EVALUATION OF FUNCTION AFTER EXPERIMENTAL RECONSTRUCTIVE AND PLASTIC OPERATIONS ON THE UTERINE CORNUA

V. I. Kulakov, L. V. Adamyan, and O. A. Mynbaev UDC 618.12-007.271-089.86-089.84-059:615.362.115.1

KEY WORDS: fibrinogen, uterine cornu, anastomosis

Restoration of potency of the fallopian tubes does not itself indicate their functional efficacy. According to data published by various workers, the frequency of pregnancy after operations for tubular sterility varies within wide limits (15-60%). Many factors are involved: functional insufficiency of the hypothalamo-hypophyseo-ovarian system, disturbance of receptor activity of target organs, disturbance of function or reocclusion of the fallopian tubes. With the aid of microsurgical techniques, it is now possible to improve the results of reconstructive operations for tubular sterility considerably, but they cannot yet guarantee complete freedom from the risk of postoperative adhesions. Several experimental studies of the use of fibrin glue (FG) in the course of plastic operations for sutureless anastomosis of tissues with the aim of reducing the frequency of adhesion formation, have been published in recent years [3-5, 7, 8]. After anastomosis of the oviducts in rabbits with WG, less intensive adhesion formation was observed compared with the traditional method using microsurgery [8]. In operative gynecology FG is effective for hemostasis in diffuse capillary bleeding and sutureless glueing of the tissues. Investigations have been carried out to study the use of biological glue in reconstructive and plastic operations on the genitalia, mainly experimentally [3, 4, 7-9]. The only communications relating to the use of FG in clinical gynecological operations are based on a small number of cases and are contradictory in character [1, 2].

Research into the improvement of operative techniques aimed at restoring the generative function is of great practical importance.

The aim of this investigation was to study the indications for and effectiveness of the use of FG during experimental reconstructive and plastic operations on the fallopian tubes.

EXPERIMENTAL METHOD

Altogether 60 experiments were carried out on 30 mature noninbred albino rats weighing 180-260 g. In 20 experiments FG of Soviet origin (FG-1), developed at the All-Union Scientific Center for Surgery, Academy of Medical Sciences of the USSR, was used and in 26 experiments the preparation "Beriplast" was obtained from the firm of "Bering" (West Germany), and in 16 experiments a microsurgical technique was adopted, using suture material from the firm "Ethicon", namely Prolene 7/0 and 8/0; this constituted the control group. The operations were performed under general anesthesia, with intraperitoneal injection of hexobarbital in a dose of 100 mg/kg body weight. Both uterine cornua were exteriorized into the wound, then divided 1.5-2 cm distally to the base of the uterus. To appose the wound edges in the uterine cornua during anastomosis formation we used protectors made of mark PM-1/42 polyvinyl chloride plastic, with an external diameter of 1.33-2 mm, and a length of 2 cm, which were introduced into the lumen of the stumps of the uterine cornua. The method of sutureless anastomosis using FG consisted of applying FG between the stumps of the uterine cornua, compressing the glued surfaces tightly together, and fixing them for 2-3 min. To increase the strength of the anastomoses, further glueing of the serous membranes of the uterine cornua with FG was carried out. Anastomosis of the stump of the uterine cornu by a microsurgical technique was carried out with eight seromus

All-Union Research Center for Health Care of Mother and Child, Ministry of Health of the USSR, Moscow. Translated from Byulleten' Éksperimental'noi Biologii i Meditsiny, Vol. 111, No. 1, pp. 90-92, January, 1991. Original article submitted April 6, 1990.

0007-4888/91/0001-0119$12.50

TABLE 1. Frequency and Extent of Adhesions in Region of Anastomoses

Group	Method of formation of anastomosis	Number of anastomoses carried out	Intensity of adhesions				Total adhesion formation, per cent
			both uterine cornua involved		one uterine cornu involved		
			multiple adhesions (n)	single adhesions (n)	multiple adhesions (n)	single adhesions (n)	
1-	FG-1 glue	20	—	—	1	3	20
2-	Beriplast	24	—	1	1	2	20.8
3	Control	16	—	1	2	1	31.25

TABLE 2. Frequency of Onset of Pregnancy and Potency of Uterine Cornua After Anastomosis

