo ileoipogastrico durante ernioplastica inguinale per via anteriore.

KEY WORDS: Inguinal hernioplasty - Neurectomy.
Ernioplastica inguinale - Nevrectomia.

Introduction

Inguinal hernia is one of the most common diseases in the world. It generally affects middle-aged adults, but is also seen in children and the elderly. Men are 7 to 10 times more likely to be affected than women (1). This difference is due to anatomical differences in the inguinal canal. In men, it is crossed by vessels and nerves lea-

ding to the ipsilateral testicle and is thus more vulnerable than in women, where it consists only of the round ligament and a protrusion of the peritoneum (the canal of Nuck).

One of the most feared complications of surgical inguinal hernia repair is chronic postoperative pain (2, 3). This is poorly tolerated by patients as it is often disabling and, given that it is the consequence of a benign condition, may also have significant medicolegal implications. To prevent this complication, many authors have proposed neurectomy of the ilioinguinal and/or iliohypogastric nerves during inguinal hernia surgery (4).

The aim of our study was to compare the short and long term results in two homogenous patient groups undergoing, between March 2009 and April 2010, inguinal hernioplasty with a tension-free technique with and without neurectomy of the iliohypogastric nerve (5).

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Patients and methods

The study included 30 patients aged 25 to 87 years (mean 58). The exclusion criteria were as follows: recurrent and/or bilateral hernia, emergency procedures, diabetes mellitus, peripheral nerve disease, neuromuscular disease, reduced motor capacity.

The hernioplasty involved the implantation of a polypropylene mesh. The only stitches were made to fix the mesh to the pre-pubic fibrous tissue and around the spermatic cord. In the case of external oblique hernias, the hernial sac was isolated up to the deep inguinal ring and reduced in the abdomen, while for direct hernias the *fascia transversalis* was plicated with 2/0 monofilament. Local infiltration anesthesia was carried out in all cases, with additional sedation with propofol where necessary. Neurectomy of the iliohypogastric nerve was carried out in 15 patients (Group A) from its emergence on the inner oblique muscle until the point where branching began. The remaining 15 patients (Group B) did not undergo neurectomy.

The success of the procedure was measured in terms of pain and locoregional dysesthesia, evaluated from 30 days to 1 year post-surgery. Postoperative pain was measured using the Visual Analogue Scale (VAS), considering values of ≥ 4 to be significant. Follow-up was carried out 1, 7, 30, and 180 days and 1 year post-surgery (6).

Results

There were no major intra- or postoperative complications in either group. All patients were discharged the morning after surgery.

In group A, significant postoperative pain was reported by 5 patients (16%) on day 1, 3 (10%) on day 7, 1 (3%) on day 30, and none after 6 and 12 months. In group B, postoperative pain was reported by 7 patients (23%) on day 1, 4 (13%) on day 7, 2 (7%) on day 30, and 1 (3%) after 6 and 12 months.

Locoregional dysesthesia also improved in both groups during follow-up. In group A, it was reported by 2 patients (6%) on day 30 and after 6 months, and by 1 patient (3%) after 1 year. In group B, it was reported by 1 patient (3%) on day 30 and after 6 months, and by no patients after 1 year.

Discussion

The approach to hernia surgery is generally based on two interpretations of the groin area. The first traditionally considers the inguinal canal as a tunnel with a deep-lying entry point, a surface outlet and four walls, i.e. lower, upper, lateral and medial. The second, described by Anson and McVay, identifies an area of tunnel wall "weakness", defined as the myopectineal orifice (7, 8).

Acquired hernias are the result of an imbalance between intra-abdominal pressure and the resistance of the walls. The transversalis fascia is a key part of this resistance, with numerous anatomical elements and dynamic muscle mechanisms contributing to and reinforcing

its tone. In contrast, a lack of conjoined tendon and a congenitally thin iliopubic tract may weaken the area, favoring the development of a hernia.

