

# COMPARATIVE ANALYSIS OF THE RESULTS OF PLASTIC INGUINAL HERNIA LAPAROSCOPIC AND TRADITIONAL METHODS

<https://doi.org/10.35805/BSK2021IV027>

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## Abstract

**Purpose of the study.** Conduct a retrospective comparative analysis of the results of laparoscopic and traditional methods of inguinal hernia repair, patients treated at the surgical department of "A.N. Syzganov National Scientific Center of Surgery", Almaty, Kazakhstan.

**Materials and methods.** In the period from January 2017 to December 2020, 137 patients were operated at the "A.N. Syzganov National Scientific Center of Surgery" in a planned manner for inguinal hernia and all patients were divided into 2 main groups: operated by traditional methods and laparoscopic method.

**Results.** The data of the analysis suggests that the laparoscopic method of hernioplasty has an advantage over the traditional methods.

**Conclusion.** Based on a comparative analysis of the indicators of patients in both groups, it can be concluded that the duration of the operation for laparoscopic hernia repair is 92.3 minutes, significantly more than with traditional methods, which is 79.4 minutes.

Despite this, the duration of analgesic therapy in the postoperative period with laparoscopic hernia repair is 2.4 days, and the duration of hospital stay after surgery is 3 days, much less than with traditional methods, in which the duration of analgesic therapy in the postoperative period is 3, 3 days, and the duration of hospital stay after surgery is 4.6 days. This analysis suggests that laparoscopic hernioplasty has an advantage over traditional methods.

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## Conflict of interest

The authors declare that they have no conflicts of interest

## Keywords

inguinal hernia, laparoscopic hernioplasty, traditional methods of hernioplasty

## Лапароскопиялық және дәстүрлі шап жарығының пластикасы нәтижелерін салыстырмалы талдау

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## Аңдатпа

**Материал және әдістер.** 2017 жылғы қаңтардан 2020 жылғы желтоқсан айына дейін А.Н.Сызғанов атындағы Ұлттық ғылыми хирургия орталығында 137 науқасқа жоспарлы түрде шап жарығы бойынша ота жасалды. Барлық науқастар негізгі 2 топқа бөлінді - дәстүрлі және лапароскопиялық әдіспен ота жасалғандар.

**Нәтижелер.** Талдау деректері герниопластиканың лапароскопиялық әдісінің дәстүрлі әдісіне қарағанда артықшылығының болуына көз жеткізеді.

**Қорытынды.** Екі топтағы науқастардың көрсеткіштерін салыстырмалы талдау негізінде лапароскопиялық герниопластика бойынша операцияның ұзақтығы 92,3 минутты құрайды, бұл дәстүрлі әдістермен салыстырғанда айтарлықтай ұзағырақ, яғни 79,4 минут.

Осыған қарамастан, лапароскопиялық герниопластика бойынша операциядан кейінгі кезеңде анальгетикалық терапияның ұзақтығы 2,4 күнді, ал операциядан кейін ауруханада болу ұзақтығы 3 күнді құрайды, бұл дәстүрлі әдістермен салыстырғанда әлдеқайда аз, операциядан кейінгі кезеңде анальгетикалық терапия ұзақтығы, кезеңі 3, 3 күн, ал операциядан кейін ауруханада болу ұзақтығы 4,6 күн болды. Бұл талдау лапароскопиялық герниопластиканың дәстүрлі әдістерден артықшылығы бар екенін көрсетеді.

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## Түйін сөздер

шап жарығы, лапароскопиялық герниопластика, герниопластиканың дәстүрлі әдістері

## Сравнительный анализ результатов пластики паховых грыж лапароскопического и традиционных методов

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### Аннотация

**Цель исследования** - провести ретроспективный сравнительный анализ результатов лапароскопических и традиционных методов пластики паховых грыж у пациентов, пролеченных в хирургических отделениях Национального научного центра хирургии имени А.Н. Сызганова, Алматы, Казахстан.

**Материалы и методы.** В период с января 2017г. по декабрь 2020г. в «ННЦХ им. А.Н. Сызганова» 137 пациентов прооперированы в плановом порядке по поводу паховой грыжи, и все пациенты были разделены на 2 основные группы: прооперированных традиционными методами и лапароскопическим методом.

