



METHODS FOR THE PREVENTION OF POSTOPERATIVE ADHESIONS IN GYNECOLOGY

Sadikova D. R.,

Department of Obstetrics and Gynecology of Tashkent Medical Academy.

Oxunova Sh. B.

Department of Obstetrics and Gynecology of Tashkent Medical Academy.

Abstract

One of the urgent problems in gynecological and abdominal surgery is the adhesion process in the abdominal cavity and in the small pelvis in women. According to the literature, the frequency of adhesion formation after gynecological operations ranges from 55 to 100%. The main cause of adhesion is trauma to the mesothelial layer of the peritoneum, which is observed in general abdominal and gynecological surgery, inflammatory processes in the abdominal cavity and in the small pelvis in women and endometriosis.

Keywords. abdominal cavity, gynecological, inflammatory processes.

Pelvic adhesions seen in gynecological patients are factors of infertility, ectopic pregnancy, pelvic pain, and intestinal obstruction.

Such surgical interventions as ovarian cystectomy, myomectomy, surgical treatment of endometriosis, adhesiolysis, tube surgery, including ectopic pregnancy, often lead to the formation of a postoperative adhesion process.

An increase in life expectancy and, accordingly, an increase in surgical interventions lead to an increase in the incidence of adhesive complications with subsequent socio-economic costs. American analysts have calculated the costs of treating adhesions complicated by intestinal obstruction, infertility and pelvic pain. These costs amounted to approximately \$ 1.2 billion over the year. It is also estimated that potential global adhesion prevention costs more than \$ 500 million annually. Thus, it is concluded that adhesions are an expensive problem.

(1,5)

Numerous experimental and clinical studies are devoted to the study of the adhesive process in surgery and gynecology. From the analysis of literature sources, the following idea of the evolution of adhesions is formed: the formation of fibrinous adhesions is a protective reaction of the body in response to infection, trauma, chemical stimuli, etc. and is considered as a variant of the normal healing process of the peritoneum. In some cases, the formation of





adhesions can be beneficial for the patient, when the adhesions cover the area of infection and prevent the development of peritonitis. But it is impossible to predict when adhesions are beneficial and when adhesions are a problem. Therefore, the serious complications associated with adhesions make the reduction of their formation an important goal of modern surgical practice. Even with excellent surgical

technique, adhesions tend to re-form [2]. If the factor that caused the formation of adhesions is quickly eliminated, then fresh fibrous adhesions, which have not yet undergone complete connective tissue organization, tend to dissolve. When the inflammatory process is prolonged or there is a constant irritant, then fibrous adhesions undergo a connective tissue organization, and they no longer able to lyse. The formed adhesions of the abdominal cavity can undergo a certain evolution, restructuring, but disappear, that is, they cannot dissolve. Physiotherapy allows you to soften the adhesive structures, make them thinner and more extensible, but cannot destroy them.

Adhesions are classified according to severity, extent, type, density, and vascularization. They can be single, multiple, friable, dense, filmy, flat, thin and stringy. There are several classifications of the adhesive process, but they differ slightly from each other. Since the formed adhesions cannot be eliminated without surgical intervention, the main attention of researchers is directed to prevention and reduction after

operational adhesion. To reduce the primary inflammatory process, inhibition of the blood coagulation system, stimulation of fibrinolysis, mechanical separation of surfaces covered with fibrin, suppression of fibroblast proliferation, various means and methods have been proposed.

I. Improving Surgical Technique:

1. reduction of the operation time;
2. careful handling of tissues, minimal use of surgical instruments (forceps, clamps) on tissues not intended for removal;
3. limited introduction of foreign materials into the operating field;
4. thorough hemostasis;
5. intraoperative irrigation to minimize serous desiccation;
6. prevention of intra-abdominal infection;
7. use of thin areactive suture materials;
8. Prevention of tissue ischemia and hypoxia.





II. Pharmacological interference.

1. fibrinolytic agents.

