such a disease as myocardial infarction affects not an isolated region, but the heart muscle as a whole.

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Macroscopic and Functional Assessment of the Efficacy of Ovary Regeneration with Fibrin Glue and Various Suture Materials Following its V-Shaped resection

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Reconstructive surgery on the ovaries involves a risk of postoperative adhesions and tuboperitoneal sterility. V-shaped resections and restoration of the ovaries result in sterility because of adhesions in one third of patients [4]. The efficacy of surgery depends on the suture material used, on strict adherence to reconstructive surgery principles, and on the surgical technique. There are essential differences in the methods of reconstructive surgery on the ovaries; postoperative adhesions are less frequent after V-shaped resection of the ovary and laser hemostasis then after microsurgical restoration of this organ [3,6].

Published data [7] and our clinical and experimental findings [1,2] provide evidence of the efficacy of fibrin glue in reconstructive surgery on the uterine tubes. Still, we have not come across studies describing fibrin glue application in reconstructive surgery on the ovaries.

The present research was aimed at investigation of the effects of fibrin glue and various suture materials on ovarian tissue.

TABLE 1. Macroscopic Changes of Rabbit Ovaries after Reconstruction with FI-1, prolene, and catgut

Group	Ovarian abnormalities		
	pronounced inflammation	sclerotic changes	total
1. FG-1, n=30	1 (3.3%)	2 (6.7%)	3 (10%)
2. Prolene, n=20	1 (5%)	3 (15%)	4 (20%)
3. Catgut, n=10	3 (30%)	4 (40%)	7 (70%)

MATERIAL AND METHODS

A total of 60 experiments on 30 chinchilla rabbits weighing 2.5-3.5 kg were carried out. In group 1 fibrin glue (FG-1) was used for reconstructivon of the ovary in 30 experiments, in group 2 prolene 7/0 Eticon suture material was used in 20 experiments, and in group 3 catgut 3/0 with an atraumatic needle was used in 10 experiments. The operations were carried out under general anesthesia with intramuscular diazepam (1.6 mg/kg) and droperidol (0.83 mg.kg) premedication and calypsol (ketamine) (50 mg/kg) narcosis. The duration of anesthesia was 1 to 2 h. Calypsol was additionally injected as needed during surgery. The animals were fixed in a supine position on the table. The wool on the abdomen was shaved and the operative field washed with soap solution and treated with iodonate and ethyl alcohol. The abdominal cavity was then opened by two

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TABLE 2. Ovarian Size and Mass after V-Shaped Resection and Restoration with FG-1, Prolene, and Catgut (M±m)

Group	Ovarian size (cm)			Ovarian mass, g
	length	width	thickness	
1. FG-1, n=30	1.39±0.04	0.44±0.04	0.33±0.02	0.20±0.01
2. Prolene, n=20	1.35±0.04	0.41±0.04	0.31±0.03	0.18±0.01
3. Catgut, n=10	1.23±0.05	0.39±0.03	0.31±0.02	0.13±0.007

inferolateral longitudinal incisions 4-5 cm long. Different surgical methods were used on each side to provide controls for each case. V-shaped resection with a blade was carried out, followed by double-row suturing [5] on one side. On the other side the ovary was restored with fibrin glue without sutures. Several drops of the glue were applied to the dissected site and the tissues were tightly pressed to each other for 2-3 min. More glue was then applied to the stuck site in order to level the resected surface of the ovary. In no cases were any extra methods used for bleeding arrest. The anterior abdominal wall was restored layer-by-layer with a knotless catgut suture (the first layer comprised the peritoneum, aponeurosis and the muscle, the second layer the skin), the skin was treated with iodonate, and the animals were caged.

Three to four weeks after the operation the animals were mated with fertile males and killed 3 weeks after pregnancy onset.

Repeated laparotomy was carried out to examine the macroscopic changes in the small pelvis and the severity and number of adhesions. Ovarian size and mass were measured. The counts of corpora lutea in the ovaries and of the fetuses in the uterine horns were estimated to derive the nidation index.

The data were statistically processed using the Fisher-Student test.

RESULTS

The macroscopic changes observed in the rabbit ovaries are summarized in Table 1.

As is seen from the table, macroscopic changes in the form of inflammatory and sclerotic disorders were more frequent in the ovaries that were restored with catgut suturing (in 70% of cases) and were much more rare in groups 1 and 2 - 10 and 20%, respectively ($p<0.001$). The ovaries restored without suturing looked best of all, differing favorably from the other two groups ($p<0.05$ and $p<0.001$, respectively).

