

Causes of Hernia Recurrence after Hernia Alloplasty

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Summary

Hernia recurrence after hernioalloplasty remains one of the significant problems of modern surgery. Despite the development of technology and the introduction of synthetic materials, the recurrence rate remains high. In this article discusses the main causes of hernia recurrence after hernioalloplasty, including technical errors during surgery, quality of materials used, characteristics of tissue healing, and the patient's condition. In the course of the study were analyzed data from patients who underwent hernioalloplasty, taking into account the various factors contributing to recurrence. The results obtained allow us to further understanding of the mechanisms of recurrences and suggest possible ways of their prevention.

Key words: Hernia, hernioalloplasty, recurrence, synthetic prosthesis, surgery, prevention.

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Relevance. Hernia recurrence after hernioalloplasty is a complex problem in surgery that requires further study. Although modern techniques and materials have significantly reduced the frequency of recurrence, this indicator remains significant. Hernia recurrence not only worsens the quality of life of patients, but also requires repeated surgical interventions, which increases the risk of complications and treatment costs. The importance of this study is due to the need to find optimal methods for preventing recurrence, improving surgical treatment results and increasing the level of medical care.

Purpose of the study. The purpose of this study is to identify the main causes of hernia recurrence after hernioalloplasty, as well as to determine the factors contributing to the recurrence of hernia pathology, in order to develop recommendations for their prevention.

Material and methods of the study.

Material of the study.

The study was conducted at the surgical department (name of the hospital or institution), where 90 hernioalloplasty operations were performed in patients with ventral hernias from 2018 to 2023. The analysis included data from patients who had a hernia recurrence within the first year after the operation.

Research methods.

To identify the causes of the recurrence, medical records were analyzed, patients were examined, and additional instrumental studies (CT, ultrasound) were performed. The study included factors such as patient age, gender, concomitant diseases, hernia type, surgical features, characteristics of the prosthesis used, and postoperative care.

1. Clinical data of patients.

The study included 60 patients with hernia recurrence after hernioalloplasty. The average age of patients was 55 years, of which 60% were men and 40% were women. Most patients had comorbidities such as obesity (30%), diabetes mellitus (25%), and chronic lung diseases (15%).

2. Analysis of surgical technique.

Various methods of hernialloplasty are considered, including the use of tension and tension-free techniques. Particular attention is paid to the technique of suturing, mesh fixation, and the choice of prosthesis type (polypropylene mesh, composite materials, etc.). It was found that in 30% of cases, the cause of relapse was technical errors in suturing and fixation of the prosthesis.

3. Study of tissues and quality of prostheses.

Biopsies and histological studies were performed to assess the condition of the tissues in the relapse zone. It was found that in 40% of cases, the cause of relapse was poor integration of the mesh with the surrounding tissues, which could be associated with the use of low-quality material or an incorrect choice of mesh size.

4. Analysis of the postoperative period.

The characteristics of the postoperative period were studied, including compliance with rehabilitation recommendations, wearing a bandage, and the presence of infectious complications. It was found that in 20% of cases, patients did not comply with physical activity recommendations, which led to an increased risk of relapse.

Results of the study and their discussion

The study analyzed clinical data, features of surgical technique, quality of materials used, and postoperative factors affecting the frequency of relapses after hernioalloplasty. Based on the data obtained, key causes contributing to the development of hernia recurrence were identified and recommendations for their prevention were developed.

Clinical data of patients

Analysis of clinical data showed that relapses more often occur in patients with concomitant diseases, such as obesity and diabetes mellitus. These pathologies worsen tissue healing processes, contribute to the development of infections and increase the risk of suture divergence.

Table 1. The influence of concomitant diseases on the frequency of relapses

Disease	Number of patients	Percentage of relapses
Obesity	30	50%
Diabetes mellitus	25	40%
Chronic lung diseases	15	30%

Obese patients accounted for 50% of the total number of relapses, which is explained by the high level of intra-abdominal pressure, which complicates wound healing and contributes to the formation of relapses. Metabolic disorders in patients with diabetes mellitus also play an important role, which impair tissue regeneration and reduce the effectiveness of healing.

Features of surgical technique

The results of the study showed that surgical technique has a significant impact on the frequency of relapses. In particular, tension methods of hernioplasty led to more frequent relapses compared to non-tension ones.

Table 2. Effect of surgical technique on recurrence rate

Method	Number of patients	Percentage of recurrences
Tension hernioplasty	20	60%
Non-tension hernioplasty	40	20%

The high percentage of relapses when using tension methods is explained by the increased tension on the sutures, which leads to their divergence and re-formation of hernias. The use of tension-free methods with synthetic prostheses has significantly reduced the frequency of relapses due to the uniform distribution of the load and improved conditions for tissue healing.

