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CLINICAL COURSE PECULIARITIES OF PREGNANCY AND LABOUR IN WOMEN AFTER MYOMECTOMY, THEIR ASSOCIATION WITH SCAR MORPHOLOGY

Abstract. *The results of echographic examinations, echo Doppler metric evaluation of the uterine circulation and morphological uterine scar examinations of women after myomectomy obtained by means of an advanced methods have demonstrated a certain association available between improvement of the uterine hemodynamic condition and peculiarities of gestation clinical course, depending on the method to perform surgery, which enables to predict a clinical course of pregnancy for these women.*

Key words: *conservative myomectomy, pregnancy, echography, echo Doppler metricity, scar morphology.*

Introduction. Nowadays uterine myoma is one of the most widespread tumour in women of a reproductive age, which can have a negative effect on the development of pregnancy and labour [1, 2, 3]. The rate of this pathology has a tendency to increase, and it is estimated by various authors from 6 to 20% [4, 5].

Uterine scar available after myomectomy in pregnant women according to evidence presented by a number of authors [6, 7] determines new problem for obstetricians: evaluation of the myometrium functional state during pregnancy and examination of the fetal-placental complex condition depending on the localization of uterine scar and ensuring physiological hemodynamic changes in the process of pregnancy associated with the fetal functional state. In this respect the study of physiological mechanisms of uterine blood supply depending on the character, volume and methods of reconstructive-plastic surgery performed before pregnancy is of a considerable theoretical-practical interest. These issues are closely connected with morphological evaluation of the

myometrium state in the uterine scar area after conservative myomectomy in order to ensure physiological development of pregnancy and to choose an optimal method of delivery.

Objective: to find interdependence between peculiarities of pregnancy clinical course and labour in women with uterine scar after conservative myomectomy and myometrium morphology in the area of surgery performed depending on the character of surgery.

Materials and methods. Clinical course peculiarities of pregnancy and labour of 126 women, who underwent conservative myomectomy before pregnancy, are investigated. The patients were distributed into two groups depending on the methods of surgery performed:

1 group – 59 women after conservative myomectomy performed according to the present methods of surgery;

2 group – 67 women after conservative myomectomy performed according to the advanced methods of surgery.

30 women, who were first-time mothers, without somatic and gynecological pathology

constituted the control group.

Women of the 2nd group during conservative myomectomy underwent removal of one or several nodes with simultaneous suturing of the bed by means of uninterrupted ascending circumferential suture preventing against formation of microhaematomas and enabling to restore anatomical position of the uterine oblique muscles (Patent for invention «The method to perform myomectomy during cesarean section» O.O. Zelinsky, O.V. Zhovtenko. МПК (2014.01): A61B1 17/00. Registration number of application – 2013 13842.)

The package of investigations included clinical, instrumental, functional, laboratory and morphological examinations.

Echography examination was conducted on the device Toshiba Xario SSA-660A (Japan) transabdominally (by means of a convective transducer with 3,5 MHz frequency). Fetometry and placentography were conducted during examination, and amount of amniotic fluid was evaluated. To evaluate blood circulation the method of coloured Doppler mapping was applied, resistance index and systolic-diastolic ratio in the uterine arteries and vessels of the fetal-placental complex were measured [8].

Small pieces of uterine scar tissue obtained from ten women of the second group after conservative myomectomy were examined according to the designed methods, and small pieces of biotrium in the cut uterine area were obtained from five women of the control group during cesarean section. The tissue was fixed in 10% neutral formalin solution followed by a standard processing of the material and preparing paraffin-embedded blocks. Block sections were stained with hematoxylin and eosin, collagen fibers were examined after van Gieson staining.

Results and discussion. In women who underwent conservative myomectomy before pregnancy (1 group) the rate of its complicated development was 64,4%, at the same time threat of miscarriage was observed in 44,1% of women; placental dysfunction – 30,5%; retardation of fetal development – 23,7%; premature labour – 10,2%. Delivery by means of cesarean section was 94,9%; repeated myomectomy was performed in 23,5%, the level of uterine sub-involution was in 10,2% and endometritis – 6,8% respectively.

Application of the advanced method of conservative myomectomy (2 group) enables to decrease the total rate of complicated pregnancy (from 64,4% to 32,8%) at the expense of a reduced threat of miscarriage (from 44,1% to 20,9%); placental dysfunction (from 30,5% to 17,9%); retardation of fetal development (from 23,7% to 8,9%); premature labour (from 10,2% to 3,0%), cesarean section (from 94,9% to 89,6%) and repeated myomectomy (from 23,5% to 17,1%).

