
Histological Analysis of the State of the Scar After Operational Delivery

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Relevance: According to world scientists, the frequency of Caesarean section is 18.1%. Expansion of indications for CS is justified if it leads to a reduction in perinatal morbidity and mortality. It is known from the literature that CS surgery at a frequency of 8-10% of all births really leads to a decrease in perinatal mortality, but there is a study that shows that an increase in the frequency of abdominal delivery above 15-17% increases the likelihood of postoperative complications with unchanged perinatal mortality. The management of patients with a uterine scar requires a deeper study of this issue in order to develop optimal methods of delivery.

Purpose – Определить уровень коллагена IV типа (отвечающую за репарацию тканей) у пациентов с рубцом на матке.

Material and methods: The study was conducted in the obstetric department of the clinic No. 1 of the Samarkand Medical University. The work is based on the analysis of the results of a comprehensive examination of 103 patients of reproductive age with one scar on the uterus, which were divided into 2 groups and 4 subgroups in the period from 2018-2020. As a new method of study, the level of type IV collagen was determined in patients.

Results: To achieve this goal, prognostic significant clinical, anamnestic, instrumental criteria for assessing the state of the scar on the uterus were determined. The sera of all patients, regardless of the method of delivery, were studied by the enzyme immunoassay method. Limits of normal indicators; the level of antibodies, defined as $M \pm 2$, was for antibodies to Collagen I from 0.012 to 0.059. When analyzing the results, no significant relationships were found between the level of antibodies, age and gender ($p > 0.1$).

The average level of antibodies to type I collagen in group 1 was 0.145 ± 0.012 , which is significant for healthy individuals ($p < 0.001$ anti-Col I). An elevated level of anti-Col I was detected in 25 patients (26%).

Conclusion: For delivery through the natural birth canal of pregnant women with a uterine scar, the thickness of the uterine wall in the area of the scar, according to Doppler data, is from 3 mm to 7 mm and the level of antibodies to type I collagen is at least 349.55 $\mu\text{IU} / \text{ml}$.

Key words: uterine scar, caesarean section, operative delivery, histology, atrophy, replacement by connective tissue.

Relevance. According to world scientists, the frequency of cesarean section is 18.1%, and the highest frequency (100%) was observed in pregnant women with an abnormal position of the fetus (including a history of CS), as well as during the first birth in the breech presentation of the fetus (92.3%) [2,8,11,20]. This confirms the fact that the tactics of delivery in breech presentation also changed in the direction of the COP (60-80%). Expansion of indications for CS is justified if it leads to a reduction in perinatal morbidity and mortality. It is known from

the literature that CS surgery at a frequency of 8-10% of all births really leads to a decrease in perinatal mortality, but there is a study that shows that an increase in the frequency of abdominal delivery above 15-17% increases the likelihood of postoperative complications with unchanged perinatal mortality [1,3,7,15].

Childbirth is the final stage of pregnancy, and the condition of the mother and the newborn child depends on the correctness of their management, and therefore new high-tech research methods are being developed for more effective management of pregnancy and childbirth. In a situation where the frequency of abdominal delivery is high, it naturally becomes necessary to analyze the indications for this operation. For many years, part of the generally accepted indications and those that require emergency intervention, as a rule, correspond to classical obstetrics, remains unchanged, but some appear again due to the introduction of new technologies into obstetric practice [4,6,9,12].

The degree of usefulness of healing of the dissected wall of the uterus is the main problem of the next pregnancy. The authors note that for a correct understanding of the course of pregnancy in the presence of a scar on the uterus and the choice of the correct tactics for managing pregnancy and childbirth, it is necessary to have a clear idea of the process of formation of a scar on the uterus after surgery [13,19,22]. The authors note that in the clinical aspect, the term "uterine scar" refers to a situation that occurs after an incision in the uterus, regardless of the nature of the healing of the dissected wall, that is, indicates the fact of dissection of the uterus during surgery.

The management of patients with a uterine scar requires a deeper study of this issue in order to develop optimal methods of delivery.

Purpose of work – Determine the level of type IV collagen (responsible for tissue repair) in patients with a uterine scar.