- Plasmin, streptokinase , urokinase , hyaluronidase , chymotrypsin, trypsin, pepsin, plasminogen activators .

2. anticoagulants.

- Heparin, citrates, oxalates.

3. anti-inflammatory drugs.

- Corticosteroids, non-steroidal anti-inflammatory drugs, antihistamines , progesterone, colchicine.

4. antibiotics.

- tetracycline, cephalosporins of widths.

III. Adhesive barriers.

The use of most of the traditional methods for the prevention of adhesions is controversial, since many have not withstood a rigorous clinical examination or have practical limitations due to the high frequency of side effects and complications with low anti- adhesion efficacy.

The absence of the only effective remedy in the prevention of adhesions and the complexity of the problem led to the creation in 1996 of the International Society for Adhesions, the main goal of which is to consolidate efforts in the fight against the postoperative adhesion process and its complications. Of the numerous proposed drugs, the attention of researchers was attracted by tissue plasminogen activator (tPA) which is a potent thrombolytic agent due to its strong specificity for fibrin. It has been tried to prevent adhesion formation , however, due to its extremely short half-life (approximately 5 minutes), it becomes necessary to prescribe its infusion at a high dose, and this increases the possibility of systemic bleeding [1-5]. Bed and Palmieri et al . It has been experimentally proven that good results can be obtained using recombinant tissue plasminogen activator (rtPA), but the high cost and potential systemic toxicity are limiting factors for its widespread use in the prevention of peritoneal adhesions.(3)

To date, a promising method for preventing the formation of postoperative adhesions is considered to be the use of barrier methods made from non-reactive , biodegradable materials.(9) Biocompatible, absorbable gel barriers are safe and effective. They are easy to apply and quickly adapt to damaged tissues without fixation. The use of barriers differs from other methods in that they do not themselves interfere with the healing process, but potentially separate opposing surfaces during healing. Barrier drugs are placed intraperitoneally during or at the





end of surgery. The available barriers are solid, semi-solid or liquid agents. Many barriers liquefy in the body over time. Currently, the following barrier products are in circulation:

- Interceed™ (Johnson & Johnson / Ethicon corporation) - regenerated cellulose oxide. Intersid in the form of a knitted fabric with small porosity, does not require hemming to damaged tissues. It turns into a gel after about 8 hours. The material is usually absorbed within 4 days, if placed in several layers or in bundles, absorption

occurs within 4 weeks. Intersid must completely close the injured area, while careful hemostasis and removal of the lavage fluid is required, otherwise the effectiveness is lost. It is currently only approved for use in gynecological surgical procedures.(10-13)

- Fibrin glue - a combination of highly concentrated fibrinogen, thrombin, calcium and factor VIII. Fibrin glue separates exposed surfaces due to its sealing effect. However, the use of human blood for the production of glue limits its attractiveness as a surgical remedy.

- Seprafilm™ (Gemzyme corporation) - modified hyaluronic acid and carboxymethyl cellulose. It is a bioresorbable, transparent, flexible membrane barrier that is applied to potentially adherent tissue during surgery prior to abdominal closure. It adheres well to damp tissues, so complete hemostasis is not necessary. Seprafilm gels approximately 24-48 hours after placement, dissolves within 28 days and does not require re-operation to remove. Bed and . The W. Hellebrekers et al. studying the effectiveness of 5 different barriers, we came to the conclusion that Seprafilm can be used as a control standard.

- Preclude™ (W. Gore corporation) is made from Gore-Tex™ - polytetrafluoroethylene. It does not liquefy and needs to be removed by re-operation. Goreteks According C. Farquhar et al. surpasses intersid in preventing the formation of adhesions, but its usefulness is limited by the need for suturing and further removal of the membrane.

- Flo-Gel (Alliance Pharmaceutical corporation) - a gel, mainly consisting of Poloxamer 407, at temperatures below body temperature is in the form of a liquid, at body temperature it turns into a gel.

