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SUMMARY

PhD THESIS

THE VALUE OF ULTRASONOGRAPHIC EVALUATION OF UTERINE SCAR AFTER CESAREAN SECTION FOR MATERNO-FETAL RISK APPRECIATION

Scientific coordinator: Prof. Univ. Dr. Bordeianu Ion

Phd Student: Dr. Panțuru (Şucu) Roxana Aura

CONSTANȚA

CONTENT

Keywords: uterine scar, hysterography, hysterotomy, cervical canal length, ultrasound, isthmus

I. INTRODUCTION

Technological progress in the medical world in recent decades is constantly rising and has an impact on all medical fields, including obstetrics. With this progress, which has led to an increase in the success rate of many surgical procedures and medical interventions, the survival rate of patients and their quality of life has also improved.

Thus, the study of medical sciences currently requires a multi-disciplinary approach both theoretical, practical and technical, to evaluate patients and especially pregnant women. "How can the quality of medical care and patient safety be improved?" Continuous, early, prophylactic, and evidence-based medical evaluation requires a practical and effective approach to certain medical situations such as pregnancy in a patient with uterine scar after a cesarean section.

The choice of certain medical procedures has also become an option for the patient. We are no longer in the stage where the doctor decides and the patient submits. From cosmetic interventions to decisions related to major operations, the patient is part of the decision-making act. The doctor is the one who has the duty to expose, clearly, depending on the cultural and professional training of the patient, each stage of the medical procedure. The patient is directly involved in the final decision, being familiar with the risks, the complications of the medical procedure, as well as with the short and long term consequences.

These criteria are also applied in the obstetrical field. There are pregnant women who want to give birth naturally at any cost, regardless of the risks explained while other women want a cesarean section from the beginning of pregnancy. The reasons for such situations are multiple and are based on aesthetic, family, religious, social or economic considerations.

Another recent aspect increasingly considered in any medical act is the quality of life after the procedure. There are numerous publications in the surgical, oncological and medical fields with reference to the impact of procedures on the long-term physical and mental parameters of patients. It analyzes from the intervention success in terms of the recurrence of the pathology to the way the patient perceives this success. Based on various questionnaires, physical and somatic aspects such as pain, mobility, ability to practice the profession or household activities are evaluated. Interaction with family, friends or the ability to travel is not excluded.

Thus, we are heading towards a medical stage in which patients' perceptions and the smallest consequences of the medical-surgical act, such as the details of post-operative scars, are brought to the fore. Integrating in this context the birth event and the implications of the cesarean section, the methodology of this study resulted.

II. STUDY HYPOTHESIS

Main objectives:

• Evaluation by transvaginal ultrasound of the length of the cervix in each trimester of pregnancy and postoperatively;

• Measurement of the distance between caesarean scar and the internal cervical ostium in each trimester of pregnancy and postoperatively evaluated by transabdominal ultrasound;

• Measurement of the distance between the cesarean scar section and the external cervical ostium in each trimester of pregnancy and postoperatively evaluated by transabdominal ultrasound;

• Determination of the thickness of the hysterorrhaphy scar by transabdominal ultrasound in the I, II and III trimester of pregnancy;

• Measurement by transabdominal ultrasound of the thickness of the uterine scar in the right, center, and left of the hysterorrhaphy in the third trimester of pregnancy at 30-34 and 37-40 weeks of gestation;

• The impact of uterine contractions on the thickness of the hysterorrhaphy scar;

• Intraoperative evaluation of cesarean old scar;

• Control at 6 weeks after birth with ultrasound evaluation of the cesareascar, the length of the cervical canal and the presence of the isthmocele;

If there are risk factors for the development of the isthmocele;

III. MATERIAL AND METHODS

We conducted a prospective study that included patients who gave birth by caesarean section and presented at a subsequent pregnancy to be monitored during pregnancy. The study was at the Bucur Maternity “St. Ioan ”, Hospital, Bucharest during 2016-2020.

Criteria for inclusion in the study:

• women who agreed to be included in the study and signed the informed consent;

• patients undergoing cesarean section;

• age between 16-45 years;

• the diagnosis of an intrauterine pregnancy;

• single intrauterine pregnancy;
• women at 6 weeks after delivery by caesarean section at;
• compliant patients who agreed to have pregnancy care pregnancy from the first trimester to term.

