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INGUINODYNIA – PRESERVATION VERSUS DISSECTION OF THE ILIOINGUINAL NERVE

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Abstract

Inguinal hernia is one of the most common pathologies in the human population and it requires 20 million repairs annually worldwide. Introduction of mesh techniques, after inguinal hernioplasty significantly decreased recurrences. However inguinodynia, represented by 7-10%, remains significant problem.

Fifty (50) male patients, aged 18-70 y with a diagnosis of unilateral primary inguinal hernia were included in this clinical study, which was designed as a single-blind, randomized and prospective study. Study participants underwent inguinal hernioplasty according to the Lichtenstein method. Patients were randomized into two groups:

- group A (25 patients) in which IIN (ilioinguinal nerve) preservation was performed;
- group B (25 patients) in which IIN (ilioinguinal nerve) dissection was performed

Postoperatively, the occurrence of pain and its impact on the quality of life was monitored.

Fifty (50) patients were analyzed: 25 in group A and 25 in group B. Inguinodynia was present in a total of two patients, one in each group, i.e. 4%, which indicates that there is no significant difference in the occurrence of inguinodynia in both compared groups.

Results of our study indicate absence of significant difference in the occurrence of inguinodynia in the group with preservation and the group with dissection of the IIN.

Key words: inguinodynia, inguinal hernia, mesh techniques.

Introduction

Inguinodynia or so called Chronic postoperative inguinal pain [CPIP] according to the International Association for the Analysis of Pain [IASP] represents pain that persists longer than 3 months after inguinal hernioplasty. The etiology of inguinodynia is yet not elucidated and is multifactorial. [1]

The pain can be classified as neuropathic, non-neuropathic [somatic] and mixed.
Neuropathic pain can be manifested as paresthesia, hypoesthesia, allodynia or hyperalgesia, and increases when sitting or walking. It occurs due to damage of the inguinal nerves [n. ilioinguinalis IIN, n. genitofemoralis GFN, n. iliohipogastricus IHN], where the injury is due to nerve section, stretching, entrapment or compression of the inguinal nerves caused by suture material, prosthetic material, stepler etc.

When damaged, the axon can atrophy or neurinom and fibrous tissue can be formed during the body's attempt to regenerate, and thus causing the neuropathic pain.

Non-neuropathic pain is caused by an inflammatory reaction of the surrounding damaged tissue without direct damage of the inguinal nerves. Non-neuropathic pain is less intense, though continuous.

The polypropylene used in inguinal hernioplasty is known to cause a granulomatous reaction with hyperproduction of fibrous tissue that encapsulates the prosthetic material and it can become rigid, without elasticity which can cause pain. [2,3,4]

One-third of the patients with chronic postoperative inguinal pain reported pain before, during and after ejaculation, and it is believed that the testicular pain is related to the migration of mesh and the compression of the funiculus spermaticus.

Clinically, often the pain can have characteristics of both neuropathic and somatic pain. Having in mind the etiology is multifactorial it is possible that in the same time with the dissection there is a presence of an inflammatory reaction that affects other structures in the inguinal region and the other inguinal nerves.

In this case pain will have the characteristics of both neuropathic and somatic nature. Different authors report different incidence of inguinodynia, which varies from 0-70%, but most often from 7-10%[5,6,7].

The intensity of the inguinal pain is different and ranges from weak pain, moderate, to very strong pain. The last two types, moderate and very strong pain accounts for 5-6% and even 12% of the total pain and of importantance because they can affect the quality of life.Risk factors for the occurrence of inguinodynia are: younger age, severe preoperative pain and severe early postoperative pain. [8,9]

The greatest importance relates to postoperative pain, because it correlates with possible subsequent occurrence of inguinodynia. Therefore it should be treated early.

A clinical study conducted in Sweden points out that the occurrence of inguinodynia can be due to genetic predisposing factor.

The main motive for this clinical research was to elucidate the reasons for the occurrence of inguinodynia and to determine which of the compared methods [preservation or dissection of the IIN] could be preferable choice for reducing this condition.

