JMS 2023; Vol 6 (1):24-30
UDC:616.383.9-007.43-089.844-009.7
DOI: 10.55302/JMS2361024js

EVALUATION OF POSTOPERATIVE PAIN IN PRESERVATION AND ELECTIVE DISSECTION OF THE ILIOINGUINAL NERVE IN INGUINAL HERNIOPLASTY

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Abstract

Introduction: The use of mesh techniques in the treatment of inguinal hernias significantly reduces recurrences. However, the incidence of inguinodynia still present significant complication.

Material and methods: The study was designed as a randomized, prospective, unilaterally blind clinical study. Forty male patients were included, to whom hernioplasty by Lichtenstein method with implantation of polypropylene mesh was performed. Patients were divided into 2 groups of twenty patients each. In the first one the technique of the ilioinguinal preservation was used, and in the second one dissection of the ilioinguinal nerve was performed. At appropriate time points two types of scales were used to assess the intensity of the pain: Numeric scale of pain (NSP) and Stanford pain scale (SPS).

Results: Data from 40 patients has been analyzed, of which 20 with preservation and 20 with dissection of the ilioinguinal nerve. Inguinodynia was present in two patients, one in each group, i.e. 5%, which indicates that there was no significant difference in the occurrence of inguinodynia in the group with preservation and dissection of the ilioinguinal nerve.

Conclusion: No single direction can yet be given as to whether it is better to preserve or dissect the inguinal nerves, and there is also division over whether, if a neurectomy should be performed, it should be limited to the IIN or a triple neurectomy should be performed.

Key words: inguinodynia, inguinal hernia, mesh techniques.

Introduction

One of the most common pathologies in the human population is the inguinal hernia. Every year, more than 20 million inguinal hernia repairs are performed worldwide. From the very beginning until today, the operative techniques for solving this problem have changed, but a revolution in hernioplasty has been achieved with the appearance of mesh techniques, which today represent the gold standard in the treatment of this problem. With the advent of prosthetic material in the treatment of hernias, the percentage of recurrences in inguinal hernioplasty, which were the main complication of this procedure, has significantly decreased. At the expense of that, the incidence of chronic inguinal pain, or the so-called inguinodynia, has increased, what now represents the most important complication in the postoperative period [1,2,3]. The appearance of mild postoperative pain in the first few days that is relieved by analgesics is a normal phenomenon and should be distinguished from inguinodynia, which according to the International Association for the Analysis of Pain (IASP) is chronic postoperative inguinal pain (CPIP) that persists for more than 3 months, after inguinal hernioplasty and is of moderate or strong intensity [4,5]. The real reason for the occurrence of inguinodynia is unclear, and for this purpose, numerous studies have been made that include techniques with and without the use of mesh, comparison methods what happens when using different types of prosthetic material, different suture material or fibrin glue, etc [6,7,8]. The main motive for this clinical research was to get a true idea of the causes of the occurrence of inguinodynia postoperatively and to resolve another dilemma, whether preservation or dissection of the ilioinguinal nerve in inguinal hernioplasty according to the Lichtenstein method is a better choice to reduce the incidence of inguinodynia which now amounts to 7-10%.

Material and methods

The clinical research took place at the University Clinic for Surgical Diseases "St. Naum Ohridski" in Skopje, where in a randomized, prospective, single-blind study according to design, 40 male patients with a diagnosis of primary unilateral inguinal hernia, aged 18-70 years, signed consent for performing surgery under anesthesia and informed consent to participate in a clinical study as well. Study participants underwent inguinal hernioplasty according to the Lichtenstein method, and the occurrence of inguinodynia and its impact on quality of life were monitored postoperatively. Patients included in the trial were randomized into two groups:

- group A: where the ilioinguinal nerve was identified and preserved intraoperatively;
- group B: where intraoperative identification and dissection of the ilioinguinal nerve was performed.

Randomization was performed intraoperatively, whereby all patients in whom the anatomical conditions allowed preservation of the ilioinguinal nerve were randomized to group A, and where that was not possible, dissection was performed and those patients were randomized to group B. A one-sided blind clinical study was applied, so the patients were not aware in which group they belonged to, in order to avoid subjectivity in the perception of pain. In all patients participating in the clinical study, the standardized, hernioplasty operative method was performed according to the Lichtenstein method, in which a polypropylene mesh prosthetic material was implanted in all of them, in order to remove the influence of the use of different prosthetic material. According to the operative technique of the method, the first step approached to the opening of the front wall of the inguinal canal, the second step was about identification of the funiculus spermaticus and its closure, followed by identification of the hernia sac, preparation and intra-abdominal inversion (or reduction), after placing a suture ligature on the neck of the same. Finally, we proceed with the plastic surgery of the back wall of the inguinal canal by placing a polypropylene mesh, revision of hemostasis and closure in layers.