Exclusion criteria from the study

• males;
• women who refused to be included in the study;
• women under 16 and over 45 years of age;
• patients who did not give their consent for the study (psychiatric disorders);
• patients diagnosed with pathological pregnancy (ectopic);
• patients who did not want to keep the pregnancy and had an abortion on request (within legal limits);
• patients at their first pregnancy (primiparous);
• patients who had previous spontaneous births and not by cesarean section.
• multiple pregnancies (more than 2 fetus).

Parameters analyzed:

- age, environment of origin, number of previous cesarean operations, gestational age and indications of initial cesarean operations, year of first birth, number of years between births;

-peculiarities of pregnancy: hydramnios, diabetes, fetal macrosomia;

-gestational age at the time of examination;

-first trimester (5-12 weeks): scar thickness, cervical canal length, scar-internal cervical ostium distance, scar-external cervical ostium distance, other aspects;

-second trimester (20-25 weeks): scar thickness - center, right, left, cervical canal length, scar-internal cervical ostium distance, scar-external cervical ostium distance, other aspects;

-third trimester (30-34 weeks): scar thickness - center, right, left, cervical canal length, scar-internal cervical ostium distance, scar-external cervical ostium distance, uterine contractions, other aspects

-third trimester (37-40 weeks): scar thickness - center, right, left, cervical canal length, scar-internal cervical ostium distance, scar-external cervical ostium distance, uterine contractions, other aspects;

-postoperative aspects: scar thickness, cervical canal length, scar-internal cervical ostium distance, scar-external cervical ostium distance, other aspects

Statistical tests used:

Statistical analysis was performed using IBM SPSS Statistics 21.

IV. RESULTS

Epidemiological data

An initial analysis of the patients in the study was based on epidemiological features. 150 patients were included in the analyzed group. The patients included in the study were aged between 18 and 41 years, with a mean age of 29.26 years (standard deviation 5.044, CI: [28.45; 30.07]).

There is a slight decreasing trend in the average age for pregnant women in rural areas - 27.20 years (standard deviation 6,192, CI: [25.34; 29.03]), compared to those in urban areas - average age 30.14 years (standard deviation 4,196, CI: [29.33; 30.95]).

Regarding parity, of the 150 patients included in the study: 120 patients (80%) have an obstetric history with a cesarean section - of these, 3 (2.5% of patients with a single cesarean section) have a history of spontaneous birth, 27 patients (18%) have cesarean scar after 2 cesarean operations, and 3 patients (2%) uterine scar after 3 cesarean sections.

Indications for previous caesarean section.

Caesarean indications and other situations encountered in previous cesarean operations: cephalo-pelvic disproportion, both in 39 pregnant women (26%); uterine scar in 24 pregnant women (16%), of which double scar uterus in 9 pregnant women (6%); lack of labor progression in 18 pregnant women (12%); pelvic presentation in 12 pregnant women (8%); acute fetal distress, deflected presentation, in 9 pregnant women (6%); twin pregnancy, dilatation dystocia, , fetal macrosomia or dystocia, each in 6 pregnant women (4%). Other indications or special situations including: maternal pathology, strabismus (operated), intrapartum death - were each in less than 3 cases (less than 2%).

Particularities

During the study, the particularities of each pregnancy were monitored. Thus, fetal, maternal or adnexal pathologies were noted. Situations of polyhydramnios or fetal macrosomia have been reported. In the studied group, pathologies of amniotic fluid were highlighted in a number of 6 cases that recorded a percentage of 4% polyhydramnios.

Characteristics of the first trimester of pregnancy (5-12 weeks)

Of the 150 pregnant women followed, 69 (46%) underwent control in the first trimester of pregnancy. The majority - 21 patients (30.4%) - were monitored from the 6th week of pregnancy, and half of them came for control until 8 weeks of pregnancy. However, 81 patients (54%) did not had gynecologist evaluation in the first trimester of pregnancy.

For the 69 monitored pregnant women in the first trimester, the thickness of the scar from the previous cesarean section had values between 1.14 mm and 8.10 mm. Half of the patients had scar thicknesses below 3.5 mm. In the first trimester, the length of the cervical canal recorded values between 28 mm and 47 mm.