Material and methods

This clinical study, was designed as a single blind, randomized and prospective study. Fifty (50) male patients aged 18-70 years, with a diagnosis of unilateral primary inguinal hernia were included. The study was performed at the University Clinic for Surgical Diseases "Sv. Naum Ohridski" in Skopje. Patients were randomized into two groups:

- group A [25 patients] in which preservation of the IIN [ilioinguinal nerve] was performed intraoperatively;
- group B [25 patients] in which dissection of the IIN [ilioinguinal nerve] was performed intraoperatively.

Participation in the study was based on inclusion and exclusion criteria. All patients have signed consent for preoperative examinations and complete surgical procedures including anesthesia, as well as informed consent for participation in this clinical trial, in accordance of the Ethical principles of the Declaration of Helsinki.

The approval was obtained by the Ethical Committee at UKIM- Faculty of Medicine- Skopje.

All patients underwent a standardized surgical procedure-hernioplasty with the use of prosthetic material Polyproilene mesh according to Lichtenstein's method.

At the same time, in the group A [25 patients], IIN preservation was performed intraoperatively, and in the group B [25 patients], dissection technique was performed.

Postoperatively, the following parameters were followed in the week one and at the first, third and sixth month:

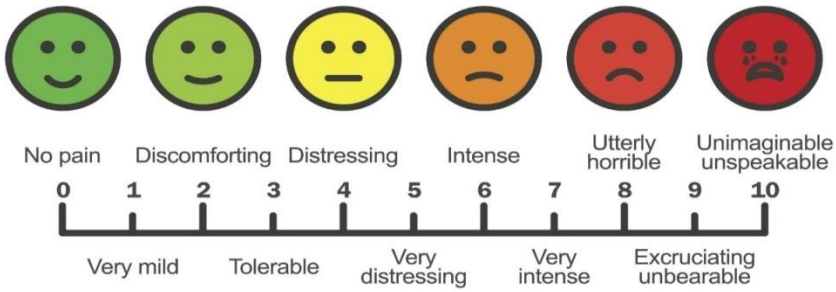
• Occurrence of pain in the inguinal region in a total period of 6 months described as:

- neuropathic pain [paresthesia, hypoesthesia, hyperesthesia] [which is marked as 1] and
- non-neuropathic pain, somatic [neuralgia] which is marked as 2;

• Duration of pain in the ingvional region for period of 1-6 months;

• The effect of pain on the quality of life according to IQL, which is marked as yes or no;

• The intensity of the pain, which is ranked according to the NSP [numerical pain scale] and is marked from 0-10, according SPS [Stanford pain scale]:



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- 0 no pain
- 1-3 discomfort
- 3-5 moderate pain
- 5-7 strong pain
- 7-10 very strong pain

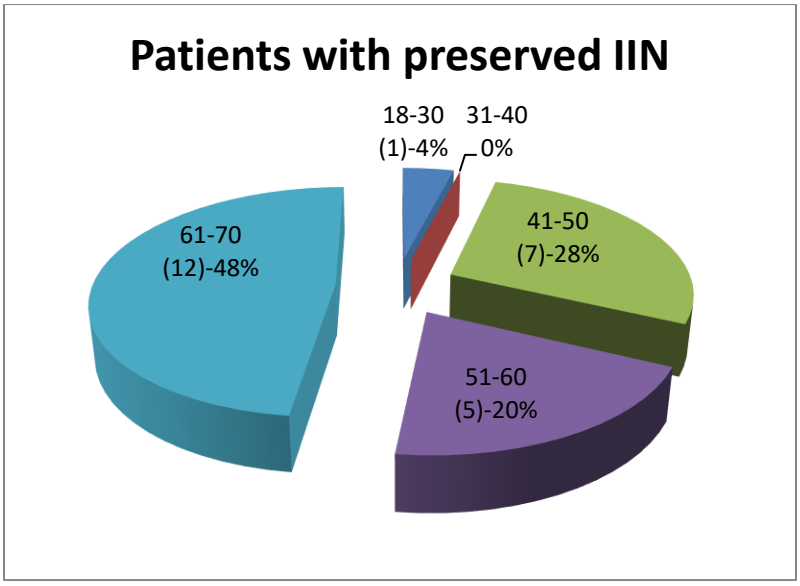

Figure.1. Presence of inguinal hernia by age

Age stratification:

- 18-30 years of age, 1 patient [4 %];
- 31-40 years of age, 0 patients [0%];
- 41-50 years of age, 7 patients [28%];
  - 51-60 years of age, 5 patients [20%];
  - 61-70 years of age patient, 12 patients [48%].