**Результаты.** Данные анализа позволяют предположить, что лапароскопический метод герниопластики имеет преимущество над традиционными методами.

**Выводы.** На основании сравнительного анализа показателей пациентов обеих групп можно сделать вывод, что продолжительность операции по лапароскопической герниопластике составляет 92,3 минуты, что значительно больше, чем при традиционных методах, составляющих 79,4 минуты.

Несмотря на это, продолжительность анальгетической терапии в послеоперационном периоде при лапароскопической герниопластике составляет 2,4 дня, а продолжительность пребывания в стационаре после операции - 3 дня, что намного меньше, чем при традиционных методах, при которых продолжительность анальгетической терапии в послеоперационном периоде составляет 3,3 дня, а продолжительность пребывания в стационаре после операции - 4,6 дня. Этот анализ показывает, что лапароскопическая герниопластика имеет преимущество перед традиционными методами.

### Ключевые слова

Паховая грыжа,  
лапароскопическая  
герниопластика, традиционные  
методы герниопластики

### Relevance

A hernia is a congenital or acquired defect in the muscular-aponeurotic integrity of the abdominal wall, which makes it possible for any formation to protrude through it, which does not occur here under normal conditions [1]. Inguinal hernia is the most common type of hernia (about 70% of the total) [2]. An inguinal hernia is a type of hernia of the anterior abdominal wall, in which the hernial sac is in the inguinal canal [3]. The main criterion for a hernia is the presence of a defect in the abdominal wall in the region of the inguinal canal. In this case, the presence of a hernial sac is not necessary, although usually the components of a hernia are: a hernial gate, a hernial sac, the contents of a hernial sac. The contents of the hernial sac can be represented by any organ of the abdominal cavity, but most often - by a strand of the greater omentum or a loop of the small intestine. An inguinal hernia can be unilateral: left- or right-sided, or it can have bilateral localization. Inguinal hernias are congenital and acquired, oblique and straight. Congenital inguinal hernia is always oblique and is formed only as a result of non-closure of the vaginal process of the peritoneum. The emergence of acquired oblique and straight inguinal hernias is largely due to the

anatomical weakness of the anterior and posterior walls of the inguinal canal [6, 8]. A hernia is not classified depending on the size of the hernial protrusion or the size of the hernial orifice, but may be accompanied by the presence or absence of the hernial sac descending into the scrotum. The contents of the hernial sac may or may not be adjusted into the abdominal cavity, hence the division of inguinal hernias into reducible and non-reducible hernias. An inguinal hernia is diagnosed annually: in Kazakhstan - 30,000 patients; in the Russian Federation - 220,000 patients; in the USA - 500,000 - 700,000 patients; in Germany - 180,000 patients [4]. Operations for inguinal hernias rank first in terms of frequency among elective surgical interventions [7]. Every year in the world about 20 million operations to remove inguinal hernias are performed [5]. Relapses in practical surgery occur after traditional methods of hernioplasty in 2–20%, and recurrences in 35–40% of patients, while after prosthetic techniques, relapse averages 1–5% [9, 10, 11]. There is a wide selection of plastic of the inguinal canal, and all these methods can be divided into 2 groups: traditional and laparoscopic. The question of the advantages of one or another plastic method remains relevant.

## Purpose of the study

Conduct a retrospective comparative analysis of the results of laparoscopic and traditional methods of inguinal hernia repair, patients treated at the surgical departments at A.N. Syzganov National Scientific Center for Surgery, Almaty, Kazakhstan.

## Materials and methods

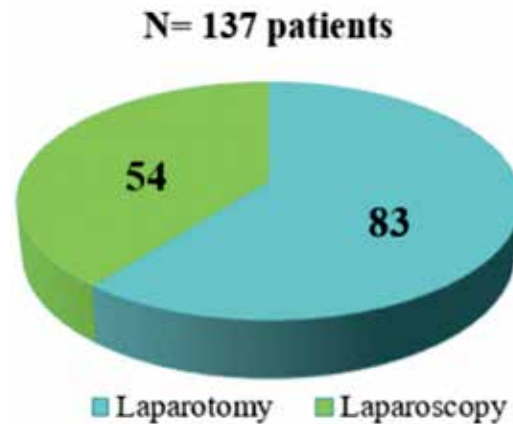
In the period from January 2017 to December 2020 in A.N. Syzganov NSCS 137 patients were operated in a planned manner for inguinal hernia.

