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## COMPARATIVE RESULTS OF STUDYING THE COURSE OF PREGNANCY AND CHILDBIRTH WITH CONSERVATIVE AND SURGICAL CORRECTION OF CERVICAL INCOMPETENCE

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The purpose of this study was to research the methods of correction of cervical incompetence, a comparison of the features of the course of pregnancy and childbirth with conservative and surgical correction of cervical incompetence. Correction of cervical incompetence was performed in 100 pregnant women: in 50 with a conservative pessary and in 50 with two U-shaped cervical sutures. Treatment was carried out in hospital settings in 95 % of cases, and on an outpatient basis in 5 % of cases. In contrast to surgical correction of cervical incompetence, conservative correction by installing an obstetric unloading pessary allows for a non-traumatically resolved pregnancy, with a positive result. With conservative correction, the risk of miscarriage, the number of premature births and late miscarriages decreased by half. The results show that conservative correction allowed for pregnancy to be carried to term and a viable fetus to be born in 93.3 % of cases.

**Key words:** cervical incompetence, obstetric pessary, miscarriage, conservative correction, prevention of premature birth.

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## ПОРІВНЯЛЬНІ РЕЗУЛЬТАТИ ДОСЛІДЖЕННЯ ПЕРЕБІГУ ВАГІТНОСТІ ТА ПОЛОГІВ ПРИ КОНСЕРВАТИВНІЙ ТА ХІРУРГІЧНІЙ КОРЕКЦІЇ ІСТМІКО-ЦЕРВІКАЛЬНОЇ НЕДОСТАТНОСТІ

Метою даного дослідження було вивчення методів корекції істміко-цервікальної недостатності, порівняння особливостей перебігу вагітності та пологів при консервативній та хірургічній її корекції. Корекція істміко-цервікальної недостатності була проведена у 100 вагітних жінок: у 50 – за допомогою консервативного песарія і у 50 – за допомогою двох П-подібних швів на шийці матки. Лікування в 95 % випадків проводилося в стаціонарних умовах, у 5 % випадків – амбулаторно. На відміну від хірургічної корекції істміко-цервікальної недостатності, консервативна корекція методом встановлення розвантажувального акушерського песарія дозволяє вирішити вагітність атравматично і з позитивним результатом. При консервативній корекції ризик невиношування вагітності, кількість передчасних пологів і пізніх викиднів знизилися вдвічі. Результати показують, що консервативна корекція дозволила доносити вагітність до терміну і народити життєздатний плід у 93,3 % випадків.

**Ключові слова:** істміко-цервікальна недостатність, акушерський песарій, невиношування вагітності, консервативна корекція, профілактика передчасних пологів.

One of the most pressing problems in modern obstetrics is the problem of premature miscarriage. The frequency of premature births in different countries fluctuates between 5–13 %, and, according to World Health Organization, 15 million premature births occur annually worldwide. At the same time, the rate of growth of premature births does not decrease, the reason for this is the difficulty in identifying high-risk groups during routine antenatal examination [6, 7, 8].

Cervical incompetence (CI) is one of the main causes in the structure of noncarrying of pregnancy, accounting for 15–25 % of perinatal losses in the second trimester [12]. The lack of clear diagnostic criteria makes it difficult to determine the actual incidence of CI, but according to a number of authors, the occurrence rate varies within 0.5–1 % of all pregnant women [8]. According to the classical definition, CI is characterized by premature cervical “remodeling” before week 37 of pregnancy in the form of shortening, softening and dilation [11]. CI leads to the inability to carry a pregnancy to the optimal term due to a functional or organic cervical defect. This pathology is characterized by an asymptomatic course and no threat of termination at the time of diagnosis, however, prolapse of the fetal bladder followed by infection and premature rupture is possible with an increase in intrauterine pressure, which will still lead to early termination of pregnancy [3, 8, 10]. Currently, cervical incompetence is corrected by both conservative methods (use of vaginal progesterone, insertion of an obstetric pessary) and surgical methods (encircle the opening of the cervix, cerclage) [4, 9, 10]. There are also conflicting data on the use of combined correction methods; a number of authors note an increase in the effective prevention of premature birth, while others deny the effectiveness of this method [6].

**The purpose** of the study was to investigate the methods of correction of cervical incompetence, a comparison of the features of the course of pregnancy and childbirth with conservative and surgical correction of cervical incompetence.

