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# REHABILITATION OF WOMEN WHO UNDERWENT CESAREAN SECTION AND ORGAN-PRESERVATION SURGERY AFTER DIVERGENCE OF SUTURES ON THE UTERUS

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## ANNOTATION

30 women were examined and treated in the postpartum period with a diagnosis of metroendometritis, divergence of sutures on the uterus after cesarean section. All were diagnosed by ultrasound and endoscopy (hysteroscopy and laparoscopy). Organ-preservation technology for postpartum endometritis and peritonitis in the main group was effective in 85 percent of maternity patients. Within 2 years, menstrual function was restored in 100% of women, pregnancy occurred in 50.0%.

**Keywords:** cesarean section, purulent-septic diseases, organ-preservation technology, rehabilitation

Among the most serious complications of cesarean section, accompanied by high maternal mortality, are metroendometritis and obstetric peritonitis. [1,5,7,9] These complications on the background of antibacterial and intensive therapy are associated with certain difficulties of timely diagnosis.

Based on the results of the III confidential analysis of maternal mortality cases (CAMMC) for 2016-2017 "In the name of saving the lives of mothers", the cause of MS from sepsis was 14.7%, and according to various authors, the incidence of purulent-septic complications of the prenatal period varies from 1-54.38%.

Sepsis is currently defined as "life-threatening organ dysfunction due to dysregulation of the host's response to infection." A key element of sepsis-induced organ dysfunction is an acute change in the SOFA scale – more than 2 points due to infection, which reflects an overall mortality rate of about 10-14%.

According to national standards and developed protocols for the management of women with septic complications, in the case of postpartum sepsis, obstetric peritonitis, the uterus should be extirpated – the removal of the focus of infection, which further affects the quality of life, family problems, psycho-emotional status, especially in first-time women.

As can be seen from our practice, there are primiparous patients whose childbirth ended in stillbirth (62.5%) and was complicated by sepsis, obstetric peritonitis, the source of which was the uterus. In this connection, we have been using organ-preserving tactics for the management of postpartum septic complications in the conditions of the Republican Perinatal Center (RPC) since 2016, thereby giving young women a chance for the subsequent preservation of reproductive function.

However, it is necessary to resort to the preservation of the reproductive organ only in cases when the reserve forces of the woman's body allow to preserve the uterus, for which we are developing an algorithm and criteria for the management of such patients, which is confirmed by the morphological picture, immunological studies, methods of functional diagnostics [11,13,14].

In the vast majority of cases, the cause of obstetric peritonitis, as well as predictors of puerperal metroendometritis, are failure of the suture on the uterus, hematomas of various localization, pelvic-head disproportion, acute appendicitis, chorionamnionitis, antenatal fetal death, Cuveler's uterus, numerous vaginal examinations and interventions with aseptic disorders, according to the data of the 2nd CAMMC report for 2013-2015 [4,10,12].

Timely surgical intervention is crucial in the treatment of these complications [5]. Until recently, the traditional tactics of treating such patients included the removal of the uterus [2,8], which led to a complete loss of reproductive function and disability of young women, which translates this problem from the medical sphere to the social sphere.

Improving the methods of treating infectious complications, extracorporeal detoxification including methods, the emergence of a new generation of antibiotics, the introduction of endovisual surgery (hystero and laparoscopy) into obstetric practice, allow us to revise the "traditional" tactics of treating patients with obstetric peritonitis and perform innovative reconstructive – organ-sparing operations, allowing us to avoid traditional radical surgery – total pangisterectomy, bilateral salpingectomy with drainage of the vaginal stump, according to national protocols and standards [7,15].

Starting from 2017 to 2021, the RPC uses the tactics of organ-preservation remodeling operations using the following methods: revision of the abdominal cavity and pelvis, necrectomy of an incompetent suture on the uterus, metroplasty, myometriography, imposition of double-row nodular secondary sutures on the uterus, sanitation and drainage of the abdominal cavity and pelvis [3].

In our center, the technology of these operations has been developed and tested in detail, but the issues of rehabilitation, early postoperative recovery period, normalization of menstrual and fertile function, as well as long-term results and complications have remained unexplored.

In connection with the above, we set a goal: to evaluate the results of the ongoing therapeutic, preventive and rehabilitative measures in women who underwent organ-preservation surgery for postpartum purulent-septic complications after cesarean section.