- Hyskon™ (Medison Pharmaceuticals corporation) - 32% dextran-70 solution, a water-soluble glucose polymer. It is absorbed from 5 to 7 days.

- Adcon P™ (Gliatech) is a gel that is absorbed into the body within 4 weeks.





- Repel™ and Resolve™ (Life Medical Sciences company) - bioresorbable polymer film and viscous gel.(12)
- Intergel™ (Life Core Biomedical corporation) - a combination of iron and hyaluronic acid. It is used only for gynecological operations, like intersid • Incert™ (Anika Therapeutick Inc Woburn MA) is a hyaluronic acid derivative.
- Seprocoat™ (Hal - C Grenzylme corporation) - solution, applied after opening the abdominal cavity, during the operation, irrigation every 30 minutes.
- Oxiplex™ (FzioMed) - an oxide of polyethylene and carboxymethyl cellulose in the form of a film. It can be used for laparoscopy through a 5 mm trocar. The film is easily applied to fabrics.
- Adhibit™ (Angiotech Pharmaceuticals) - c amopolimiziruyuschiysya liquid sprayed hydrogel uniquely suitable for endoscopic applications. Metabolized by the body in less than 30 days. It is used in gynecological practice for laparoscopic operations.
- Adept™ (Shire Pharmaceuticals Ltd) is a non - viscous solution of 4% Icodextrin, a new polymer of glucose solution, used during and after intervention for irrigation and infusion in laparoscopic and laparotomic operations. (11) Non-viscous liquid does not impair visibility during operation. Effective consumption within 500 ml for irrigation and 1000 ml for infusions. The adept offers significant advantages over competing agents. The existing barriers are not a panacea; the search for new ones continues. The K. H. Treutner et al. propose to target scientific efforts to single-dose intraperitoneal fluids that will significantly reduce postoperative adhesions in a reasonable cost without adverse effects on the blood coagulation system and wound healing. The ideal antiadhesion agent should be safe, effective, easy to use, and able to reduce the formation of abdominal adhesions. Today the adept meets these requirements to a greater extent. In order to prevent adhesions in gynecology, we used intraoperative ultrasound sanitation with dimephosphon solution in 61 patients during gynecological operations.(14) It was taken into account that under the influence of low-frequency ultrasound, structural changes occur in the abdominal cavity, primarily concerning mesothelial cells, neutrophilic polymorphonuclear leukocytes in the thickness of the peritoneum and exudate, where the formation of adhesions occurs. And dimephosphon has an antiseptic, anti-inflammatory, antiallergic, wound-healing effect and a barrier-protective function that enhances the effect of ultrasound.



During the early control laparoscopy (second look), it was found that the adhesions were more delicate, thinner and were not soldered to the operating area where the ultrasound effect was performed. (6) "Soldering" occurred only to the parietal peritoneum of the omentum, intestine, and these adhesions were easily subjected to adhesiolysis. At the first dynamic laparoscopy, adhesiolysis allowed to reduce the adhesive process to 71.26%, which was diagnosed during repeated dynamic laparoscopy. The further fate of adhesions, apparently, depends on the duration of the inflammatory process and the activity of the fibrinolytic system, which can be traced by performing dynamic laparoscopy for more later dates.

The method of prevention of postoperative adhesions depends on the parity of the operation, the presence of a concomitant inflammatory process, extragenital foci of infection, the urgency of the surgical intervention, the cost and availability of the method, as well as the level of the obstetric facility.

In our opinion, the most rational is the use of barrier methods. In the absence of the possibility of their application, complex methods of prevention are available, sufficiently effective and can be applied in any obstetric institutions, including emergency surgery. This is evidenced by our results.

The search for more effective components and agents at the level of molecular biology of cells continues. Newer technologies should lead to clinically relevant reductions in adhesion formation and provide a more definitive answer to this difficult problem.

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