The distance between the cesarean scar and the internal cervical ostium was measured in 62 patients in the first trimester, this taking values between 3 and 33 mm. The scar-OCE distance had an average value of 38.89 mm (standard deviation 4.15, CI: [37.81; 39.96]) and a median value of 38 mm in the first trimester of pregnancy.No correlation was found between the scar distance - OCE and age, the number of previous cesarean sections or the time elapsed since the last birth. There was no evidence of correlation between the thickness of the scar and the patient's age or the time passed from the last cesarean section. There are no significant differences between the thickness of patients' scars from urban or rural areas.

Characteristics of the second trimester of pregnancy (20-25 weeks)

Gestational age

Among the 150 pregnant women followed, 54 (36%) underwent evaluation in the second trimester of pregnancy. For the 54 pregnant women monitored in the second trimester, the thickness of the scar from the previous cesarean section had values between 2 mm and 7.6 mm. The average value of the cervical canal in the second trimester was 33.11 mm (standard deviation 2.81, CI: [32.34; 33.87]). Compared to the first trimester, the length of the cervical canal decreased by 2.36 mm.

The distance between the hysterorrhaphic scar and the internal cervical ostium was measured in 30 patients in the second trimester, with values

between 2 and 21 mm, a mean distance of 9.62 mm (standard deviation 6.40, CI: [7.23; 12.01]) and a median value of 9.5 mm. Compared to the first trimester, the length of the cervical canal decreased by 2.36 mm.

The distance between the hysterography scar and the external cervical ostium was measured in 30 patients in the second trimester, with values between 33 mm and 53 mm, a mean distance of 37.9 mm (standard deviation 6.24, CI: [35.57; 40.23]) and a median value of 35.5 mm.

Characteristics of the third trimester of pregnancy (30-34 weeks)

Among the 150 pregnant women evaluated, 66 (44%) presented for control in the third trimester of pregnancy, from 30-34 weeks of pregnancy. 84 patients (56%) did not have a gynecologist evaluation during this period

In the 66 pregnant women who presented for evaluation in the 30-34 weeks of pregnancy:

• the thickness of the hysterography scar in the left half had values between 1.7 mm and 7 mm, with an average size of 3.18 mm (standard deviation 1.28, CI: [2.87; 3.50]);

• the thickness of the hysterography scar measured in the center had values between 1.9 mm and 6 mm, with an average size of 3.26 mm (standard deviation 1.15, CI: [2.97; 3.54]);

• the thickness of the hysterography scar on the right side took values between 1.9 mm and 6 mm, with an average size of 3.40 mm (standard deviation 1.11, CI: [3.13; 3.68]).

There is a decrease in the average thickness of the scar (in all three measurement points) in pregnant women who had 2 previous cesarean sections, compared to those who previously had only one cesarean section. So:

• when measuring the hysterorrhaphic scar in the left half, the average thickness of the scar was 3.5 mm (standard deviation 1.33, CI: [3.11; 3.88]) in pregnant women with a single cesarean section, respectively 2.4 mm (standard deviation 0.53, CI: [2.10; 2.69]) in pregnant women with 2 cesarean sections;

• when measuring the hysterography scar in the center, the average scar thickness was 3.51 mm (standard deviation 1.22, CI: [3.15; 3.86]) in pregnant women with a single cesarean section, respectively 2.6 mm (standard deviation 0.42, CI: [2.26 ; 2.43]) to those with 2 operations;

• when measuring the hysterography scar in the right half, the average thickness was 3.65 mm (standard deviation 1.17, CI: [3.31; 3.99]) in pregnant women with a single cesarean section, respectively 2.68 mm (standard deviation 0.57, CI: [2.35; 3.00]) to those with 2 cesarean sections.

A total of 21 of the pregnant women had uterine contractions in the 30-34 weeks of pregnancy. These represent 14% of the total number of pregnant women included in the analysis, respectively 35% of the pregnant women who presented for control during that period. Half of the patients with painful uterine contractions were over 32 years old.

There is a slight increase in mean age in pregnant women who presented with UC (uterine contractions), who were 31.57 years old (standard deviation 5.36, CI: [29.13; 34.01]), in contrast to pregnant women without UC, who had on average 28.92 years (deviation standard 3.14, CI: [27.91; 29.94]).