## I. MATERIALS AND METHODS

The main group consisted of 31 women after cesarean section, who were diagnosed with a divergence of sutures on the uterus and performed an organ-preserving operation; the comparison group was 20 women who underwent a cesarean section, with an uncomplicated course of the postoperative period.

The number of stillbirths is 16 (51.6%) and live births are 15 (48.3%) newborns in maternity hospitals who underwent organ-preserving operations after CS. Moreover, the number of stillbirths in pre-pregnant women from all cases of stillbirth is 16 (62.5%).

The scope of the study included clinical, biochemical, microbiological, hemostasiological studies, ultrasound Dopplerometry, pelvic organ elastography. Hysteroscopy and laparoscopy were performed using KarlStorz equipment. The methods were used for early detection of the failure of sutures on the uterus, timely excision of the wound with the restoration of the integrity of the uterine wall. The excised tissues of the postoperative wound were subjected to morphological examination.

During hysteroscopy, synechiae were dissected using a hysteroresectoscope, blood clots and altered endometrium, detritus were removed. The integrity of the wound was determined after cesarean section. There was a defect in the area of the surgical scar with or without penetration into the abdominal cavity, a perforated hole in the uterus is a symptom of a "niche", sagging threads with the failure of the scar on the uterus. Necrotic masses, areas of placental tissue were removed, followed by endometrial ablation, etc. If a defect is detected, extend the indications to laparoscopy or laparotomy.

During laparoscopy, the pneumoperitoneum was created with the help of carbon dioxide, after the introduction of a laparoscope and trocars, an abdominal cavity was reviewed, the condition of the peritoneum, the presence and nature of effusion, hematomas, the consistency of sutures on the uterus were clarified. When a wound defect was detected and purulent spilled peritonitis was excluded, they switched to expanding the scope of the intervention and performed a relaparotomy.

During the revision of the abdominal cavity and examination of the uterus, there was purulent-inflammatory infiltration of tissues along the sutures with the presence of through defects of different sizes, panmetritis, necrosis, divergence on the anterior wall of the uterus of sutures from the CS operation. Dissection of adhesions, rehabilitation in the area of the postoperative suture on the uterus (removal of cut ligatures, emptying of hematomas) was performed. Instrumental emptying of the uterus-curettage, drainage of abscesses, local necrectomy at the edges of the wound: excision of the edges of the wound on the uterus to healthy tissue (up to 2-3 cm), the imposition of a secondary, separate, double-row nodular suture on the wound with an absorbable synthetic thread vicril with a/bacterial impregnation No. 2 or 1. In some complex cases, in the presence of areas of deserialized intestines, intestinal obstruction, acute appendicitis, intestinal decompression of the intestines was performed using long Abbott-Miller-type small intestine probes, adequate drainage, sanitation and drainage of the abdominal cavity.

## II. RESULTS AND DISCUSSION

There were 50.0% of first-borns (15), and 50.0% of second-borns (15). The age of the examined patients ranged from 21 to 35 years ( $26.9 \pm 0.9$  years). Indications for cesarean section surgery were pelvic-head disproportion – 40.0% (14), incompetent scar on the uterus – 26.7% (8), severe preeclampsia – 20.0% (6), prenatal bleeding – 10.0% (3), leg presentation – 3.3% (1). The analysis of the terms of admission of maternity hospitals to the RPC showed that after abdominal delivery, patients were admitted for 7-15 days, on average for  $13.5 \pm 0.7$  days. The late admission of postpartum patients after CS can be explained by the fact that most often the general weakness and malaise of the maternity hospital was associated with the operation, and the pain syndrome was associated with the presence of a wound on the abdomen.

For the early diagnosis of sepsis, the SOFA bedside scale is designed, which is used before the patient is admitted to the intensive care unit (ICU) (emergency room, specialized departments). The SOFA bedside scale evaluates 3 indicators:

- Glasgow Scale (mental status disorder),
- Systolic blood pressure  $\leq 100$  mmHg,
- BH  $\geq 22$  v min.