**Materials and methods.** The study was conducted in the Department of Obstetrics and Gynecology II of Azerbaijan Medical University in the period of 2022–2024.

Correction of CI was performed in 100 pregnant women: in 50 with a conservative pessary and in 50 with two U-shaped cervical sutures. Treatment was carried out in hospital settings in 95 % of cases, and on an outpatient basis in 5 % of cases. The conservative pessary and surgical correction of the cervix were removed at the onset of premature labor or at 37–38 weeks of pregnancy. Duration of the pessaries and sutures in the women's uterus ranged from 1 to 29 (on average  $16.9 \pm 4.9$ ) weeks. After removing the pessary and syringing, the results of the vaginal examination and their comparison with the results before treatment showed positive dynamics. During the corrective treatment of CI, an increase in the cervical length to 15–20 mm was observed. Softening of the cervix consistency was also observed. Although we observe a soft cervix consistency in women with consecutive pregnancy up to 20 weeks of pregnancy, often the cervix can be slightly hard by the time of delivery.

The following statistical methods were used for analysis of numerical data: for quantitative variables, the mean ( $M$ ) and standard deviation ( $\sigma$ ) were calculated, and the results are presented as  $M \pm \sigma$ . To assess differences between groups, the Student's t-test for independent samples was applied to parametric data. For categorical data, such as genotype distribution, the chi-square ( $\chi^2$ ) test was used. This test helps to determine if there is a statistically significant difference in the frequency of different genotypes and alleles between groups.

Statistical significance was considered for  $p$ -values  $< 0.05$ , indicating significant differences between groups.

**Results of the study and their discussion.** The cervix did not significantly change its position along the adductor axis of the pelvis, however, cervical shortening in women pregnant for the first time and diagnosed with CI was noted in 13 (26 %) pregnant women at 16–20 weeks. Pregnancy ends in premature birth as a result of the opening of the external and internal os of the cervix during pregnancy and the development of CI at 22–30 weeks. However, conservative correction of cervical incompetence made it possible to carry the pregnancy to 36–38 weeks in 93.2 % of cases.

The cervical parameters were measured during ultrasound examination in dynamics before and 3–5 weeks after the correction of CI. Comparative analysis of ultrasound data in dynamics showed that the cervix lengthens from  $33.8 \pm 8.0$  mm to  $37.2 \pm 5.7$  mm ( $p < 0.05$ ) as the pregnancy period increases against the background of correction of the CI. Width of the cervix changed from  $23.75 \pm 4.8$  mm to  $27.25 \pm 3.6$  mm, diameter of the cervical canal – from  $2.6 \pm 4.1$  to  $0.6 \pm 1.5$  mm, diameter of the internal os – from  $3.1 \pm 5.5$  mm to  $1.7 \pm 3.3$  mm.

The results of the ultrasound examination indicate more objectively than the data of the vaginal examination that the correction of the CI improved the cervical condition, which allowed 93.2 % of patients to carry the pregnancy to term. In other words, ultrasound allows not only to diagnose cervical incompetence, but also to conduct dynamic monitoring of the cervical condition and the treatment being carried out.

When evaluating the treatment results in women pregnant for the first time based on the data of vaginal examination of the cervix length, its greatest shortening is noted at 16–20 and 21–30 weeks. Greater softening of the cervix, its centering along the pelvic axis in most cases, as well as opening of the external and internal os to the width of one or two fingers is observed during these periods. 13 (26 %) women showed a shortening of the cervix (19–25.5 mm) over time during the first pregnancy, and these pregnancies were saved by installing a conservative corrective pessary in a timely manner at 20–30 weeks of pregnancy. As a result, we were able to prevent 13 (26 %) premature miscarriages. The cervix in women who are repeatedly pregnant shortens throughout the pregnancy. According to ultrasound data, the treatment gives a positive result, which is manifested in the lengthening of the cervix after correction, positive changes in the condition of the cervical canal and internal os.