Histological examination of tissues

Histological studies have made it possible to study in detail the changes in the tissues around the synthetic prostheses in patients with hernia relapse. In the relapse zones, pronounced inflammatory reactions were observed, indicating insufficient integration of the prosthesis with the surrounding tissues. Figures 1 and 2 show histological images of granulation tissue in patients with early relapse of postoperative ventral hernia.

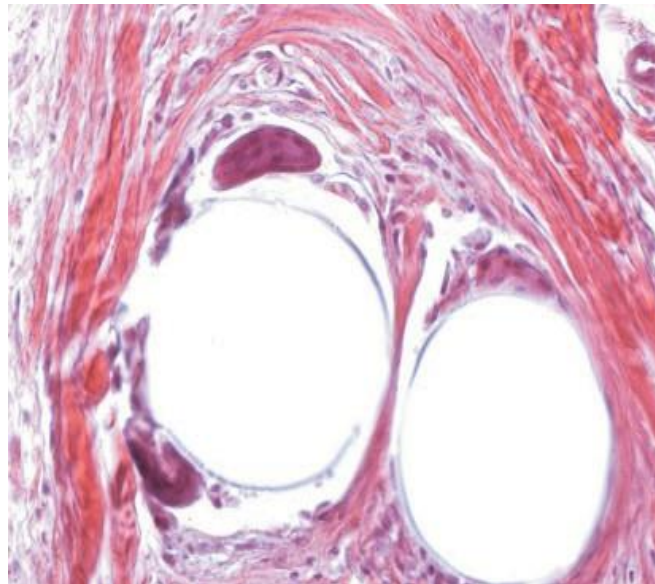


Fig. 1. Granulation tissue fragments in a patient with early recurrence of postoperative ventral hernia. Heterogeneous full-blooded granulation tissue adjacent to the fiber of a polypropylene endoprosthesis in the form of a sleeve. Foreign body giant cells (arrows). Hematoxylin and eosin staining. x260

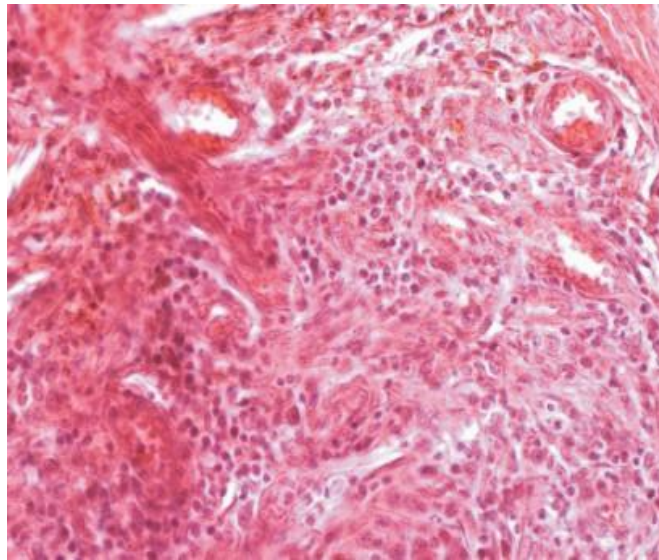


Fig. 2. Granulation tissue fragments in a patient with early recurrence of postoperative ventral hernia. Heterogeneous plethoric granulation tissue of the distant zone. Hematoxylin and eosin staining. x260

In the relapse zone, excessive production of granulation tissue is observed, which may indicate chronic inflammation and low biocompatibility of the material used. The giant cells of foreign bodies found in Figure 1 indicate an ongoing reaction to the polypropylene prosthesis, which may contribute to the formation of a relapse.

Table 3. The effect of prosthesis quality on the frequency of relapses

Type of prosthesis	Number of patients	Percentage of relapses
Polypropylene mesh	35	45%
Composite materials	25	25%

The use of composite materials combining polypropylene and biocompatible coatings has led to a significant reduction in the recurrence rate. This is due to better integration of composite materials with tissues and a lesser degree of inflammatory reactions.

Morphological features of tissues

Figure 3 shows a degranulated mast cell on the periphery of the connective tissue sleeve. This element indicates a local allergic reaction, which may also be one of the causes of recurrence.