There is an increase in the incidence of uterine contractions over time since the last pregnancy. Half of the pregnant women who are less than 2 years old from the last pregnancy did not present UC at the monitoring in weeks 30-34, while half of the pregnant women with UC are over 4 years old from the last pregnancy.

Pregnant women who presented UC have on average 4.14 years from the last pregnancy (standard deviation 1.59, CI: [3.41; 4.86]), respectively 3.04 years (standard deviation 2.11, CI: [2.36; 3.73]) in the case of those without UC.

In the third trimester, weeks 30-34, pregnant women with UC have an average scar thickness at the center of 2.25 mm (standard deviation 0.5, CI: [2.19; 2.30]), and those without UC have a thickness of 3.8 mm (deviation standard 1.42, CI: [3.19; 4.44]). Application of the Mann-Whitney U test indicated that there were statistically significant differences between the center thickness of the scar measured for pregnant women with UC (mean range 19.57) and the thickness of scars of pregnant women who did not show UC at

30-34 weeks of pregnancy (mean range 36.38), U = 180,000, Z = -3,570, p <0.001.

In the third trimester, weeks 30-34, pregnant women with UC have an average scar thickness on the right side of 2.35 mm (standard deviation 0.16, CI: [2.17; 2.52]), and those without UC have a thickness of 3.95 mm (standard deviation 1.29, CI: [3.4; 4.4]). Application of the Mann-Whitney U test indicated that there were statistically significant differences between the scar thickness measured on the right side in pregnant women with UC (mean range 19.14) and that of pregnant women who did not show CUD at 30-34 weeks of pregnancy (mean range 36.62). , U = 171,000, Z = -3,736, p <0.001.

It is observed that in the case of pregnant women with UC in the 30-34 weeks of pregnancy, the length of the cervical canal measured in the second trimester is slightly shorter than in pregnant women without UC. Thus, they had an average cervical canal length of 31.33 mm (standard deviation 2.00, CI: [29.80; 32.87]), respectively 34.44 mm (standard deviation 2.76, CI: [33.35; 35.54]).

The measurement of the thickness of the hysterography scar was performed in 90 pregnant women (60% of the total) in the 37-40 weeks of pregnancy, showing the following:

• the thickness of the scar on the left side had values between 1 mm and 4.5 mm, with an average value of 2.70 mm (standard deviation 0.79, CI: [2.54; 2.87]);

• the thickness of the scar measured at the center had values between 1 mm and 5 mm, with an average value of 2.70 mm (standard deviation 0.83, CI: [2.53; 2.88]);

• the thickness of the scar on the right side had values between 1.19 mm and 5 mm, with an average thickness of 2.89 mm (standard deviation 0.82, CI: [2.72; 3.07]).

There is a decrease in the average thickness of the scar (in all three measurement points) in pregnant women who had 2 cesarean sections, compared to those who previously had only one cesarean section. So:

• when measured on the left side, the average thickness of the scar was 2.85 mm (standard deviation 0.69, CI: [2.69; 3.03]) in pregnant women with a single cesarean section, respectively 2.33 mm (standard deviation 0.95, CI: [1.90; 2.76]) in pregnant women with 2 cesarean sections;

• in the center, the average scar thickness was 2.80 mm (standard deviation 0.83, CI: [2.59; 3.00]) in pregnant women with a single cesarean section, respectively 2.51 mm (standard deviation 0.82, CI: [2.14; 2.89]) in those with 2 operations;

• on the right side, the average thickness was 2.93 mm (standard deviation 0.86, CI: [2.72; 3.14]) in pregnant women with a single cesarean section, respectively 2.84 mm (standard deviation 0.77, CI: [2.49; 3.20]) in those with 2 cesarean sections.

A number of 60 patients, representing 40% of all pregnant women included in the group, and 69% of those who were monitored in weeks 37-40, had uterine contractions.

Compared with weeks 30-34, in which the presence of UC was influenced by the pregnant woman's age, in weeks 37-40 of pregnancy, there were no statistically significant differences in the average age of pregnant women with UC and those without UC.