The frequency of hospitalizations due to the risk of premature birth in the examined pregnant women averaged  $1.9 \pm 1.3$ : 24 % of pregnant women were hospitalized once, 18 % – twice, 15 % – 3 and more times. Other pregnancy complications were also observed in the hospital: mild and moderate anemia in 33 %, fetoplacental insufficiency and intrauterine fetal hypoxia in 39 %, intrauterine growth retardation in 9 %, gestosis in 19 %, hypertensive syndrome in 19 %, hypotension in 13 %, exacerbation of chronic pyelonephritis in 5.1 % of women. Against the background of conservative (obstetric pessary in 50 pregnant women) and surgical (50 pregnant women) correction of cervical incompetence, colpitis was observed in 35 % of pregnant women. The Trendenburg method was used on a long-term inpatient basis to treat 20 pregnant women with Stage I cervical incompetence (cervical length over 30 mm) and the risk of premature birth.

Treatment of complications revealed by bacteriological examination of the cervix was carried out by sanitation with multicomponent antiseptic drugs (terzhinan, polygynax, hexicon) in 14-day courses, antibacterial therapy taking into account the gestational age and clinical picture, as well as drugs that improve uteroplacental circulation, and multivitamins. Hospitalization was required with sufficient frequency due to the risk of pregnancy failure with statistical significance ( $p < 0.05$ ). Timely births (37–41 weeks) occurred in 46 (92 %) women after conservative correction, in 32 (64 %) after surgical correction. Premature births (26–36 weeks) were observed in 2 (4 %) pregnant women after conservative correction, in 13 (26 %) after surgical correction.

Spontaneous abortions (19–25 weeks) occurred only in pregnant women with surgical correction of cervical incompetence (4 women – 8 %). In 8 (6.7 %) pregnant women, delivery was performed by cesarean section. Indications for surgical delivery were: high myopia, uterine scar, moderate and severe gestosis, chronic fetoplacental insufficiency, narrow pelvis, labor discoordination, premature placental abruption. Induction of labor by amniotomy was performed in 39 (32.5 %) patients at the normal gestational age. Indications for amniotomy were: normal pregnancy, moderate gestosis, and chronic fetoplacental insufficiency.

The overall frequency of occurrence of characteristics of labor, the course of the postpartum period and the condition of the newborns is presented in Table 1.

Table 1

**Characteristics of labor, the course of the postpartum period, and the condition of the newborns in pregnant women with cervical incompetence**

Characteristics of labor and the condition of the newborns	Absolute number	%
Term labor	84	70
Preterm delivery	19	15.8
Miscarriages	6	5
Caesarean section	8	6.6
Inducted labor	6	5
Normal birth activity	91	75.8
Congenital anomalies	7	5.8
Weak fertility	12	10
Discoordinated birth activity	11	9.2
Oxytocia	4	3.3
Prolonged labor	2	1.7
Amniotic fluid leakage before birth	22	18.3
Amniotomy	39	32.5
Episiotomy	57	47.5
1st degree cervical laceration	8	6.6
Cracks in the cervical mucosa	2	1.7
Postpartum hemorrhage	1	0.8
Intrauterine growth retardation	2	1.7
Fetal cerebral ischemia	1	0.8
Fetal cephalhematoma	0	0
Fetal developmental defects	1	0.8

Analysis of the course of labor in women with CI revealed that 7 (5.8 %) women had labor anomalies, 22 (18.3 %) – leakage of amniotic fluid before delivery, 39 (32.5 %) – amniotomy, 8 (6.6 %) – soft tissue injury. In 2 cases (0.8 %), postpartum hemorrhage was noted. The total duration of labor was  $6.5 \pm 2.5$  hours:  $7.1 \pm 2.8$  hours in the first birth and  $5.8 \pm 2.0$  hours in repeated births. Normal labor was observed in 112 (93.3 %), accelerated labor – in 4 (3.3 %), protracted labor – in 4 (3.3 %) women. In general, the examined women showed a tendency to reduce the duration of labor. A comparative analysis with a group of women without cervical incompetence showed that cervical incompetence is characterized by faster labor ( $p < 0.05$ ). Blood loss during childbirth averaged  $279 \pm 90$  ml. Postpartum hemorrhage was noted in 1 (0.8 %) patient. Hypotonic intrauterine growth retardation was observed in 8% of newborns. According to the Apgar scale, the assessment in the first minute after childbirth was 4–5 points in 2 (1.7 %), 6–7 points in 10 (8.3 %), 8 points in 108 (90 %) newborns.

Thus, the frequency of miscarriage in pregnant women with CI was 6.7 %, and labor was characterized by a short duration.

Considering that our studies used two methods of CI correction (conservative and surgical correction), we studied the features of the course of pregnancy and childbirth in pregnant women depending on the method of CI correction (Table 2).

