

Results of Surgical Treatment of Inguinal Hernias

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Abstract Surgeries for inguinal hernias (IH) are among the most common elective surgical interventions. More than 20 million inguinal hernioplasties are performed annually worldwide. Most patients with IH belong to the working-age population. Therefore, the treatment of IH has a great socioeconomic burden on healthcare systems worldwide. Over the past 50 years, approaches to surgical treatment of IH have undergone significant changes. Work on improving the tactics of treating such patients is constantly ongoing. Our goal was to analyze the latest reviews, meta-analyses and clinical guidelines for the management of patients with IH. As a result of the work, it was established that the etiopathogenetically justified treatment options for IH are tension-free hernioplasties using a mesh implant (Lichtenstain operation, the proposed technique). When choosing a surgical option, an integrated approach should be used, taking into account the type of hernia, gender and age of the patient. Tension hernioplasties are undesirable and can be used only in exceptional cases. We also considered the main complications of surgical treatment of GPO, methods of their prevention and management.

Keywords Inguinal hernia, Inguinal hernia, Hernia management, Complications of hernioplasty, Recommendations

1. Introduction

Hernias are one of the most common diseases in surgery. Every year, more than 20 million inguinal hernias are examined in the world, and this indicator makes up 10-15% of all surgical interventions in the abdominal cavity. Researchers have different opinions about the size and method of hernioplasty for hernias. Differences in the choice of hernioplasty of inguinal hernias mainly depend on the features of etiopathogenesis and the surgical anatomy of the inguinal canal. Postsurgical recurrence of hernia after local tissue repair has remained high for many decades, ranging from 13% to 42.5% [1,4,7].

Unsatisfactory results of the treatment of inguinal hernias by traditional methods have become the reason for the development and implementation of various methods of inguinal canal plasticity with the use of implants. Among them, the method of I. Lichtenstein, expressed in the prosthetics of the back wall of the canal with polypropylene mesh, occupies a special place. Results of hernioplasty using I. Lichtenstein's method showed a low rate of post-operative complications and recurrences - 0.7-1.5% [5,6,8].

However, with the use of polypropylene mesh, the application of plastic is not always correct.

After the prosthesis is fixed, the internal hernial ring remains unchanged, and the implant used does not have the ability to withstand the increase in intra-abdominal pressure that occurs regularly, as a result of which the internal hernial ring can become a source of hernia recurrence. In addition, I.

Lichtenstein's plastic method does not change the size of the gap, as a result of which the load on the implant increases in the next period after the examination, and as a result, in some cases, it can lead to failure of the sutures and recurrence of the hernia.

From our side, the technique of hernioplasty with the use of a polypropylene implant was developed and put into practice.

2. Material and Methods

During the period from January 2023 to January 2024, 102 patients with inguinal hernia were examined. All patients were divided into three groups. In particular, 36 patients who entered the clinical comparison group (CCG) underwent plasty of the back wall of the inguinal canal using autotissues, 23 patients of the I treatment group (TG I) underwent I. Lichtenstein examination, 43 patients of the II treatment group (TG II) were offered hernioplasty method was used.

The selection criteria were as follows: male patients aged 20 to 70 years, unilateral nature of the lesion, experience of the surgeon in performing each method of examination for at least 3 years, the duration of long-term follow-up is not less than 1 year, control directly in the clinic (not by phone or mail) inspection.

The following were selected as clinical criteria to objectively assess the quality of treatment of patients of all groups: technical complexity of intervention (duration of examination), safety of examination (complications), duration of treatment (duration of hospital (inpatient) treatment); in the long term –

reliability (number of repetitions) and rehabilitation speed (time to return to full physical activity).

The duration of examinations with traditional methods was much longer than the method of hernioplasty proposed by us and the method of I. Lichtenstein. The average duration of examination in CCG was 59.9 ± 15.2 min., in TG I - 50.3 ± 12.2 min., and in TG II - 56.2 ± 8.7 min. Significant differences in duration of surgical intervention were obtained between CCG and TG I and TG I and TG II ($r < 0.05$), while differences between CCG and TG II groups were insignificant ($r > 0.05$).

The average bed-day after local tissue plasty was slightly higher compared to hernia repair with allograft, 8.7 ± 1.4 days, 6.8 ± 0.8 days in TG II and 7.9 in TG I. It was ± 1.1 days. Significant differences were obtained between CCG and TG I ($r < 0.05$), differences between the remaining groups were insignificant ($r > 0.05$).

TG II patients spent less time in the hospital and returned to work sooner. Rehabilitation of patients after I. Lichtenstein's examination, both in light and heavy drinking, is faster than traditional examinations, and a little longer than the proposed method.