Peculiarities of the blood circulation in the uterine arteries in women after conservative myomectomy are: gradual increase of the normal and decrease of highly resistant types of blood flow rate curves as far as pregnancy develops beginning from 12-16 weeks of gestation. After 17 weeks of gestation a part of normal curves of the blood flow per one uterine artery was 75,0%, at the same time the curves with zero value of the final diastolic blood flow were not registered.

Normal uterine blood flow in all the terms of gestation was more often registered in patients whose placenta was located behind the projection of a thin scar (scars) on the uterine after myomectomy. Dynamics of its changes till 32 weeks of gestation was similar in both examined groups (1 and 2): in the terms of 8-16 weeks of gestation normal blood flow was registered in less number of patients (13,5% - 10,2% and 37,3% - 34,3% respectively) and it increased considerably in the terms of 17-32 weeks of gestation (47,5% - 50,7% and 57,6% - 70,1% respectively), demonstrating the best indices of blood supply in pregnant women after myomectomy in this period. In the second half of the third trimester (since 33 weeks) in patients of the 2nd group the rate of normal uterine blood flow after being reduced to 63,3%-60,0% remained unchanged till the end of pregnancy. In patients from the 1st group a considerable reduction of normal uterine blood flow was detected (to 43,3%-33,3%), which is indicative of disorders of functional compensatory possibilities of the uterine-placental complex in this group of pregnant women.

During the period since 12-16 to 25-32 weeks a gradual reduction of rate of I degree blood flow disorders is found. Beginning from 33 weeks of gestation a gradual increase of blood flow disorders in the 2nd group was observed (to 40,0-

36,7%), and in the 1st group this increase was rather pronounced (to 50-47,6%), remaining on this level till the term of delivery. The latter can be indicative of less ability to compensatory-pressure changes in the uterine-placental complex during late terms of gestation in patients from the 1st group.

Disorders of uterine circulation of II degree in the 1st group was registered in all the terms of gestation, and till the end of pregnancy their number decreased to 10,2%. Among pregnant women from the 2nd group II degree of blood circulation disorders was registered only till 16 week of gestation in 10 women (14,9%). The data obtained can be indicative of the fact that the uterine-placental complex has considerable potential abilities to compensate haemodynamic disorders.

III degree of uterine circulation disorders was registered only in the terms of 8-11 weeks in 10,2% of patients from the 1st group with a pronounced threat of miscarriage which is indicative of the fact that III degree of blood circulation disorders is practically incompatible with further progress of gestation processes.

Therefore, the areas of placenta with insufficient maternal blood supply decreases reserve abilities of the placenta considerably as well as its adaptive ability to changes, which can be found in case of reliable association of acute disorder of the maternal or fetal circulation, and result in the development of fetal distress. The results obtained do not contradict the literary scientific data available [9].

Collagen fibers are found in scar tissue with preserved bundle structure. Separate collagen fibers have focal hyaline degeneration (Fig. 1). The vessels of the venous and arterial types are found in the connective tissue (Fig. 2).

The central part of the scar contains considerably less vessels as compared to the peripheral part. Muscle fibers are found among the bundles of collagen fibers, in some places the scar is completely substituted by the muscle fibers.

On the border of the scar connective tissue and uterine masculine tissue muscle fibers in some places are chaotically directed and twisted with collagen fibers of the connective tissue (Fig. 3). Cellular elements of the connective tissue are

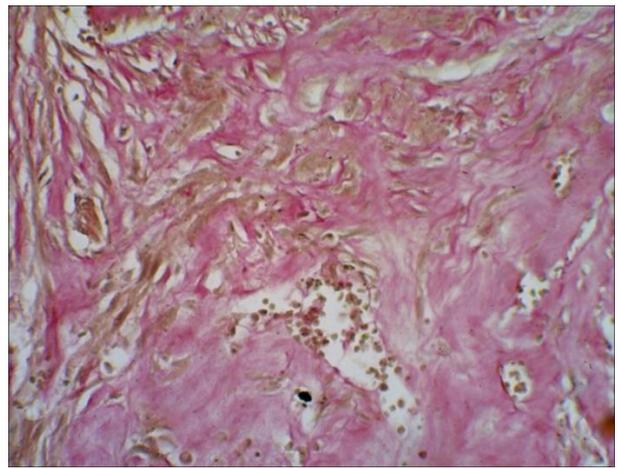


Fig. 1. Collagen fibers with preserved bundle structure in separate areas of hyaline degeneration. van Gieson staining. x200