Table 2

**Features of the course of pregnancy and childbirth depending on the method of cervical incompetence correction**

Criteria studied	Method of CI correction		P 1-2
	Conservative CI correction (1) (n=50)	Surgical CI correction (2) (n=50)	
Frequency of hospitalizations due to the threat of miscarriage:			
0	0	0	0.1
1	50	50	0.001
2	3	15	<0.01
3 and more	2	14	<0.05
Infectious complications			
Colpitis	14	8	<0.05
Polyhydramnios	2	4	0.2
Results of childbirth			
Timely delivery	46	32	0.2
Premature delivery	2	13	0.2
Methods of delivery			
Vaginal delivery	48	45	<0.001
Caesarean section	2	5	<0.001
Features of labor			
Disorders of labor (weakness, incoordination)	17	17	0.5
Premature rupture of membranes	14	9	0.3
Episiotomy	25	8	<0.001
Soft tissue damage (cracks and posterior adhesions of the mucous membrane of the uterine cavity)	6	18	<0.05
1st degree cervical rupture	3	11	<0.001
Duration of labor			
Average duration of labor, hours (M±σ)	6.8±3.2	6.4±2.4	>0.05
Normal	46	29	<0.05
Accelerated	1	18	<0.05
Protracted	3	3	0.3

The surgical correction of cervical incompetence resulted in significantly more ( $p<0.05$ ) hospitalizations due to the risk of miscarriage, while the number of hospital days was lower when using a conservative pessary. Unlike surgical correction, when installing an obstetric pessary, cervical sanitation was performed more often due to the development of colpitis. With different methods of correction of cervical incompetence, the pregnancy outcome differed in the number of timely and premature births ( $p<0.05$ ). The number of operative births with cervical suturing was higher than with conservative correction. When using a conservative pessary, 93.3 % of births ended naturally. At the same time, early rupture of membranes, episiotomy, soft tissue injuries were prevalent. Spontaneous births after surgical correction were often characterized by cervical ruptures (11 women – 22 %) and precipitated labor (4 women – 8 %).

According a number of studies, the most effective technique is considered to be laparoscopic cervical cerclage performed via a transabdominal approach. In cases of uncomplicated cervical insufficiency, transvaginal cerclage remains the most frequently utilized procedure. However, research indicates that 11–53 % of patients undergoing transvaginal cerclage still experienced pregnancy loss. In contrast, women in whom transvaginal cerclage failed and subsequently underwent transabdominal cerclage achieved live birth rates exceeding 90 % [1, 2, 8]. In our study the frequency of miscarriage in pregnant women with CI was 6.7 %, thus the correction of the CI improved the cervical condition, which allowed 93.2 % of patients to carry the pregnancy to term. We assessed these results as a successful. In addition, we were able to prevent 13 (26 %) premature miscarriages by installing a conservative corrective pessary in a timely manner at 20–30 weeks of pregnancy.

Huang X, et al (2016) revealed that the laparoscopic cervical cerclage site is close to the internal cervical os, which can greatly reduce the possibility of surgical failure caused by low cerclage position.

Compared with transvaginal cervical cerclage, laparoscopic cervical cerclage is more complicated, the cerclage band can only be removed by cesarean section, and there is an increased risk of pelvic adhesion and bladder injury [4]. In our work as a result of treatment the diameter of the internal os changed from  $3.1 \pm 5.5$  mm to  $1.7 \pm 3.3$  mm, which impacted positively on outcomes.

Li W et al (2020), noted that of the 10 patients they treated, 60 % became pregnant within 1-2 months after surgery. Among them, one patient had previous cervical loop electrosurgical excision procedure, and 1 patient had 2 previous unsuccessful transvaginal cervical cerclage procedures. In their study, the mean blood loss during laparoscopic cervical cerclage surgery before pregnancy was very small ( $27 \pm 16.16$  ml), and no surgical complications were observed [5]. However, in contrast to our contingent the authors observed the patients with intrauterine adhesions (IUAs) combined with cervical insufficiency. For these group of patients, laparoscopic cervical cerclage offers greater advantages than disadvantages, as it plays a key role in improving live birth rates. Women with IUAs have a heightened risk of miscarriage, and when CI is also present, the likelihood of second- or third-trimester pregnancy loss or preterm delivery is significantly higher with transvaginal cerclage compared to the laparoscopic approach [5]. Thus, for our patients without IUAs conservative management was effective and it allowed for pregnancy to be carried to term fetus to be born in 93.3 % of cases.