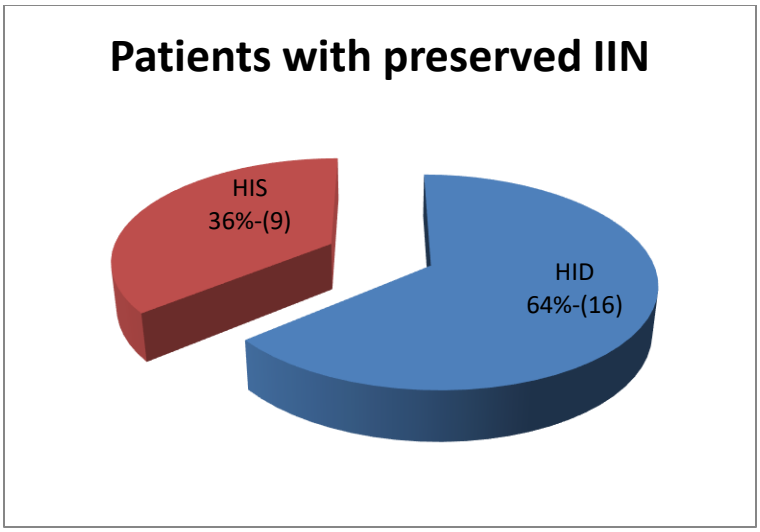

Figure.2. Presence of inguinal hernia upon side of occurrence (right side, left side)

Acording the type of inguinal hernia:

- 16 patients were with right side inguinal hernia (HID), 64%,
- 9 patients were with left side inguinal hernia (HIS), 36%.

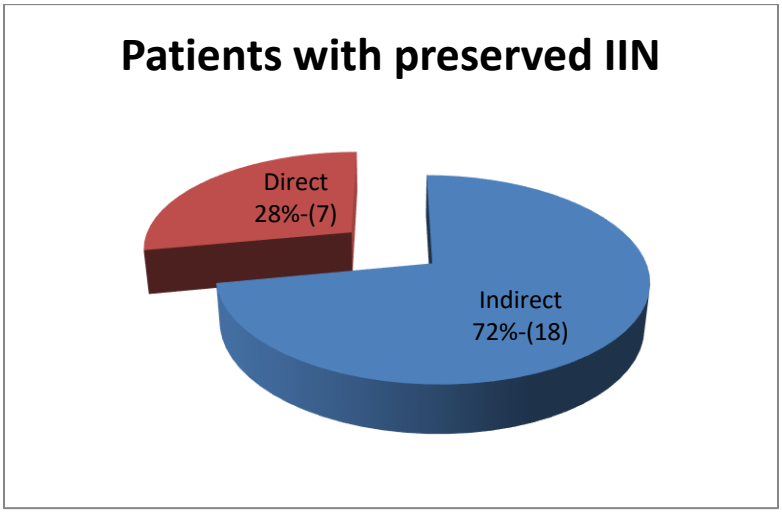

Figure.3. Replacement of inguinal hernia depends on the type of hernia (indirect, direct)

Acoording to type of inguinal hernia:

- 18 patients were with so indirect hernia,72 %,
- 7 patients were with direct hernia, 28 %.