Table 2 shows that measurements of ovarian size and mass after restoration by various methods have revealed a significant reduction of these parameters after catgut suturing as against the other two methods (fibrin glue or prolene). These parameters trended to decrease in the group where prolene 7/0 was employed vs. sutureless restoration with the glue, although no significant difference between these two groups was detected.

The incidence and tightness of adhesions were assessed using a point system developed by the authors [2]; the results are presented in Table 3.

Ovarian reconstruction with catgut was associated in the majority of cases (in 7 out of 10) with the formation of adhesions; restoration of the ovaries with prolene also resulted in adhesions in 50% of cases; after ovarian restoration with fibrin glue, adhesions were more rarer (in 11 of the 30 cases, or just 36.6%). The adhesions were the least tight in the same group where fibrin glue was used, as against the other two groups, in which prolene and catgut were employed.

Studies of the generative function in group 1 animals revealed fetuses in 23 uterine horns of the 30 examined, in group 2 in 14 of the 20 examined horns, and in group 3 in 4 of the 10 horns examined. accounting, respectively, for 76, 70, and 40%. The nidation index was higher in groups 1 and 2 than in group 3 (81, 78, and 45%, respectively).

Functional assessment of the efficacy of ovarian reconstruction indicates that application if fibrin glue or prolene does not noticeably influence ovarian function, whereas the use of catgut is conducive to a significant reduction of fertility ($p<0.001$).

Analysis of the experimental findings showed that fibrin glue in comparison with the suturing materials promoted a reduced incidence of sclerotic changes and postoperative adhesions and helped preserve the trend toward ovarian size and mass increment and functional competence. Prolene differs favorably from catgut, the latter material being responsible for marked macroscopic changes in ovarian tissue that were associated with a decrease of ovarian mass and size, an increased incidence of postoperative adhesions, and severe dysfunction of the generative system.

Clinically fibrin glue FG-1 was used in reconstructive ovarian surgery in 7 patients: in 4 after V-shaped resection and in 3 after cystectomy. It is noteworthy that the use of fibrin glue in ovarian reconstruction helped reduce the number of sutures and permitted additional hermetic sealing of the sutures. Control laparoscopy was carried out in 6

TABLE 3. Incidence and Tightness if Adhesions Round the Ovaries in Rabbits after V-Shaped Resection and Restoration with FG-1, Prolene, and Catgut (M±m)

Group	Incidence of adhesions		Tightness of adhesions
	number	%	
1. FG-1, n=30	11	36.6	0.7±0.20
2. Prolene, n=20	10	50	1.05±0.26
2. Catgut, n=10	7	70	2.4±0.53
		P1-2<0.05	P1-2<0.1
		P1-3<0.001	P1-3<0.001
		P2-3<0.001	P2-3<0.05±0.0

patients on days 4-5 after surgery to assess the specific features of reparative regeneration processes. The resected ovarian sites were smooth in 4 patients; adhesion processes were detected in 2. Uterine tubes were clear in all patients. No intra- or postoperative complications were recorded.

The experimental and clinical findings attest to the efficacy of fibrin glue in ovarian reconstruction; this method helps reduce the incidence of postoperative adhesions.

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Measurements of Mechanical Parameters of the Skin in Patients with Lower Limb Varicosity

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Varicosity of the lower limbs is a highly prevalent disease [1], involving not only the vascular system, but the skin integument of the limbs as well, this being associated with venous stasis and microcirculatory disorders. The skin status is usually assessed visually and by palpation. Attention is paid to the skin color, elasticity, and the presence of edema of trophic disorders. However, the clinical methods used for this purpose seem to be subjected and not accurate enough. The importance of an objective characterization of the lower limb skin integument in patients with varicosity is evident, for it permits an adequate assessment of the disease pattern and severity and helps define the treatment policy.

Therefore, the development of accurate methods for the assessment of the skin status is a pressing problem that may be solved when a method is worked out that will yield objective quantitative information about the physical characteristics of the skin.

Measurements of the mechanical parameters of the skin may be used for this purpose. The authors have previously [2, 3] described a method for the assessment of these characteristics that is based on the use of the surface acoustic waves. The method is implemented using an ACA acoustic analyzer for soft tissues. This device has been widely used in medical practice of late: it is used in dermatology for the diagnosis of various skin diseases [4], in cosmetology to define skin type [5, 6], and in surgery to detect the tissues changed by cicatrization.

The aim of the present study was to reveal the diagnostic potentialities of this method in patients with diseases of the lower limb venous system and, specifically, to try to use it to assess the degree of venous insufficiency and the severity of local skin involvement, to detect acute inflammatory changes in the major veins, and to assess the extent of these inflammations.

The ACA apparatus permits measurement of the rate of propagation of surface acoustic waves in the skin; When this rate is known, it is possible to

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