The presence of at least two of these criteria strongly predicts the probability of an unfavorable outcome. In the conditions of the ICU, the standard SOFA scale is used (Society of Critical Care Medicine European Society of Intensive Care Medicine, 2016). The basic SOFA count is zero if there were no organ function disorders before. SOFA  $\geq 2$  points indicates the presence of organ dysfunction, the total mortality is approximately 10-14%. An increase in the SOFA score in the dynamics of observation for every 2 points, increases the mortality rate for every 10%.

The smallest value of the SOFA index is 0; The largest value of the SOFA index is 24; According to our results, in 16 patients, the results on the SOFA scale ranged from 6-12 points, and in 15 - from 13 to 20 points, but only in 1 patient in 2016. A relaparotomy was performed, followed by extirpation after secondary sutures were applied, and its score on the SOFA scale was 23 points.

During the ultrasound examination (medical ultrasound), the state of the endometrium and myometrium, the scar on the uterus after cesarean section were evaluated, signs of an inflammatory process, pathological inclusions in the uterine cavity, the presence of an effusion in the abdominal cavity were revealed. The most common echographic markers of endometritis after cesarean section were: a decrease in the rate of uterine involution and pathological expansion of the uterine cavity that does not correspond to the terms of the postoperative period; edema and the presence of infiltration in the area of postoperative sutures on the uterus; hematomas (often small) under the vesicular fold. In women with endometritis, the myometrium was involved in the inflammatory process in the suture area during subinvolution of the uterus, there is an expansion of the uterine cavity and accumulation of heterogeneous structures in it (old clots, pus, detritus), the presence of hyperechoic deposits on the walls, hematopyometer is characteristic. In the Douglas space, there are old hematomas, subcutaneous suppurated seromas in the form of fine hyper - and anechoic inclusions. Anatomical inconsistency was expressed in the formation of a defect in the wall and fistula passages from the side of the uterine cavity in the form of an irregular triangular "niche" and pronounced thinning of its distal part by hyperechoic edges, as well as the formation of abscesses at the sutures and in the pelvis. It is possible to visualize formations in the abdominal cavity: a foreign body-gives an acoustic shadow, fibrin threads with peritonitis, with appendicitis, an accumulation of dispersed fluid

with a suspension in the right iliac region, subhepatic and inter-loop abscesses in a dense hyperechogenic capsule, a symptom of a "pendulum" with intestinal obstruction, adhesions, swelling and infiltration of the omentum, conglomerates, foreign bodies, etc.

During the Dopplerometry study, signs of inflammation of the muscular layer of the uterus were noted in the form of an increase in the vascular pattern: the appearance of sharply dilated vessels, the presence of structures with reduced echo density in the projection of the suture after cesarean section. The indices of vascular resistance indices in maternity hospitals with suture failure were significantly lower than in maternity hospitals with a normal course of puerperium. During laparoscopy, the diagnosis of incompetence of sutures on the uterus after CS was confirmed in all maternity patients, they performed a programmed relaparotomy, during which a new approach was implemented – the use of organ-preserving surgery for incompetence of sutures on the uterus. During relaparotomy, patients of the main group had a pronounced infiltration in the area of surgery and a divergence of sutures on the uterus from 3 to 6 cm, in 15 cases there was a complete divergence throughout the wound.

Our recommendations, according to the protocols and national standards for the management of women with obstetric peritonitis and postpartum septic complications, included:

- to evaluate the effectiveness of complex therapy based on the following parameters;
- stabilization of the patient's condition and, as a result, reduction of intoxication;
- persistent regression of signs of sepsis (tachycardia, tachypnea, decreased body temperature and improved blood parameters), according to the SOFA scale;
- improvement of the function of vital organs;
- positive dynamics of the functional state of the gastrointestinal tract, the fight against intestinal paresis (restoration of motor skills, natural nutrition, eubiotics);
- normalization of laboratory parameters.