In patients whose activity is not related to physical activity, the smallest indicators for the criterion such as rehabilitation period (time of inability to work) were observed after plastic surgery by our proposed methodology and made an average of 12.3 ± 2.3 days. The duration of disability in TG I was 13.1 ± 3.2 days, and in TG II it was 16.9 ± 4.6 days. Significant differences were obtained between CCG and TG I, and between CCG and TG II groups ($r < 0.05$), differences between TG I and TG II were insignificant ($r > 0.05$).

In patients whose activity is related to physical activity, the lowest indicators of rehabilitation period (time of incapacity for work) were also observed in TG II, on average 17.1 ± 2.8 days, in TG I 19.2 ± 3.6 days and They made 23.1 ± 3.5 days in CCG. Significant differences were obtained between all three groups ($r < 0.05$).

The total number of complications after conventional examination was 28.2%, after I. Lichtenstein's examination - 20.4%, and after the author's methodology - 19.1%.

The structure of complications was different in the studied groups of patients. No surgical complications were observed in any hernioplasty. Complications after the traditional analysis, compared to both the proposed methodology and I. Lichtenstein's analysis, are more defined.

The rates of hernia recurrence were divided in the following order: after traditional examinations - 9.6%, after I. Lichtenstein's examination - 2.9%, after the author's methodology - 2.1%.

The values of post-examination complications and recurrences are expressed as relative risk reduction (RRR), absolute risk reduction (ARR) and the number of patients who need to be treated with a specific method during a certain period of time to achieve a certain effect or prevent an adverse outcome in one patient (PWNT), which are or those who have most convincingly demonstrated the effectiveness of this methodology. All obtained quantities are oscillating within the confidence (IV) interval values.

3. Results and Their Discussion

The clinical effectiveness of surgical treatment of inguinal hernias according to the criteria of functional and anatomical disorders was as follows.

When comparing CCG and TG I, the obtained RRR estimates are 27.4%, II (17.8-39.3) and ARR 7.8%, PWNT - 12.8 (95% II 6.9-22.2). When comparing CCG and TG II, the obtained RRR estimates were 32.3%, II (21.9-45.2) and ARR 9.1%, PWNT - 10.9 (95% II 5.5-19.7). Comparing TG I and TG II, the obtained estimates of RRR are 6.3%, II 95% (2.2-13.1) and ARR 1.3%, PWNT - 76.9 (95% II 58.8-92.9).

The obtained results confirm the decrease in the number of complications in the treatment using the proposed methodology and I. Lichtenstein's analysis, compared to traditional methods of treatment.

The clinical effectiveness of surgical treatment of inguinal hernias in terms of post-examination recurrences was as follows. When comparing CCG and TG I, the obtained estimates of RRR are 69.8%, II (53.4-86.2) and ARR 6.7%, PWNT - 14.9 (95% II 8.4-24.7). When comparing TG and TG II, the obtained estimates of RRR are 78.1%, II (60.8-95.4) and ARR 7.5%, PWNT - 13.3 (95% II 6.9-22.2). When TG I and TG II were compared, RRR estimates were 27.6%, II 95% (18.6-40.5) and ARR 0.8%, PWNT - 125 (95% II 103.1-146.9).

The obtained results confirm the statistically significant effectiveness of the proposed methodology and I. Lichtenstein's examination over traditional methods of treatment.

Thus, in terms of complexity, safety, rehabilitation duration, reliability, the results of the methods of hernioplasty, in which a polypropylene mesh is applied, turned out to be better. The advantages of the methodology we proposed before traditional methods consisted of statistically significant ($R < 0.05$) indications, including - a smaller duration of hospitalization, faster rehabilitation of patients, a smaller number of complications and recurrence.

Comparing the proposed methodology and I. Lichtenstein's analysis, the differences are not so significant. In terms of criteria such as complexity (examination duration), I. Lichtenstein's analysis is superior, and in terms of rehabilitation speed (return to full physical load) the author's methodology is superior.

The introduction of a new method into the practice of treating inguinal hernia made it possible to reduce the percentage of early and long-term complications after the examination, and most importantly - to reduce the frequency of recurrences.

The use of the developed methodology made it possible to completely restore the functional state of the front wall of the abdomen, reduce the duration of hospital treatment, and restore the ability to drink faster in patients who are engaged in light and heavy physical exertion.

Relatively low injury rate, rapid medical and social rehabilitation of patients, pathogenetic basis of this type of plastic surgery, universality of the methodology - all this should help the new method to become more widespread in

the surgical practice of inguinal hernias.

Thus, the use of examinations with the use of synthetic alloplasts allows to significantly improve the results of surgical treatment of inguinal hernias, rather than the method of cutting the hernia through local tissues. Chov hernia cutting and plastic surgery according to the proposed method, I. Lichtenstein examination and traditional methods of hernioplasty, with a lower rate of complications and recurrences in the immediate and long periods after the examination. Compared to the local tissue hernioplasty method, the proposed method helps to reduce the length of stay in the hospital, temporary incapacity for work, and reduces the rehabilitation period of patients related to work.

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