As presented, all patients were divided into 2 main groups: Group 1 - 83 patients operated on by traditional methods of hernia repair; Group 2 - 54 patients operated on by the laparoscopic method (Fig. 1.).

The average age of patients in group 1 is 59.6 years (max = 88, min = 17); The average age of patients in group 2 is 50.9 years (max = 81, min = 19);

In both groups, hernia repair methods were performed using the «Ultra PRO» synthetic mesh made of monocryl-prolene composite material.

The choice of tactics of surgical treatment was largely determined by the presence of concomitant



**Figure 1.**

The main groups of patients presented in the comparative analysis.

pathology in the anamnesis and the size of the hernial protrusion.

## Results

Conducting a comparative analysis of the data of 137 patients operated in a planned manner since January 2017 to December 2020 about an inguinal hernia at A.N. Syzganov NSCS «between the two groups in terms of: gender ratio; localization of inguinal hernia: right-sided, left-sided and bilateral; the size of the hernial protrusion; the size of the hernia gate; the presence of lowering of the hernial sac into the scrotum - no statistical difference was found ( $p = ns$ ) (Table 1).

	Laparotomy N = 83	Laparoscopy N = 54	Deviation
Number of patients	83	54	
Right-sided localization	42	33	ns
Left-sided localization	32	15	ns
Bilateral localization	8	6	ns
Time since last surgery (months)	96(384/1)	78(228/12)	ns
Hernia size (sm)	5,4(15/3)	4,3(12/3)	ns
Sizes of the hernia gate (sm)	3,5(8/2)	3,7(10/2)	ns
Lowering the hernial sac into the scrotum	14	6	ns

**Table 1.**

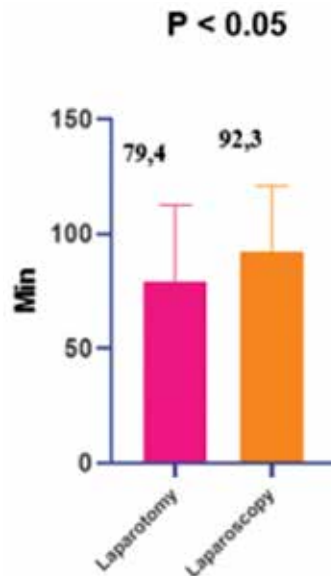
Patient indices without a statistically significant difference ( $p = ns$ )

	Laparotomy N = 83	Laparoscopy N = 54	Deviation
Number of patients	83	54	
Age (years)	59,6 (88/17)	50,9 (81/19)	$P < 0.05$
Concomitant pathology	58	12	$P < 0.05$
Reversibility of the hernia into the abdominal cavity	65/18	51/3	$P < 0.05$
The presence of previous surgical interventions in the abdominal cavity	37	12	$P < 0.05$
Hernia recurrence	25	4	$P < 0.05$
Plastic with synthetic mesh "Ultra PRO"	21/62	54	$P < 0.05$
Duration of surgery (min)	79,2(195/30)	92,3(160/30)	$P < 0.05$
Duration of analgesic therapy in the postoperative period	3,3(8/1)	2,4(5/1)	$P < 0.05$
Duration of stay after surgery	4,6(16/1)	3(6/1)	$P < 0.05$

**Table 2.** Indicators of patients with the revealed statistical difference ( $p < 0.05$ )

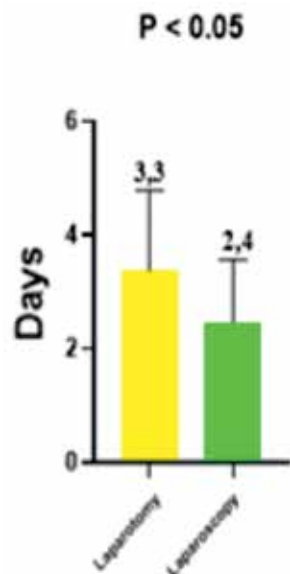
**Figure 2.**

Diagram of comparative analysis of the indicator of the duration of the operation of 2 groups