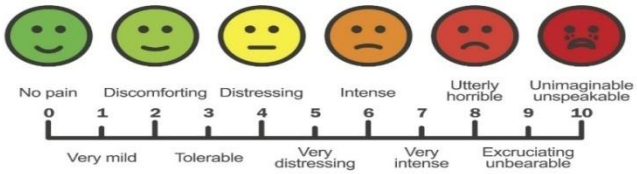
Postoperative controls were performed after one week, one month, three months and six months, during which the following was followed in both groups:

• the occurrence of pain in the inguinal region during a period of 6 months, namely:

- o neuropathic pain (paresthesia, hypoesthesia or hyperesthesia) which was indicated by 1 and
- o somatic pain (neuralgia) which was marked with 2;
- duration of pain in the inguinal region during a period of 1-6 months;
- the impact of pain on the quality of life:
  - o had an impact (yes)
  - o had no impact (no), and the same was ranked according to IQL (impact on quality of life) with (yes or no).

The intensity of the pain was ranked according to a numerical scale for pain, NSP (numeric scale of pain) from 0-10. For the needs of the research, a comparison of the NSP values with the Stanford pain scale (SPS) was made, which was visual and more understandable for the patients.

In continuation SPS is presented:



0 no pain
1-3 discomfort
3-5 distressing pain
5-7 intense pain
7-10 excruciating unbearable

Statistics

Statistical analysis was performed using SPSS for Windows, version 17 (USA). The Fisher-Freeman-Halton exact test was used to determine the association between certain characters in group of patients. The Sperman Rang Order Correlation test was used to determine the correlation between two variables. In order to test the significance of the difference between certain analyzed parameters, depending on the type and distribution of data, the parametric Student's t-test and ANOVA as well as nonparametric tests for independent samples (Mann Whitney U test) were used. A level of $p \leq 0.05$ was considered statistically significant.

Results

Results of the 40 patients have been analyzed. There were 23 (57%) patients with right-sided inguinal hernia, and 17 (43%) patients with left-sided inguinal hernia (Figure 1).

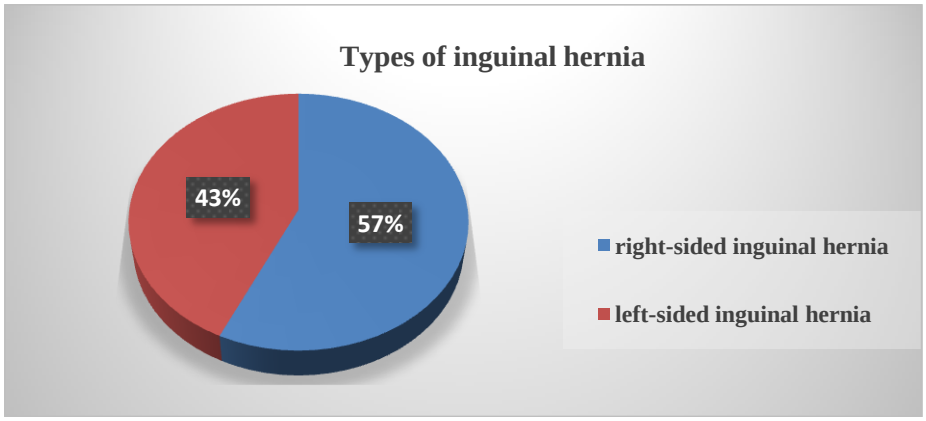


Figure 1. Types of inguinal hernia

According to the type of hernia, 7 patients had direct, and 33 patients had indirect hernia. Regarding the age of patients with inguinal hernia, 20 patients (50%) were between 61-70 years, 5 patients (13%) were between 51-60 years, 12 patients (30%) were between 41-50 years, 1 patient (5%) was between 31-50 years and 2 patients (5%) were between 18-30 years (Figure 2). The average age of the analyzed patients was 55 years.

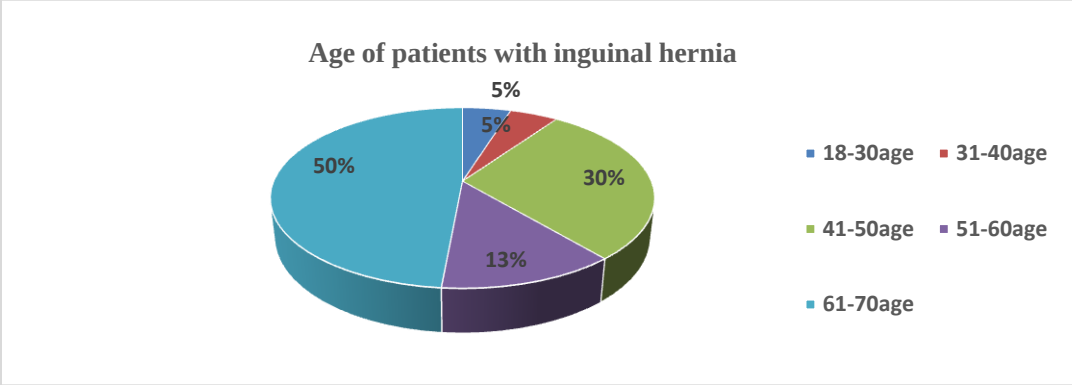


Figure 2. Age of patients with inguinal hernia

Twenty (20) patients were included in group A (technique of the ilioinguinal preservation used) and twenty (20) in group B (dissection of the ilioinguinal nerve performed) (Figure 3).

