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ANALYSIS OF POSTOPERATIVE COMPLICATIONS IN REPAIR OF INCISIONAL VENTRAL HERNIAS USING ALLO-AND AUTOGRAFTS

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ABSTRACT — The article provides a multicenter retrospective analysis of postoperative complications in patients after ventral hernias repair. The study went on for 10 years and included 628 patients divided into 2 groups. The first group included 510 patients operated on using polypropylene implants (mesh density 60g/m²). In the second group (118 patients) a de-epithelized autodermal graft prepared according to the authors' technology was applied. Clavien-Dindo classification was used to describe postoperative complications. The total number of complications in the first group was 22.2%, in the second group — 2.5% ($p < 0.01$). In the analysis of complications in all patients operated on using both allo- and autograft, the most frequent complications in the form of seroma were noted when implants using the one lay technique — 22.3% ($p < 0.05$) were installed. The autodermal de-epithelized graft used in ventral hernia plastics, regardless of their localization and size, especially in relapses after alloplasty, may be a good alternative to synthetic grafts.

KEYWORDS — incisional hernia, postoperative complications, abdominal wall repair, mesh implants, autodermal graft, recurrent hernia.

INTRODUCTION

Intervention for incisional hernia is the most commonly performed abdominal surgery, which requires extremely high economic costs. The risk of complications after hernioplasty is a key parameter in estimating the risk/benefit ratio for evaluating the technique. According to hospitalization studies, one in five patients who underwent incisional hernia plastic in the USA was re-hospitalized within a year, with the majority of repeated hospitalizations occurring in the 30-day post-surgery period [1]. The analysis, published in the Journal of Surgical Research, indicates that

many patients who are re-hospitalized with complications after surgical hernia plastics are often ignored, leading to a constant underreporting of complications [2, 3, 4]. Hernia plastic includes two types of materials: synthetic and biological implants. Synthetic mesh remain in the body for life, provide adequate mechanical support, but are associated with postoperative complications such as infection. Biological implants are obtained from xenografts or their own tissues less susceptible to infections; however, their mechanical strength may be too weak depending on the characteristics of the hernial defect [5, 6, 7]. Unfortunately, recurrent hernia is itself a risk factor for repetition of subsequent surgeries, meaning that many patients are in the vicious circle of numerous failed surgeries. The risk of complete mesh excision may be significant, often requiring extensive lysis of adhesions with a risk of intestinal damage. In addition, if the mesh is well embedded, there is a risk of destruction of the natural components of the abdominal wall, which makes subsequent reconstruction difficult [8, 9]

Purpose

The purpose of the study was to analyze early and late postoperative complications when using allo- and autografts in the surgery of incisional ventral hernias.

MATERIALS AND METHODS

A multicenter retrospective study of the treatment outcomes in 628 patients was conducted. The first group — 510 patients were operated with polypropylene implants (polypropylene, mesh density 60 g/m²) and the second group — 118 patients using a de-epithelized autodermal graft prepared according to the author's method. To prepare the graft, the skin was taken from the surgical access area of the same patient, mechanically de-epithelized and impregnated with an antibiotic solution and an oxygen-containing preparation. The groups were comparable in sex, age and pathology. The arrangement of implants in the first group was as follows: one lay — 310, sub lay — 190 and in lay — 10, in the second group: one lay — 61, sub lay — 55, and in lay — 2. According to the EHS classification in the first group, the distribution was as follows: M2W3R1 — 133, M3,4W3R1 — 121, M4,5W3R1 — 89, L1W3R2 — 66, L3W2R1 — 54,

L4W3R1 — 47. In the second group: M2W3R1 — 41, M3,4W3R1 — 37, M4,5W3R1 — 18, L1W3R2 — 11, L3W2R1 — 7, L4W3R1 — 4. All patients with recurrent hernias after alloplasty were operated with autografts. The study lasted 10 years. Clavien-Dindo classification was used to describe postoperative complications. Statistical processing of the digital material of the dissertation was carried out using the STATISTICA Version 6 program. In the process of statistical analysis, quantitative values are indicated as the average statistical value (M) ± standard quadratic deviation (SD). Statistical processing of digital data when determining the validity of differences in quantitative values of results is performed using Student's t-test.

RESULTS AND DISCUSSION

Early complications in the first group were distributed as follows: seromas — 26, hematomas — 11, suppuration — 6, paresis — 5 (9.44%). In the second group, early complications were represented by only 2 seromas (1.7%). Late complications in the first group were distributed as follows — fistula formation — 15, infiltrates and abscesses — 7, graft detachment and migration — 10, neuralgia and paresthesia — 18, recurrence — 15 (12.75%). Late complications in the second group were presented by 1 case as a relapse 2.5 years after surgery (0.8%). The total number of complications in the first group was 22.2%, in the second group — 2.5%. When analyzing complications using polypropylene grafts according to the one lay method — 101 (19.8%), sub lay — 13 (2.5%), in lay — no complications were noted. All complications of the second group arose in the patients operated on by the one lay technique. In the analysis of complications in all patients operated with both allo- and autografts, the most frequent complications in the form of seroma were noted when implants were installed using the one lay technique — 22.3%. When implants were installed using the sub lay technique, complications in the form of hematomas and suppuration were noted in single cases (0.8%), and the most frequent complication in this case was GI paresis — 10.2%. Suppurative processes in the form of fistulas, infiltrates and chronic abscesses in the first group were noted in 5.4% of cases. General data are presented in the Table 1.

Analysis of the results of treatment of ventral postoperative and recurrent hernias using allo- and autografts in the study groups showed that sub lay is the optimal method of their fixation. The largest number of complications was noted in the one lay technique using a polypropylene implant. The obtained data correlate with the results of foreign studies [10]. During the analysis, it turned out that the use of an autograft, regardless of the location of the implant,

Table 1. Analysis of postoperative complications in comparison groups

Degree of complications by Clavien-Dindo	Study Groups		P
	I group (n = 510) abs (%); (M ± SD)	II group (n = 118) abs (%); (M ± SD)	
I	29 (5,6%)	2 (1,7%)	< 0,05
II	18 (3,5%)	abs	-
IIIa	16 (3,1%)	1 (0,85%)	< 0,05
IIIb	27 (5,3%)	abs	
IVa	17 (3,3%)	abs	-
IVb	7 (1,4%)	abs	-
V	abs	abs	-
Total	114 (22,2%)	3 (2,5%)	< 0,01

gives a minimum number of complications both in the early and late postoperative period.

CONCLUSION

The autodermal de-epithelized graft used in ventral hernia plastics, regardless of their localization and size, especially in relapses after alloplasty, may be a good alternative to synthetic grafts.

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