In the postoperative period, the principle of "early intensive multi-stage targeted therapy" was carried out: oxygenation and respiratory support, prevention of pulmonary embolism (PE) with low-molecular-weight heparins, as well as purulent-septic complications. Antibacterial therapy was intensified in combinations of three antibiotics, according to prescribing national protocols (Meropenem 1.0 g x 3 times a day, Moksikum 400 mg x 1 time a day, Amicacini 500 mg x 2 times a day. Or 2 combination options: Perota 2 gr x 2 times a day, Levomak 100 mg x 2 times a day, Metrolin 100 mg x 3 times a day, and two days later, in case of inefficiency, switch to Clindamycin 900 mg x 3 times a day. The administration of broad-spectrum antibiotics was prescribed for a course of 7-10 days only intravenously, and fluoroquinolones for 5 days. Post-syndrome therapy continued, infusion therapy, active management of the postoperative period, early activation, and bandaging of the lower extremities were carried out under the control of central venous pressure (CVD) and diuresis. With the help of the above-mentioned methods of "early intensive therapy of sepsis", detoxification, rheological correction and immunocorrection of the reserve forces of a weakened organism are achieved. Due to the combined action of all these mechanisms, extracorporeal elimination of toxic substances, antigens, protein breakdown products, cytokines is performed; blood viscosity decreases, microcirculation improves, altered tissue metabolism normalizes, and tissue oxygenation occurs.

Symptomatic therapy: oral hydration – more than 2-3 liters. Uterotonics: oxytocin on the second day after surgery, 0.5 ml-2.5 units of oxytocin.

In the case of intestinal paresis, it is necessary to take measures to combat detoxification of the decomposition products of toxins and metabolic acidosis: the installation of a nasogastric probe, siphon enemas, potassium preparations under the control of acid-base state of arterial blood, metolclpromide, adequate long-term peridural anesthesia, antispasmodics, shock doses of eubiotics and semiticone. Nonsteroidal anti-inflammatory drugs (NSAIDs) – diclofenac, ketoprofen.

It is advisable to use humoral immunity factors-antistaphylococcalgammaglobulin 3 doses, Octagam, Pentogloblin, anti-cytokines (Galavit). Fresh frozen plasma (FFP), red blood cell mass, albumin according to indications.

If the dynamics are positive, continue therapy, daily lavage of the uterus with the installation of antiseptics and treatment of the cervix with erythromycin ointment, pricking the cervix with antibiotics. It is recommended to use fluconazole 150 mg intravenously once every 7 days of ongoing treatment with antibacterial drugs, antihistamines for the prevention of candidiasis and dysbiosis [22, 28-30].

Rehabilitation of a postoperative wound. When the seams on the skin diverge, the traditional treatment is performed and additionally with a solution of Forgals, and then after cleaning the wound, laying ointments with Levomekol with Oflomelid for two days.

Prevention of stress ulcers of the stomach should be carried out in all patients with severe sepsis/septic shock H2 receptor inhibitors (kvamatel) are more effective.

After achieving, because of successful intensive care measures, a stable condition of the patient, the blood glucose level should be maintained in the range of 4.4 - 8.3 mmol/l.

Patients were discharged with an individual account of the general condition on the 10-14 day after relaparotomy.

During rehabilitation measures, decompensation of chronic somatic pathology has a significant impact on the outcome, with the most common cases being pyelonephritis (46.7%), diseases of the gastrointestinal tract (23.3%) lung (16.7%) CVD (13.3%). A special place is occupied by chronic and post-hemorrhagic anemia, as a rule, the frequency of which in our studies was 100%. Treatment and correction of somatic diseases occupy an important place in the positive outcome of organ-preserving operations.

The histological conclusion of the surgical material fit into the picture of acute necrotic detritus in the lower segment of the uterus, ischemia with purulent-inflammatory melting. In the early stages (3-7 days), inflammatory and destructive changes in the endomyometry prevailed: purulent inflammatory infiltration of the myometrium, melting of muscle fibers with necrosis, hemorrhage. In the following periods (8-15 days), reparative processes and tissue remodeling in the myometrium, resorption of hemorrhages, necrotic detritus, proliferation of cellular-fibrous tissue against the background of inflammation were observed. After excision of necrotic-inflammatory tissues in the uterus and the application of secondary sutures, wound healing was monitored using ultrasound and Doppler studies.

20.0% (6) were discharged in a satisfactory condition for outpatient observation on the 5th - 7th day, 26.7% (8) on the 10th-16th day, 53.3% (16) of maternity hospitals on the 20th-40th day.

After discharge from the hospital, the patients were monitored for 1 year in the Catamnesis room in the RPC and at the place of residence.