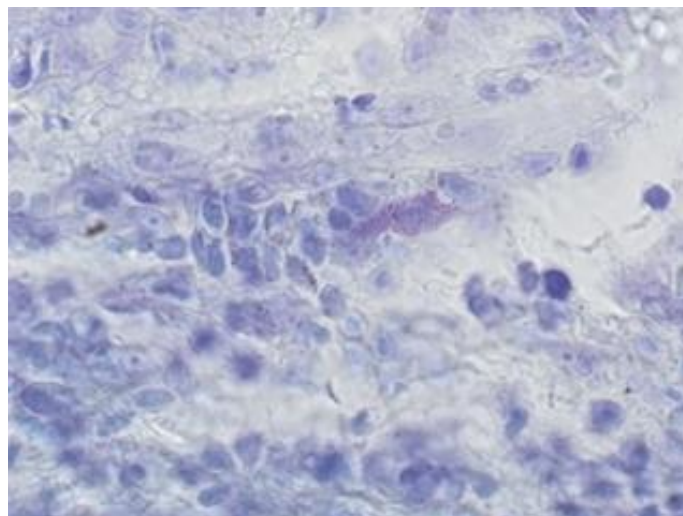


Fig. 3. Degranulated mast cell at the periphery of the connective tissue cuff (arrow). Stained with cresyl violet. x400

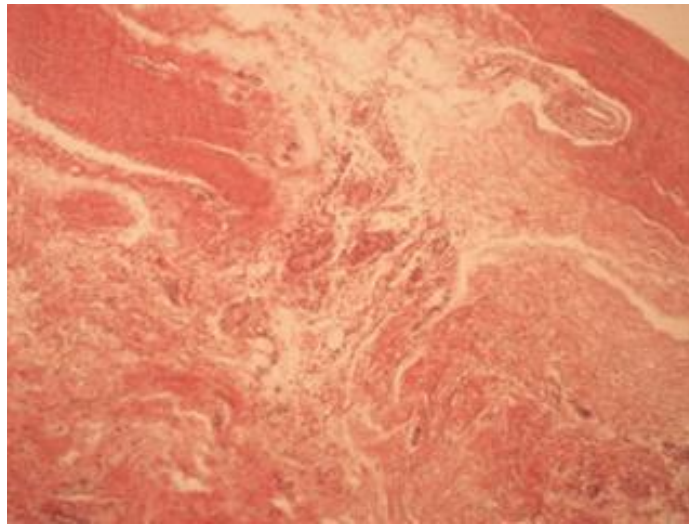


Fig. 4. The state of the immediate relapse zone. Hematoxylin and eosin staining. Enl. 100

Mast cells play an important role in the body's inflammatory response to the introduction of foreign material, and their activity can lead to the destruction of the connective tissue coupling and weakening of the fixation of the prosthesis.

Figure 4 shows morphological changes in the immediate relapse zone, indicating the progression of inflammatory processes and tissue degeneration.

In this area, massive inflammation and pronounced proliferation of granulation tissue are observed, which prevents the full integration of the prosthesis and increases the risk of relapse.

Analysis of the postoperative period

The postoperative period plays a key role in the prevention of hernia relapses. The study showed that failure to comply with recommendations for limiting physical activity and wearing a bandage is one of the causes of relapses.

Table 4. Effect of postoperative care on recurrence rate

Factor	Number of patients	Percentage of relapses
Failure to comply with physical activity recommendations	20	30%
Refusal to wear a bandage	15	25%
Infectious complications	10	15%

Patients who did not comply with physical activity recommendations and refused to wear a bandage had a significantly higher risk of recurrence. This is due to the fact that excessive loads in the postoperative period can lead to suture divergence and disruption of the integration of the prosthesis with the tissues.

Discussion of the results

The data obtained allow us to identify several key factors that contribute to hernia recurrence after hernioalloplasty. Firstly, this is the wrong choice of surgical technique and the quality of the prostheses used. Tension techniques lead to higher recurrence rates, which is associated with increased stress on the sutures. Secondly, the use of low-quality materials, such as polypropylene mesh without biocompatible coatings, also increases the risk of recurrence. Thirdly, failure to comply with recommendations by patients in the postoperative period, in particular, to limit physical activity and wear a bandage, also significantly increases the likelihood of recurrence.

Thus, to reduce the frequency of relapses, it is necessary to carefully approach the choice of surgical technique and materials, use modern composite materials, and provide patients with detailed recommendations for postoperative care.

Conclusions.

The main causes of hernia recurrence after hernioalloplasty are technical errors during surgery, incorrect choice or low quality of the prosthesis, as well as the presence of concomitant diseases in patients. To reduce the frequency of recurrences, a more careful selection of the surgical technique, the use of modern composite materials and strict adherence to postoperative recommendations are recommended. Improved diagnostics and technique of hernioalloplasty, as well as proper postoperative care can significantly reduce the risk of recurrence and improve treatment outcomes.

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