Material and methods. The study was conducted in the obstetric department of the clinic No. 1 of the Samarkand Medical University. The work is based on the analysis of the results of a comprehensive examination of 103 patients with one scar on the uterus. The patients were divided into 2 groups: the 1st group of 63 patients admitted in a planned manner, and the second group of 40 patients admitted in the first stage of labor on an emergency basis. At the first stage of the study, an analysis was made of the frequency of caesarean section, the frequency of repeated operations in patients with a scar on the uterus, as the main indication for surgery; structure of intra- and postoperative complications. At the second stage, a study was made of the features of the anamnesis and data of ultrasound diagnostics in women in labor with a scar on the uterus in order to identify risk factors for the formation of an inferior scar.

At the third stage, there was a prognosis of childbirth through the natural birth canal in pregnant women with a scar on the uterus based on measuring the thickness of the uterine wall in the area of the scar, dopplerometry of the lower uterine segment, determining the level of antibodies to type I collagen in venous blood plasma, assessing the "maturity" of the birth canal on a scale Bishop. Morphological study of the scar on the uterus after repeated CS.

From general clinical studies, the following methods were carried out: Complete blood count, general urinalysis, flora smear, and laboratory methods of research included an assessment of the state of hemostasis, determination of the level of Collagen type IV, and a biochemical blood test. Instrumental methods were used ultrasound Doppler scanning.

In this article, we would like to dwell in more detail on the results of the analysis of the level of antibodies to type I collagen in venous blood plasma, which are responsible for tissue repair. All data were processed using Microsoft Excel, Statistica 6.0 and SPSS 16.0 programs in accordance with modern requirements for the analysis of medical data.

Results: We analyzed 2401 birth histories of women who gave birth operatively in the period from January 2016 to December 2018. All patients underwent a caesarean section in the lower uterine segment with a transverse incision. The mean age of the patients was 27 ± 0.7 years.

Most of the women studied were multiparous - 1407 (58.6%). At the same time, there is a significant proportion of primiparous patients - 994 (41.4%).

To achieve this goal, prognostic significant clinical, anamnestic, instrumental criteria for assessing the state of the scar on the uterus were determined. The work is based on the analysis of the results of a comprehensive examination of 103 patients of reproductive age with one scar on the uterus, which were divided into 2 groups and 4 subgroups in the period from 2018-2020. The patients of the studied prospective groups were comparable in age, which ranged from 18 to 35 years, the average age was 24.5 ± 4.1 years.

Indications for delivery by caesarean section during a previous pregnancy varied widely. It should be noted that most of the most common indications for caesarean section were directly related to this pregnancy and the course of labor and depended little on the somatic status of the pregnant woman, thus, not excluding the possibility of delivery through the natural birth canal in subsequent pregnancies.

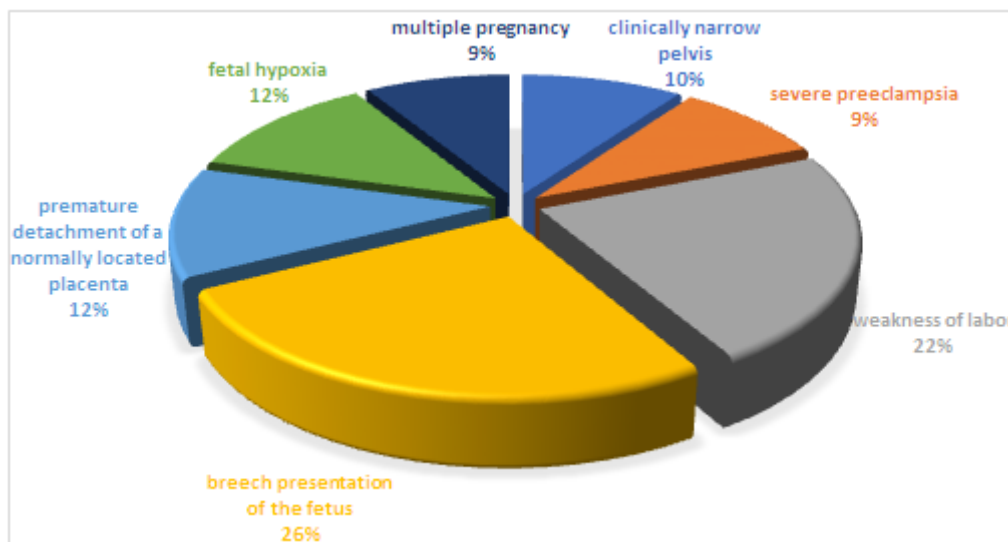


Figure 1 - The structure of indications for the previous operation caesarean section in group 1