Of the 150 patients followed during pregnancy, 45 provided information on UC at both the 30-34 and 40-40 weeks. Thus, from one control to the next, the incidence of UC increased almost 4 times among the same group of pregnant women. If at the first monitoring (weeks 30-34), 9 patients out of 45 had UC (20%), in weeks 37-40, 33 patients (73.33%) had UC. A number of 9 patients (20%) presented UC at both follow-ups, while 12 patients (26.67%) did not present CUD at all in the third trimester.

As with previous monitoring, there are a number of differences between groups of pregnant women in terms of scar thickness. Thus, in the third trimester, weeks 37-40:

• pregnant women with UC have an average scar thickness on the left side of 2.6 mm (standard deviation 0.76, CI: [2.4; 2.8]), and those without UC have a thickness of 3.02 mm (standard deviation 0.79, CI: [2.71; 3.34]). Application of

the Mann-Whitney U test indicated that there were statistically significant differences between the scar thickness measured on the left side in pregnant women with UC (mean range 39.80) and that of pregnant women who did not show CUD at 37-40 weeks of pregnancy (mean range 53.33). , U = 558,000, Z = -2,342, p <0.05.

• pregnant women with UC have an average scar thickness at the center of 2.58 mm (standard deviation 0.76, CI: [2.38; 2.78]), and those without UC have a thickness of 3.06 mm (standard deviation 0.91, CI: [2.70; 3.42]), a difference that is not statistically significant.

• pregnant women with UC have an average scar thickness on the right side of 2.76 mm (standard deviation 0.83, CI: [2.55; 2.97]), and those without UC have a thickness of 3.1 mm (standard deviation 0.77, CI: [2.79; 3.41]). Application of the Mann-Whitney U test indicated that there were statistically significant differences between the right scar thickness measured in pregnant women with UC (mean range 39.88) and that of pregnant women who did not show UC at 37-40 weeks of gestation (mean range 53.17). , U = 562,500, Z = -2,291 p <0.05.

Of the 111 patients who were monitored intraoperatively, 12 (10.8%) presented In pregnant women who presented a free tranche, it is observed that the average distance between the old cesarean scar and OCE measured in the first trimester (40 mm, with standard deviation 3.29, CI: [38.7; 41.3]) is smaller compared to pregnant women who did not show a free trance (mean distance 38.3 mm, with standard deviation 4.75, CI: [36.42; 40.18]), the difference being significant, as shown after application Mann-Whitney test U. U = 207,000, Z = -2,748, p <0.05.

Other aspects

Aspects mentioned postoperatively in the 111 patients who came for evaluation:

• 81 patients have a normal evolution (73%);

• 6 patients have postpartum bleeding (4%) - not associated with UC in labor, areas of rupture, free sutures or areas of intraoperative dehiscence;

24 patients presented with istmocel (21.1%) - not associated with UC, areas of ruptures, free sutures or areas of intraoperative dehiscence. However, it is observed that in the case of patients who developed istmocel, the average thickness of the scar measured at the center in weeks 37-40 registered lower values compared to those without istmocel. Thus, in the case of patients with isthmocele, the mean thickness was 1.93 mm (standard deviation 0.49, CI: [1.62; 2.23]), respectively 3.01 mm (standard deviation 0.72, CI: [1.83; 3.2]) in the case of those without isthmocele .

V. The premises of a therapeutic algorithm

Starting from the premises of this study which were a detailed evaluation of the ultrasound characteristics of the uterine scar after cesarean section in each trimester of pregnancy we developed certain statements that can serve as an algorithm for monitoring pregnancy in patients with scar uterus.

Because the ultrasound evaluation of the cervix in the first trimester of pregnancy recorded low values in patients with older age and uterine scar, we propose additional attention to this parameter. These patients may be at risk of preterm birth in addition to the baseline risk of pregnancy. Moreover, it is observed that the average cervix length continues to decrease in the second trimester of pregnancy.

Moreover, long-term evaluation of cervix size in patients with uterine scar indicates that those with intraoperative dehiscences have small cervicometry sizes. Thus, it is recommended that these intraoperative aspects be properly noted in the patient's documents because they require a careful assessment not only of the subsequent scar, but also of the cervix. A similar effect on the cervix is in patients who go into labor with a pregnancy on a scarred uterus.