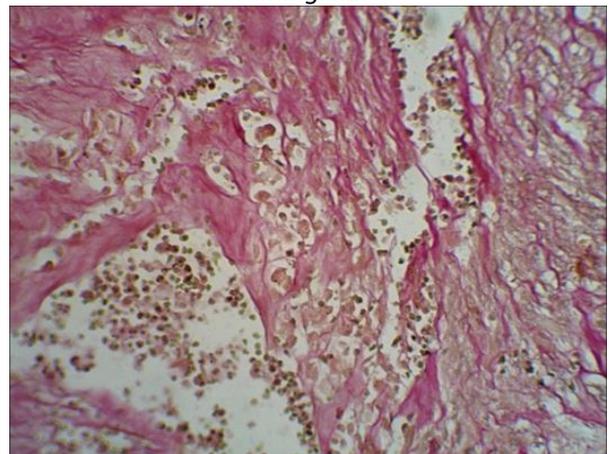


Fig. 2. Capillary, venous and arterial vessels found in the connective tissue. van Gieson staining. x200

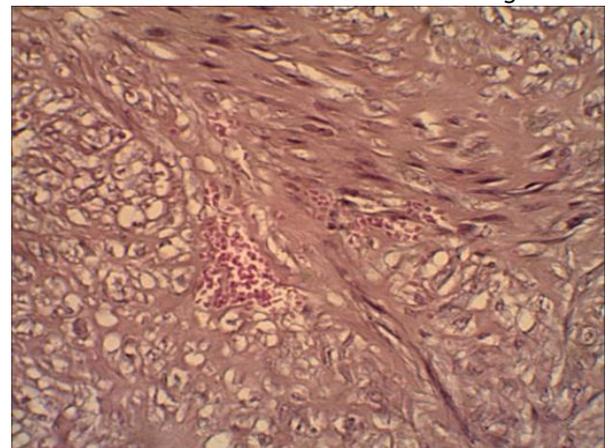


Fig. 3. Bundles of collagen fibers are substituted by muscle ones. van Gieson staining. x200

single and presented by fibroblasts, fibrocytes, lymphocytes and neutrophilic leukocytes. In the intact biometrium muscle bundles are well structured, possessing fibrous connective tissue between themselves. The muscular tissue in the visual field has from 5 to 8 vessels mainly arteries and veins with an even distribution in the tissue (Fig. 4).

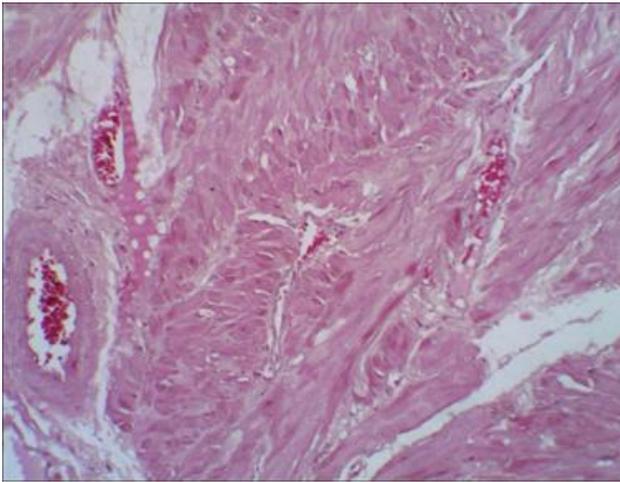


Fig. 4. Myometrium with venous and arterial vessels. Hematoxylin-eosin staining. x200

According to the evidence of certain researchers the scar after myomectomy can be formed from the rough fibrous connective tissue, sometimes it is very thin, the connective tissue fibers are located parallel and alternate with the myometrium cells. Considerably less often, after laparoscopic myomectomy with monopolar coagulation of myoma bed the scar is thick and formed chaotically located collagen fibers with a number of vessels with sclerosed walls [10].

Applying the method of conservative myomectomy during cesarean section the scar is thin with parallel located connective tissue fibers alternating with myometrium cells, the scar is vascularized at the expense of all types of vessels located unevenly.

Conclusions. 1. Restoration of the uterine haemodynamics during pregnancy in women after conservative myomectomy with application of advanced methods enables to restore the anatomical location of the uterine muscle fibers, ensures better reparative processes in the place of surgery and restoration of uterine circulation.

2. Vascularization of postoperational scar after myomectomy is restored at the expense of all types of vessels.

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