If we consider the indications for operative delivery by groups, then in group 1 of women, the most common indication was breech presentation of the fetus - in 25.3% of patients, which is significantly more than in group 2, in second place - fetal hypoxia and premature detachment of a normally located placenta - in 11.6%, which is 4.2 times more often than in group 2 ($p=0.007$), in the third - a clinically narrow pelvis - in 9.6% of women. The structure of indications for surgery in the main group is shown in Figure 1.

Common reasons for surgery were weakness of labor activity - in 8.2% of patients and severe preeclampsia - in 8.9% of women, which is 6.4 times more often than in group 2 ($p=0.006$).

In both groups of examined women, mild anemia was the most common complication during pregnancy. The second most frequent complication is the threat of abortion, which is typical for the first and second trimesters. Among the frequent complications, toxicosis of the first half of pregnancy and low placentation can be distinguished, which were equally common in both groups.

Antibodies to collagen types I and II were determined by indirect enzyme-linked immunosorbent assay on polystyrene plates (ELISA test) according to the classical method described earlier in a number of literature sources with changes. The choice of ELISA as the main method used in our work is based on the facts that ELISA is convenient and relatively easy to perform, has high specificity and sensitivity. Plates (DYNATECH, Germany) were sensitized with ICN type I and II collagen (Cat. No. C-9879 and C-8886, respectively) dissolved in phosphate buffer pH 0.1 M pH 7.2 at a concentration of 20 µg/ml (15 µg/ml for type II collagen), 150 µl in each well. Incubated for 18 hours at 4°C. After washing from unbound antigen 4 times for 3 minutes with buffered saline (pH=7.2) with the addition of 0.05%

Tweena-20 was added to the wells with 150 µl of 2% bovine serum albumin in PBS to prevent non-specific binding of the protein to the polystyrene surface. After 1 hour of incubation at 37°C, the plates were washed again with PBS and 100 µl of the test sera diluted with 1% BSA to a concentration of 1:100 were added. After 1 hour of incubation at 37°C and washing 4 times for 3 minutes, affinity-purified antibodies against human immunoglobulins labeled with peroxidase at a working dilution of 1:1000 specified by the manufacturer (ICN, USA) were added to each plate. After incubation (1 hour at 37°C) and washing (4 times for 3 minutes), 100 µl of the substrate was added to the wells - a solution of orthophenylenediamine in phosphate-citrate buffer (pH = 4.9) with the addition of 0.02 ml of 3% hydrogen peroxide solution. The reaction was stopped after 30 minutes with 1N sulfuric acid. The results were recorded on a vertical beam spectrophotometer MULTISCAN-EX (Labsystems, Finland) equipped with a microprocessor at a wavelength of 490 nm.

The sera of all patients, regardless of the method of delivery, were studied by the enzyme immunoassay method. Limits of normal indicators; the level of antibodies, defined as $M \pm 2$, was for antibodies to Collagen I from 0.012 to 0.059. When analyzing the results, no significant relationships were found between the level of antibodies, age and gender ($p > 0.1$).

The average level of antibodies to type I collagen in group 1 was 0.145 ± 0.012 , which is significant for healthy individuals ($p < 0.001$ anti-Col I). An elevated level of anti-Col I was detected in 25 patients (26%).

The majority of pregnant women (76.2%) were delivered at a gestational age of up to 40 weeks, while among patients of the 2nd group, a caesarean section was most often performed up to 40 weeks - in 93% of patients ($p = 0.04$); at the same time, a fourth of the pregnant women were delivered at a term of more than 40 weeks ($p = 0.001$).

Conclusion. For delivery through the natural birth canal of pregnant women with a uterine scar, the thickness of the uterine wall in the area of the scar, according to Doppler data, is from 3 mm to 7 mm and the level of antibodies to type I collagen is at least 349.55 µIU / ml.

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