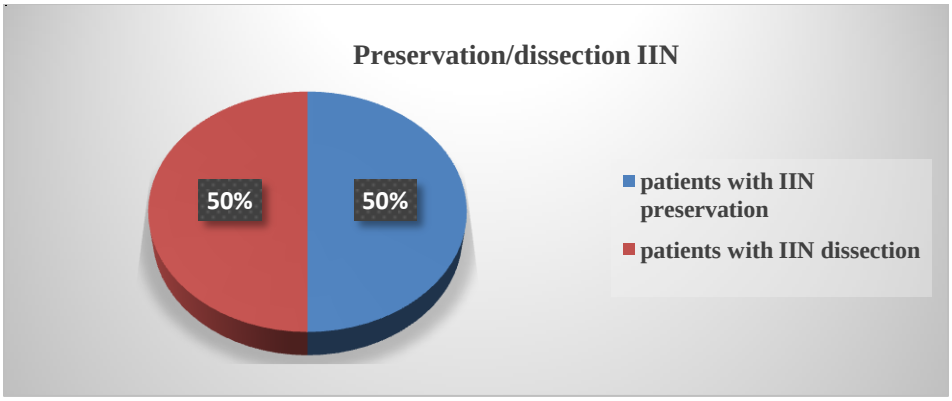


Figure 3. Patients with inguinal hernia where technique of the ilioinguinal preservation was used and patients with inguinal hernia where dissection of the ilioinguinal nerve was performed.

According to the NSP in the preservation group pain occurred in one (1) patient with intensity 5, which lasted for 5 months and was described as a short tingling pain in the inguinal region. In the dissection group, there was also pain in one (1) patient with intensity 2, which lasted 5 months and was described as constant pain in the inguinal region (p>0,05) (Table 1).

Table 1. Pain registered according to the Numeric scale of pain (NSP)

Pain registered	Number of patients	Intensity	Duration of pain	Presentation	Pain controlled	Impact of quality of live
Patients with IIN preservation	1	5	5 months	Short tingling pain in the inguinal region	Yes/analgesics	No
Patients with INN disecction	1	2	5 months	Constant pain in the inguinal region	Yes/analgesics	No

Compared to SPS there was a correlation in intensity. In both cases, the pain was controlled with analgesics and there was no impact on the quality of life. In group A (with preservation) there was pain after the first week in 3 patients, and in group B (with dissection) in 5 patients. They were treated with analgesics. After one month, pain was present in one (1) patient of the preservation group and one (1) patient of the dissection group and it persisted after three months since the operation, accounting for 5% in the first group and 5% in the second group (p>0,05). In the preservation group the pain was

neuropathic marked as 1 and the patient was in the sixth decade, and in group B somatic pain marked as 2 and the patient was in the fourth decade (Table 2).

Table 2. Pain registered according to Stanford pain scale (SPS)

Pain registered	Number of patients			
	1 week after operation	After one month treated with analgesics	Duration	Presentation
Patients with IIN preservation	3	1	3months	Neuropathic pain
Patients with INN disecction	5	1	3months	Somatic

Discussion and conclusion

Pain that lasts longer than three months after inguinal hernioplasty is called inguinodynia. It is the subject of analysis by many authors because it includes 7-10% of operated patients with inguinal hernia, whose number worldwide is more than 20,000 000 per year. From the previous research, it is indicated that not only the etiology of this problem is multifactorial, but at the same time is also complex and the previous analysis not only do not provide answers to the questions but also open up new dilemmas that will need to be analyzed in some subsequent research. The previous analysis point out the fact that inguinodynia is more common in the young and middle-aged population, that it is still not possible to give a single direction on whether it is better to preserve or dissect the inguinal nerves, while there is also a dilemma about the fact that if necessary to do a neurectomy to limit it to IIN or to do a triple neurectomy [9,10,11]. Current research shows that the etiology of inguinodynia is multifactorial, starting with the type of mesh used, suture material versus fibrin adhesive, nerve traction or intra operative damage, postoperative fibrosis, etc [7,8]. As much as the etiology of inguinodynia is complex, so is its diagnosis due to the fact that each of the three nerves can be the cause of it, while the diagnosis can hardly be established due to the common origin of inguinal nerves. Of course, the exception is a small number of cases where CT or MRI can directly show the cause of this condition, such as neurinoma or excessive fibrosis in which the nerve is affected. Depending on how much inguinodynia affects the quality of life, so the approach to the treatment of this condition should be adequate, from conservative with the use of analgesic therapy, to nerve block and surgery. But even in the case of surgery there are again numerous dilemmas, i.e. whether to remove only the IIN or to perform a triple neurectomy (IIN IHN, NGF) [11,12]. Due to the numerous dilemmas that are becoming more and more open, many previous studies point to the fact that the best therapy for inguinodynia is its prevention, i.e. paying more attention during these operations by showing all anatomical structures, without traction and soft surgical technique, because the subsequent diagnosis and therapy of the same is complex [12].

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