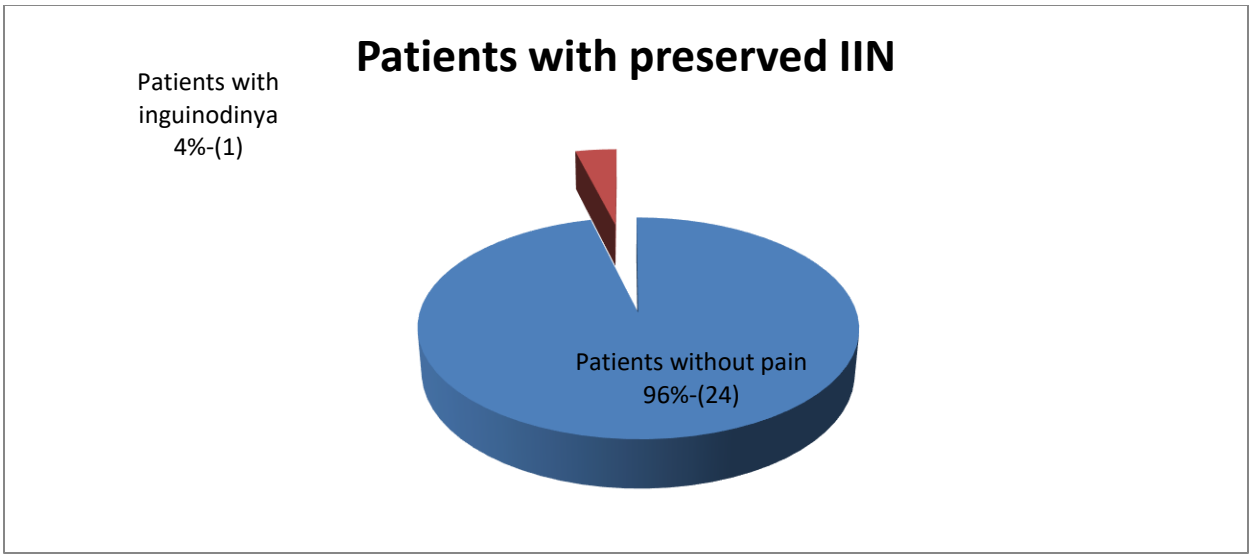

Figure.4. Prevalence of inguinodinya and patients with IIN preservation

Inguinodynia was present in 1 patient in the group with IIN preservation [4%]

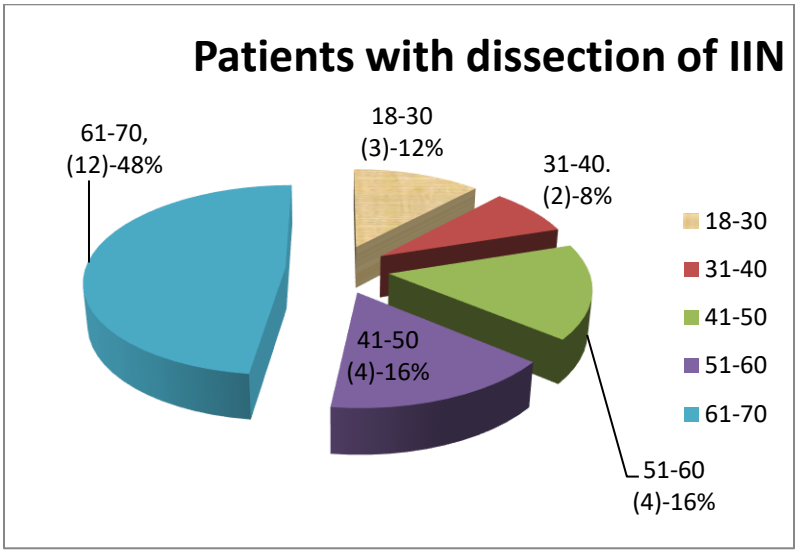

Figure.5. Occurrence of inguinal hernia by age

The prevalence of inguinal hernia by age:

- age 18-30 g 3 patients (12 %),
- age 31-40 g, 2 patients (8%)
- age 41-50 g, 4 patients (16%)
- age 51-60 g, 4 patients (16%)
- age 61-70g, 12 patients (48%)