Although, there are no similar reports in the literature, the present study brings to light new ultrasound distances implemented such as: the distance between the hysterorrhaphic scar and the internal cervical ostium evaluated for each trimester of pregnancy. Thus, it was observed that in the first trimester of pregnancy it had an average size of 11.64 mm, being smaller in pregnant

women. So, once again a parameter that is to be verified in patients who want pregnancies at an increasingly advanced age especially in the context of assisted human reproduction techniques used more and more frequently.

Regarding uterine contractility, there was an increase in the incidence of painful uterine contractions over time since the last pregnancy. It could be said that the time from the previous cesarean section is a safe reason for the subsequent pregnancy, but it seems that this is not always the case, especially as the mother's age advances. Also, pregnant women with two or more cesarean sections are more likely to have painful uterine contractions as opposed to pregnant women with a single cesarean section. Which requires an increased clinical-paraclinical evaluation.

There is a higher incidence of uterine contractions in weeks 30-34 in pregnant women whose scars are less thick. Thus, it can be seen that the size of the scar is a defining element. Therefore, we recommend that patients with scars less than 2.5 mm in the third trimester benefit from tocolytic treatment because the consequences of early contractions can be uterine rupture or fetal morbidity, including prematurity.

In weeks 37-40 of pregnancy, pregnant women with UC have a lower average thickness of the scar on the right, left and center than patients without uterine contractions, which supports the previous recommendation of tocolysis. At the same time, it was observed that pregnant women with a lower average scar thickness measured in the first trimester entered labor more frequently. It is an extremely important issue that raises concerns since the first trimester and leads to proper pregnancy supervision.

In pregnant women who presented for evaluation in the 30-34 weeks of pregnancy, it was observed that the thickness of the hysterorrhaphic scar in the left half had average values of 3.18 mm; in the center of 3.26 mm and in the right side of 3.40 mm. At 37-40 weeks of pregnancy, the measurement of the thickness of the hysterography scar showed that the size of the scar on the left side had an average value of 2.70 mm, in the center of 2.70 mm and on the right side of 2.89 mm. Thus, it is observed that the uterine scar is influenced by the volume distension of the pregnant uterus with increasing gestational age. In addition, we see that the size of the scar is unequal at different points. Our

finding draws attention to the fact that an ultrasound evaluation in one place of the scar is not enough but must be done systematically along its entire length.

At the postoperative control, thinner scars are observed in pregnant women who have shown areas of dehiscence intraoperatively. According to our study, the isthmocele is not associated with uterine contractions, areas of rupture of the hysteroraphic scar, free sutures or areas of intraoperative dehiscence, so it seems that the tissues and the patient's healing capacity through the quality of connective fibers are the defining element to be evaluated.

The current study has several peculiarities. Ultrasound evaluation which has been extremely detailed in order to give attention to the fact that it must be thorough every semester for uterine scarring and at several points. We wanted to show that all these determinations are technically possible. That there are correlations with the intraoperative aspect.

Compared to other studies that aim to assess the quality of hysterorrhaphy scars after cesarean section for attempted safe vaginal labor after birth, we wanted to draw attention to thorough monitoring of pregnancy on the scar uterus. Through the above statements we have created some key points about patients at risk and who require additional supervision of the pregnancy compared to what the guidelines currently recommend. Additional studies can be done on the frequency of monitoring and implementation of our recommendations based on current research. What is certain is that the patient with a uterine scar is an increasingly common clinical entity and in the current context of defensive obstetrics requires more attention because the medical-socio-economic-legal implications can be multiple and long-term.

VI. CONCLUSIONS

1. Ultrasound evaluation of the cervix in the first trimester of pregnancy recorded values between 28 mm and 47 mm, with an average of 35.48 mm. During this trimester, it was observed that cervicometry is small in older patients.

2. Cervicometry in the second trimester of pregnancy had an average value of 33.11 mm, 2.36 mm lower than in the first trimester.

3. The postoperative ultrasound evaluation of the cervix had an average length of 32.96 mm. Small cervix sizes were noted in the elderly and in those with areas of dehiscence of the hysterorrhaphic scar.

4. Pregnant women who experienced uterine contractions during pregnancy had small cervical dimensions measured at 6 weeks postpartum.