The rehabilitation measures developed by the doctors included:

- Ultrasound monitoring of uterine involution after discharge for 1 month.
- Rehabilitation of the postoperative wound with a solution of 3% peroxide, Forgals, if there is a discrepancy of sutures on the skin, then the wound was sanitized as much as possible, the edges of the wound were cleaned, and then levomicol and oflameid ointments were laid for two days until the wound on the skin was completely healed.
- Lavage of the uterus – instillation with an antiseptic solution, treatment of the cervical canal with erythromycin ointment, administration of antibiotics into the cervix. Antimicrobial candles and candles with estrogens.
- Taking direct-acting anticoagulants-low-molecular-weight heparins for 2 weeks after surgery, then aspirin at a dosage of 150 mg for 2 months-as a prevention of PE and postpartum thrombophlebitis under the control of blood clotting system indicators
- Immunotherapy humoral immunity factors were used-immunoglobulins - antistaphylococcal gammaglobulin 3-5 doses after surgery, octagam, pentoglobin, anti-cytokines (Galavit). FFP, red blood cell mass, albumin – according to indications.
- Antifungal therapy
- Eubiotics for 1-2 months, to restore the intestinal microbiota. Probiotic candles are placed in the vagina to restore the balance of the vaginal microflora.
- After 5 days - candles with estrogens in the vagina – the course is 18-20 days.
- 2 months after the operation, Femoston 2/10 for 9-12 months, for the restoration of endomyometrial uterodomes, elimination of hormonal dysfunction, as well as restoration of reproductive function.
- Physiotherapy – for the prevention of the adhesive process after 1-2 months.



- Absorbing therapy (candles: Longidase 50mg, Distreptase) has a prolonged-acting hyaluronidase (enzymatic, proteolytic) activity, chelating, antioxidant, immunomodulating and moderately pronounced anti-inflammatory properties, anti-fibrotic properties, weakens the course of the acute phase of inflammation, increases the humoral immune response and the body's resistance to infection. Proteolytic serratopeptidases.
- Microclysms with sodium thiosulfate into the rectum.
- Spa treatment after 6 months.
- After Femostone - contraception with combined oral contraceptives (COC) for 6-9 months.

Ultrasound determined the thickness of the scar on the anterior wall of the uterus, the absence of defects, hematomas, Dopplerometry allowed to determine the state of blood flow, improvement of vascularization and restoration of the architectonics of the vessels in the myometrium and around the postoperative scar.

Of the 31 operated women in the main group, menstruation was restored after 1 month in 2 (6.4%), after 3 months-in 4 (12.9%), after 5-6 months – in 21 (67.7%), after 8-10 months - in 3 (9.6 %) and after 12 months-in 1 (3.2 %).

The timing of recovery of menstrual function in the women of the comparison group did not differ from the data of the main group. Pregnancy occurred in 15 (50.0%) women, of which 6 (20.0%) were diagnosed with an undeveloped pregnancy at the age of 6-8 weeks and a medical abortion was performed. In 8 (26.7%) women, pregnancy progresses at the time of 18-30 weeks against the background of taking Utrogestan 200 mg 2 times a day vaginally, and 1 (3.2 %) patient at the gestation period of 36 weeks had an emergency delivery by cesarean section, a live full-term newborn weighing 3000g with a length of 49 cm was extracted on the Apgar scale of 7-8 points.

During the follow-up period, complications occurred in 2 (6.7%) women. One had the formation of synechiae in the area of the internal pharynx, a hematoma 3 months after metroplasty – she underwent hysteroscopy, dissection of the synechiae and restoration of the uterine cavity. Another patient had a hematoma in the area of the wound on the uterus, the phenomena of septic shock, the score on the SOFA scale was 23 points, in connection with which a re-laparotomy and hysterectomy with salpingectomy and drainage of the vaginal stump were performed in 2016.

### III. CONCLUSIONS

The introduction of innovative technology in obstetric practice –the preservation of the uterus in the conditions of divergence of sutures on the uterus after cesarean section and serous / limited peritonitis, is an effective method in the conditions of a level 3 maternity hospital. The decisive moment in the fate of a woman is the rehabilitation of her health and reproductive function after relaparotomy and metroplasty. The algorithm developed by us for managing the patient for 2 years was effective in 85% of maternity patients, menstrual function was restored in 100% of women, pregnancy occurred in 50.0%, complications amounted to 15%, of which the organ was removed in 3.3% of cases.

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