Hernia surgery is today based principally on Lichtenstein's concept of tension-free repair (9). This technique both minimizes short-term postoperative discomfort and speeds the return to normal daily activities, as well as reducing recurrences (10). However, despite this important progress, chronic (> 3 months) postoperative pain remains a problem (11, 12). Its incidence according to literature evidence is relatively high at 6-30% (13, 14, 15, 16), and medical treatment with numerous techniques such as local anesthetic and/or steroid infiltration, cryotherapy, and behavioral therapy is not always successful (11). Various risk factors for this complication have been identified, comprising "heavy" implants, high BMI and young age (4, 11, 17).

To understand and treat this symptom, it is important to distinguish between nociceptive and neuropathic pain. The former is mainly due to chronic inflammation, while the latter develops consequent to an intraoperative iatrogenic injury to a nerve structure and may be helped by surgery. These nerve injuries may arise through various mechanisms: partial or total section of the nerve fibers, possibly resulting in a neuroma, nerve compression by stitches, the mesh or perineural fibrosis, or irritation due to contact with foreign bodies, such as the mesh itself.

The nerves involved in inguinal hernia repair are the iliohypogastric and ilioinguinal nerves and the genital branch of the genitofemoral nerve. Given its natural pathway, there is a high chance that the iliohypogastric nerve in particular will come into contact with the mesh during its insertion, giving rise to a risk of the above-mentioned mechanisms (4, 17, 18). There is considerable literature evidence that preventive neurectomy of the iliohypogastric (or ilioinguinal) nerve during inguinal hernioplasty is associated with a significant reduction in the incidence of chronic postoperative neuropathic pain (4, 12, 13, 17, 18). Amid, while not in favor of preventive neurectomy, carries out a triple neurectomy in cases of chronic postoperative pain resistant to any other treatment, obtaining complete remission of pain symptoms in 85% of patients and a significant reduction in another 15% (19).

The main side effect associated with neurectomy is dysesthesia, which however does not appear to be clinically significant. In fact, the incidence of dysesthesia in patients undergoing ilioinguinal nerve resection in a study conducted by Dittrick (13) was not significantly higher than that of other patients and diminished over time, suggesting - as also theorized by other authors (12) - that adjacent nerves compensate in some measure. In another study of iliohypogastric neurectomy (17), hypoesthesia at one month was greater in the treatment

group than in the control group, but this difference had disappeared by six months after surgery.

Although the small caseload involved in our study does not permit any statistically significant conclusions, our results were in line with those discussed above. In any case, it should be noted that there is as yet no full consensus on whether or not to perform preventive neurectomy in all patients undergoing inguinal hernioplasty. For example, Smeds suggests it should be carried out only in such cases where a nerve is at high risk of injury due to its pathway or interference with the mesh (4).

However, all authors agree on the importance of the precise and full identification of the nerve structures of the inguinal canal during the procedure. It has in fact been demonstrated that correct identification of the 3 nerves reduces postoperative pain, while failure to identify one of them is associated with a greater incidence of postoperative pain, as there is a greater risk of injuring a structure that has not been correctly identified (4, 10, 19).

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Conclusions

Until the 1990s, the main objective of hernia surgery was to avoid recurrences, justifiably considered a serious failure. The improved results and reduction in recurrences have shifted attention to chronic postoperative pain, which can in fact be even more disabling than a recurrence and is very often difficult to treat.

The literature evidence and our own experience support the assertion that careful handling of the 3 nerves of the inguinal canal seems to protect against the onset of chronic pain. If a nerve is inadvertently sectioned or injured, it must be removed completely to avoid this risk.

Iliohypogastric neurectomy is an easy procedure associated with a significant reduction in chronic postoperative pain. Any initial dysesthesia improves with follow-up and symptoms have never been reported as disabling. We therefore consider that removal of this nerve during anterior inguinal hernioplasty is an effective way to prevent postoperative pain, with no significant long-term side effects.