5. The distance between the hysterorrhaphic scar and the internal cervical ostium in the first trimester of pregnancy had an average size of 11.64 mm, being smaller in pregnant women of advanced age.

6. The distance between the hysterography scar and the external cervical ostium in the first trimester had an average value of 38.89 mm. The size was not influenced by the patient's age, the number of previous cesarean sections or the time elapsed since the last birth but is diminished in patients with uterine suture dehiscences observed intraoperatively.

7. There has been an increase in the incidence of uterine contractions over time since the last pregnancy. Half of the pregnant women who are less than 2 years old from the last pregnancy did not present UC in the 30-34 weeks of gestation.

8. Pregnant women with two or more cesarean sections are more likely to have uterine contractions as opposed to pregnant women with a single cesarean section.

9. There is a higher incidence of uterine contractions in weeks 30-34 in pregnant women whose scars are less thick.

10. In the 30-34 weeks of pregnancy, pregnant women with uterine contractility had an average scar thickness in the left, right half and also in the center lower compared to pregnant women without UC at this gestational age.

11. It is observed that also in the 37-40 weeks of pregnancy there is a higher incidence of UC in pregnant women who have a longer period after the last cesarean section / pregnancy. Half of the pregnant women who were less than 2 years old from the last pregnancy did not show contractions at the present monitoring.

12. In weeks 37-40 of pregnancy, pregnant women with UC have a lower average thickness of the scar on the right, left and center than patients without painful uterine contractions.

13. There were no statistically significant differences between groups of pregnant women with / without pelvic pain regarding the pregnant woman's age, the number of previous cesarean sections or the length of the cervical canal, as identified by monitoring at 30-34 weeks.

14. It has been observed that there is a tendency for patients with contractions in the 30-34 weeks of pregnancy to show areas of intraoperative dehiscence.

15. Pregnant women with scarred uterus who have given birth have an average thickness of the scar measured in the first trimester lower than those without pelvic-abdominal pain. The length of the cervical canal is also reduced in patients with UC.

16. In pregnant women monitored in the first trimester, the thickness of the scar from the previous cesarean section had an average thickness of 3.87 mm. There were no correlations between the thickness of the scar and the patient's age or the time elapsed since the cesarean section.

17. In the second trimester, the thickness of the hysterography scar was between 2 mm and 7.6 mm, with an average thickness of 3.68 mm. Compared to the first trimester, the thickness of the scar measured in the second trimester of pregnancy decreased by an average of 0.19 mm. There are no correlations between the thickness of the scar measured in the second trimester and age, the number of previous cesarean operations or the time elapsed since the last cesarean section.

18. In pregnant women who presented for control in the 30-34 weeks of pregnancy, it was observed that the thickness of the hysterorrhaphy scar in the left half had average values of 3.18 mm; in the center 3.26 mm and on the right 3.40 mm.

19. In the 37-40 weeks of pregnancy, the measurement of the thickness of the hysterorrhaphy scar showed that the size of the scar on the left side had an average value of 2.70 mm, in the center of 2.70 mm and on the right side of 2.89 mm.

20. There is a decrease in the average thickness of the scar in all three measurement points in pregnant women who had several caesarean sections, in measurements from 30-34 weeks, and at 37-40 weeks of pregnancy.

21. Pregnant women with intact suture showed higher values of the thickness of the old cesarean section at all measurements during pregnancy compared to pregnant women who had intraoperative dehiscences. The intact suture is not

influenced by the pregnant woman's age, place of origin, number of previous cesarean operations or the period of time since the last cesarean section.

22. Intraoperatively, it was observed that the presence of dehiscence areas was associated with lower values of the thickness of the hysterography suture in all trimesters of pregnancy.

23. At the postoperative control, thinner scars are observed in pregnant women who have shown areas of dehiscence intraoperatively. At the end of lactation, most patients had a normal course, a small proportion had isthmocele and an insignificant number had postpartum bleeding.

24. According to our study, the isthmocele is not associated with uterine contractions, areas of rupture of the hysteroraphic suture, intact suture or areas of intraoperative dehiscence.

25. It is observed that in the case of patients who developed isthmocele, the average thickness of the scar measured at the center in the 37-40 weeks of pregnancy registered lower values compared to those without isthmocele.