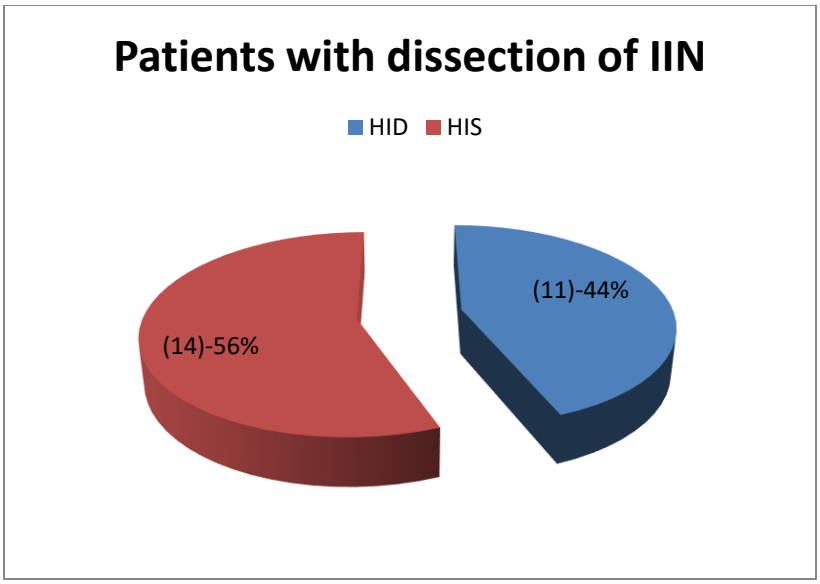

Figure.6. Presence of inguinal hernia upon side of occurrence [right side, left side]

Regarding sides of the presence of inguinal hernia:

- 11 patients had right inguinal hernia [HID], 44%,
- 14 patients had a left-sided inguinal hernia [HIS], 56%.

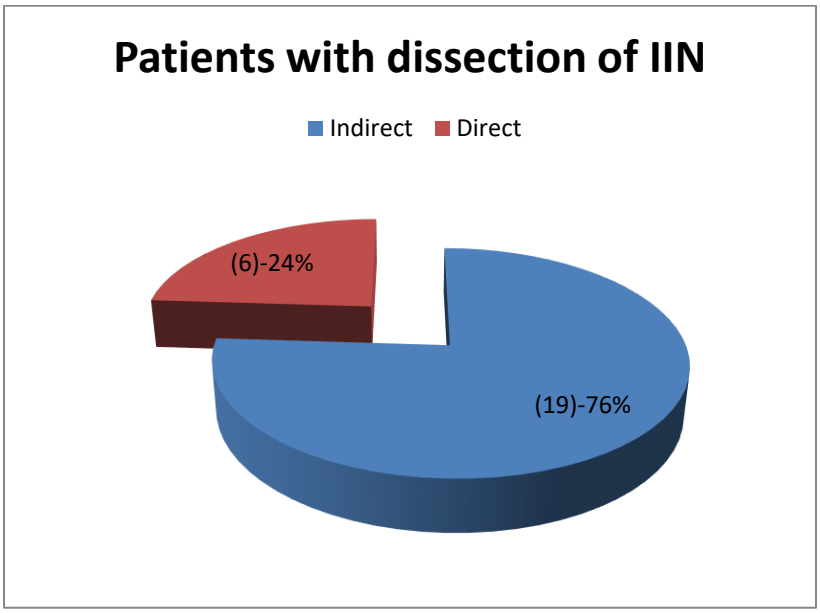

Figure.7. The incidence of inguinal hernia depends on the type of hernia [indirect, direct]

Regarding type of inguinal hernia:

- 19 patients had indirect inguinal hernia, 76%,
- 6 patients had direct inguinal hernia, 24%.