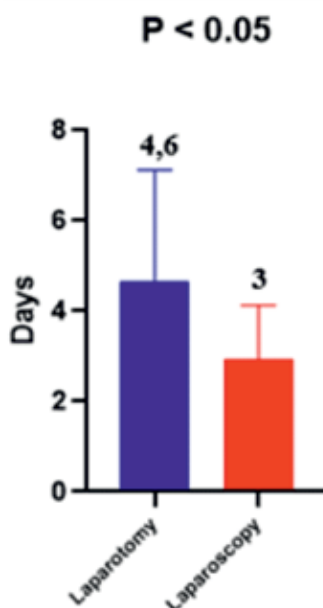
**Figure 3.**

Diagram of comparative analysis of the duration of analgesic therapy after surgery for 2 groups



**Figure 4.**

Diagram of comparative analysis of the indicator of the duration of the patient's stay in the hospital after surgery for 2 groups



According to the index of reducibility of the hernial protrusion into the abdominal cavity in patients of group 1, out of 83 patients, in 65 the hernial protrusion was reduced into the abdominal cavity, in 18 patients there was the inappropriateness of the hernial protrusion. In patients of group 2, out of 54 patients, in 51 patients, the hernial protrusion was reduced into the abdominal cavity, in 3 patients there was an inappropriateness, which indicates the presence of a statistical difference ( $p < 0.05$ ) (Table 2).

Out of 83 patients in group 1, 37 had previous surgical interventions in the abdominal cavity; in patients of group 2, 12 of 54 patients had previous surgical interventions in the abdominal cavity, which indicates the presence of a statistical difference ( $p < 0.05$ ) (Table 2).

Hernia recurrence in patients of group 1 was observed in 25 out of 83 patients; in group 2, hernia recurrence was observed in 4 out of 54 patients, which indicates the presence of a statistical difference ( $p < 0.05$ ) (Table 2). Hernia repair using a synthetic mesh «Ultra PRO» made of composite material monocryl-prolene, in patients of group 1 - out of 83, 21 patients were performed; that regarding group 2, mesh hernia repair was performed in all 54 patients, which indicates the presence of a statistical difference ( $p < 0.05$ ) (Table 2).

The average duration of the operation (minutes) in patients of group 1 is 79.2, the longest operation lasted 195 minutes, the least lasting 30 minutes. In patients of group 2, the average duration of the operation was 92.3 minutes, the longest operation lasted 160 minutes, the least lasting 30 minutes, which indicates the presence of a statistical difference ( $p < 0.05$ ) (Fig. 2).

Analgesic therapy in the postoperative period in patients of group 1 was carried out on average for 3.3 days. The most prolonged analgesics were prescribed within 8 days, the least long - within 1 day. In group 2 patients, analgesic therapy was carried out on average for 2.4 days. The most prolonged analgesics were prescribed within 5 days, the least long - within 1 day, which indicates the presence of a statistical difference ( $p < 0.05$ ) (Fig. 3).

With regard to the length of stay of the patient in the hospital after the operation, the patients of group 1 - needed to be in the hospital for an average of 4.6 days. The longest patients stayed in the hospital after surgery for 16 days, the least long for 1 day; Patients in group 2 - needed to be in the hospital for an average of 3 days. The longest patients stayed in the hospital after surgery for 6 days, the least long for 1 day, which indicates the presence of a statistical difference ( $p < 0.05$ ) (Fig. 4).

During the observation period, postoperative complications were not observed in any group.

## Conclusion

Based on a comparative analysis of the indicators of patients in both groups, it can be concluded that the duration of the operation for laparoscopic hernia repair is 92.3 minutes, significantly more than with traditional methods, which is 79.4 minutes (Fig. 2).

Despite this, the duration of analgesic therapy in the postoperative period with laparoscopic hernia

repair is 2.4 days, and the duration of hospital stay after surgery is 3 days, much less than with traditional methods, in which the duration of analgesic therapy in the postoperative period is 3, 3 days, and the duration of hospital stay after surgery is 4.6 days. (Fig. 3, 4). This analysis suggests that laparoscopic hernioplasty has an advantage over traditional methods.

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