### Conclusions

1. A comparative analysis with a group of women without cervical incompetence showed that cervical incompetence is characterized by faster labor ( $p < 0.05$ ).

2. Despite the frequent risk of early termination of pregnancy with cervical incompetence, its conservative correction allowed for pregnancy to be carried to term and a viable fetus to be born in 93.3 % of cases.

Thus, in contrast to surgical correction of cervical incompetence, conservative correction by installing an obstetric unloading pessary allows for a non-traumatically resolved pregnancy, with a positive result, within the established time frame. With conservative correction, the risk of miscarriage, the number of premature births and late miscarriages decreased by half. The results show that conservative correction is an effective and economically sound method in our time and can be widely used to prevent premature births.

### References

1. Djaghanov O. Diagnosis and management tactics of patients with isthmico-cervical insufficiency. *International Journal of Medical Sciences*. 2025; 1(1): 532–539. Retrieved from <https://inlibrary.uz/index.php/ijms/article/view/72090>.
2. Fan YW, Chen WH, Wang XJ, Pu YY, Liu HY. [Analysis of the effect of modified cervical cerclage in the treatment of cervical insufficiency]. *Zhonghua Fu Chan Ke Za Zhi*. 2021 Sep 25;56(9):609-615. Chinese. doi: 10.3760/cma.j.cn112141-20210407-00178.
3. He D, Zhao D. Analysis of the Timing of Cervical Cerclage Treatment in Pregnant Women with Cervical Insufficiency and the Effect on Pregnancy Outcome. *Emerg Med Int*. 2022 Jun 30;2022:8340009. doi: 10.1155/2022/8340009.
4. Huang X, Ma N, Li TC, Guo Y, Song D, Zhao Y, et al. Simplified laparoscopic cervical cerclage after failure of vaginal suture: technique and results of a consecutive series of 100 cases. *Eur J Obstet Gynecol Reprod Biol*. 2016 Jun;201:146-50. doi: 10.1016/j.ejogrb.2016.04.008.
5. Li W, Li Y, Zhao X, Cheng C, Burjoo A, Yang Y, et al. Diagnosis and treatment of cervical incompetence combined with intrauterine adhesions. *Ann Transl Med*. 2020 Feb;8(4):54. doi: 10.21037/atm.2019.12.148.
6. Miller ES, Sakowicz A, Grobman WA. The association between cervical dysplasia, a short cervix, and preterm birth. *Am. J. Obstet Gynecol*. 2015. Vol. 213. P. 543. DOI: 10.1016/j.ajog.2015.06.036.
7. Mishchenko VP, Rudenko IV, Likhachov VK, Gromova AM, Tarasenko KV. Folate cycle drugs in the complex preventive therapy for the miscarriage. *World of medicine and biology*. 2021; 2 (76): 93–98. <http://dx.doi.org/10.26724/2079-8334-2021-2-76-93-98>.
8. Sentilhes L, Sénat MV, Ancel PY, Azria E, Benoist G, Blanc J, et al. Prevention of spontaneous preterm birth: Guidelines for clinical practice from the French College of Gynaecologists and Obstetricians (CNGOF). *Eur J Obstet Gynecol Reprod Biol*. 2017 Mar;210:217-224. doi: 10.1016/j.ejogrb.2016.12.035.
9. Summers JE, Kuper SG, Foster TL. Transabdominal Cerclage. *Clin Obstet Gynecol*. 2016 Jun;59(2):295-301. doi: 10.1097/GRF.000000000000183. PMID: 26959347.
10. Tarca AL, Fitzgerald W, Chaemsaitong P, Xu Z, Hassan SS, Grivel JC, et al. The cytokine network in women with an asymptomatic short cervix and the risk of preterm delivery. *Am J Reprod Immunol*. 2017 Sep;78(3):e12686. doi: 10.1111/aji.12686.
11. Thakur M, Jenkins SM, Mahajan K. Cervical Insufficiency. 2024 Oct 6. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. PMID: 30247829.
12. Vink J, Feltovich H. Cervical etiology of spontaneous preterm birth. *Semin Fetal Neonatal Med*. 2016 Apr. Vol. 21(2). P. 106–112. DOI: 10.1016/j.siny.2015.12.009.

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