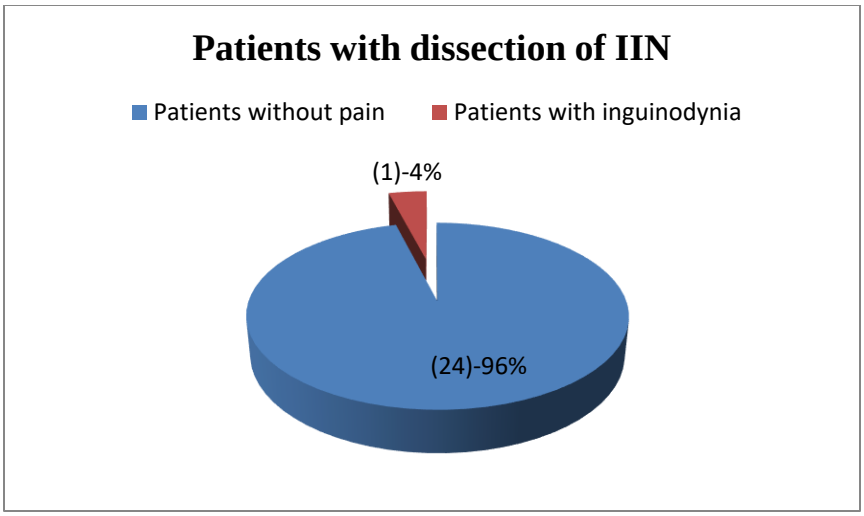

Figure.8 Prevalence of inguinal hernia in patients with IIN dissection

Inguinodynia was present in 1 patient in the group with IIN dissection [4%]

Statistics

Statistical analysis was performed using SPSS for Windows, version 17 [USA]. The Fisher Free man 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.

The following parameters were statistically analyzed:

- age of patients,
- side of occurrence of inguinal hernia,
- type of hernia (direct, indirect),
- intensity of pain,
- time delay on the pain,
- the effect of pain on the quality of life.

Fifty [50] patients were analyzed, 25 in the preservation group and 25 in the IIN dissection group. Inguinal hernia was present in two patients in total, one in each group.

Early postoperative pain	1 week after surgery	1 month after surgery	3 months after surgery	6 months after surgery
In patients with preservation of IIN	3	1	1	1
In patients with dissection of IIN	5	1	1	0

Inguinodynia	Number of patients	Intensity	Duration of pain in months	Clinical presentation	Impact on quality of life (IQL)	Therapy
In patients with IIN preservation	1	1-5 months pain with intensity 5 After 5 months pain with intensity 8	Longer than 6 months	1-5 months (short term pain) After 5 months - continuous pain with intensity 8	Yes	Operative treatment
In patients with IIN dissection	1	2	5 months	Paresthesia and pain in the inguinal region with weak intensity -2	No	Conservative treatment

The analysis did not show a significant difference in the occurrence of inguinal hernia in groups A and B. NSP was correlated with SPS.

Discussion

Results of numerous clinical studies don't give answer to the question and which approach - preservation or dissection of the IIN, is better in terms of reducing inguinodynia and open up new dillema. [10-15,]

During the clinical investigations, it has been demondtrated that in some patients, pain is present for longer than 3 months, but it subsides by the 6th month. This give us a prospect for thinking about the possibility of revising to the definition of inguinodynia, where inguinodynia represents chronic pain that lasts longer than 6 months.

Clinically, isolated neuropathic or somatic pain is rare, for most often the symptoms are combined, which indicates that the etiology or inguinal pain is multifactorial, and that in the same time the pain can be due to damage to the inguinal nerves and the presence of inflammation.

In the same time, in cases where when dissection of the IIN is performed, a question arises if this procedure is enough or a triple neurectomy is needed for any of the inguinal nerves can be the cause of pain. [16-20].

Having in mind that the reasons for the occurrence of inguinodynia are multifactorial, and the diagnosis and therapy are complex, most authors state that the best approach for inguinodynia is its prevention, and paying more attention during the operative procedure, with applying soft surgery techniques without damaging the anatomical structures in the inguinal region.

The importance of further analysis of the inguinodynia comes from the knowledge that this condition can have an impact on the quality of life and work ability, having in mind the fact that the incidence is about 7-10% and that 20 million hernioplasty operations are performed every year at the world level. [21] Therefore it must be taken in account that inguinodynia can have a further consequences on the society as a whole.

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