Group	Method of formation of anastomosis	Total number of uterine cornua (n)	Number of pregnant uterine cornua (n)	Number of nonpregnant uterine cornua (n)	Patency of nonpregnant uterine cornua		
					patent (n)	partially patent (n)	nonpatent (n)
1	FG-1 glue	20	17	3	3		—
2-	Beriplast	24	20	4	2		2
3	Control	16	12	4	3	1	—

cular sutures on a protector, which was left inside the lumen of the uterine cornu. The protector was spontaneously discharged through the natural birth passages 4-5 days after the operation. The anterior abdominal wall was sutured in layers without drainage with 00 catgut. During the experiments the duration of the operation from the skin incision to the final suturing was recorded. The animals were paired with fertile males 2 weeks after the operation. If pregnancy took place, the animals were sacrificed after 3 weeks. Three females which did not become pregnant were sacrificed together with the experimental group. On repeated laparotomy, repair processes were studied in all the divided and reconstructed organs. The state of the postoperative scar on the anterior abdominal wall was assessed and the presence of adhesions determined between the pelvic and abdominal organs and the parietal peritoneum. The intensity and number of adhesions in the region of the anastomoses of the uterine cornua were evaluated. In the absence of signs of pregnancy, mechanical patency of the uterine cornua was determined by injecting a solution of methylene blue.

The results were subjected to statistical analysis by the Fisher—Student test.

EXPERIMENTAL RESULTS

The duration of the operation in the control group was 60 ± 9 min, but when glue of the FG-1 and "Beriplast" types was used, it was 37 ± 5.8 and 35 ± 7.5 min respectively.

The frequency of discovery of adhesions between the parietal peritoneum and the pelvic and abdominal organs when the microsurgical method was used to form an anastomosis was 59%, compared with 46 and 43% when FG-1 glue and Beriplast respectively were used.

The intensity of adhesion formation in the region of the anastomoses, associated with the different methods, is shown in Table 1.

It will be clear from Table 1 that the frequency of adhesion formation when glue of the FG-1 and Beriplast types was used was 20 and 20.8% respectively, much lower than when a microsurgical technique alone is used (31.25%).

Our data on the frequency of adhesion formation between the parietal peritoneum and the pelvic and abdominal organs are thus in agreement with those in [6] but values are a little higher than in [8], when plastic repair of the rabbit oviducts was used as the experimental model. Differences in the results [8] may perhaps be connected with individual characteristics of the microsurgical technique used, and with the use of catgut to suture the anterior abdominal wall, which cannot be recommended.

The frequency of onset of pregnancy in the group of females undergoing operations by a microsurgical technique only was 75%, whereas in groups with anastomosis formed by the use of FG-1 glue and Beriplast it was 85 and 83.3% respectively. The frequency of the onset of pregnancy and the patency of the uterine cornua are shown in Table 2.

In five females, only one uterine cornu was pregnant (one in Group 1, two in each of Groups 2 and 3). Three animals remained completely sterile (one in each group).

In one case nonpatency of the uterine cornu (in the group of anastomoses with "Beriplast") was due to defectiveness of the anastomosis, evidently as a result of mistakes in the experimental technique.

The experimental investigations described above thus showed that sutureless anastomosis with the use of FG has undoubted advantages over anastomosis using a microsurgical technique (less marked adhesion formation and disturbance of patency of the anastomoses, a higher percentage of occurrence of pregnancy).

LITERATURE CITED

1. R. Baumann, M. Volk, and H.D. Taubert, Geburts. Frauenheilk., **46**, No. 4, 234 (1986).
2. H. Ceuppens, Plast. Reconst. Surg., **81**, No. 5, 815 (1988).
3. R. Dargenio, F. O. Ranelletti, C. Cimino, et al., J. Reprod, Med., **31**, No. 10, 961 (1986).
4. R. Dargenio, F. O. Ranelletti, G. Tancredi, et al., Eur. J. Obstet. Gynec. Reprod. Biol., **21**, No. 2, 173 (1988).
5. S. Lindenberg and G. Lauritzen, Ann. Chir. Gynaec., **73**, 11 (1984).
6. H. Missell and B, Larsson, Fertil. Steril., **30**, No. 4, 470 (1978).
7. P. H. Scheidel, D. R. Wallweiener, R. A. Wiedemann, and H. K. Hepp, Fertil. Steril., **38**, No. 4, 471 (1982).
8. E. Schroeder, S. S. Sorensen, H. P. Olesen, and H. Pedersen, Int. J. Fertil., **32**, No. 4, 325 (1987).
9. S. S. Sorensen, E. Schroeder, and H. P. Olesen, Acta Obstet. Gynec. Scand., **66**, No. 7, 583 (1987).

OBITUARY

The Editorial Board of the Journal deeply regrets to announce the untimely death of Academician of the Academy of Medical Sciences of the USSR Artur Viktorovich Val'dman, eminent pharmacologist, member of the Editorial Board of the Journal, and Director of the Institute of Pharmacology, Academy of Medical Sciences of the USSR. Members of the Editorial Board and the Editorial Staff as a whole extend their condolences to Artur Viktorovich's relatives and friends.

Translated from Byulleten' Éksperimental'noi Biologii i Meditsiny, Vol. 111, No. 1, p. 103, January, 1991.

0007-4888/91/0001-0121$12.50