Fertil Gynecol Androl. 2022 December; 2(1):e131414. https://doi.org/10.5812/fga-131414.

Published online 2023 January 8. **Case Report**

Cervical Insufficiency May Be Aggravated by Glucose Intolerance: A Case Report

Fatemeh Rashidi [1], Nafiseh Saedi [2,*], Nasim Shokouhi [2] and Seyyed Mohammad Mehdi Hosseini [3]

[1] School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
[2] Department of Obstetrics and Gynecology, Yas Hospital, Tehran University of Medical Sciences, Tehran, Iran
[3] Department of Internal Medicine, Faculty of Medicine, Ardabil Branch, Islamic Azad University, Ardabil, Iran

[*] *Corresponding author*: Department of Obstetrics and Gynecology, Yas Hospital, Tehran University of Medical Sciences, Tehran, Iran. Email: gynecologyobstetrics.tums@yahoo.com

Received 2022 September 04; **Accepted** 2022 December 13.

Abstract

Background: Cervical insufficiency occurs in the second trimester. Herein, we report a successful term pregnancy in a woman with glucose intolerance and a history of cervical insufficiency after two consecutive preterm deliveries in the second trimester.
Case Presentation: We present a 35-year-old woman, G3P2L0, with a history of two preterm deliveries in the second trimester. In the second pregnancy, vaginal cerclage at the 18th gestational week did not prevent premature delivery. Following two pregnancies with borderline fasting blood sugar (FBS) results, we decided to further evaluate the gestational diabetes mellitus (GDM) state with a two-hour postprandial (2 hpp) glucose test and glucose tolerance test (GTT). By impaired 2 hpp and GTT results, an insulin regimen was started with subsequent vaginal cerclage in the third pregnancy. She delivered a healthy 2,750-g girl at 38 weeks of gestation by tight blood sugar control.
Conclusions: More attention should be paid to evaluating glucose intolerance in pregnancy, especially in patients with cervical insufficiency. Blood glucose control in these patients can probably improve pregnancy outcomes.

Keywords: FBS, GTT, Cervical Insufficiency, IR, GDM, PROM

1. Introduction

An incompetent cervix is well-recognized as a cause of mid-trimester miscarriage, recurrent mid-trimester pregnancy loss, and preterm labor presenting with bulging membranes and no uterine contractility (1). Cervical insufficiency is treated surgically by cervical cerclage, which involves sutures or synthetic tape to reinforce the cervix. An intravaginal cervical cerclage is more common than a transabdominal or laparoscopic cervical cerclage. Cervical cerclage can also be performed through the abdomen, although this is less common (2). Also, according to a recent meta-analysis, cervical insufficiency can be treated by both laparoscopic and trans-abdominal cerclage with positive effects on preserving pregnancy (3).

If cervical insufficiency has resulted in preterm birth or mid-trimester loss despite the placement of a cervical cerclage, the appropriate treatment is uncertain. According to a systematic review, transabdominal cerclage is suggested as it may be associated with fewer perinatal deaths and complications. However, it may also be associated with a higher risk of severe complications during surgery than transvaginal cerclage (4). The risk of preterm birth is increased with diabetes or glucose intolerance (5).

A cervical insufficiency accounts for 14.3 - 65% of preterm births, which is a leading cause of pregnancy loss (6). It will be possible to prolong the pregnancy as long as possible if cervical insufficiency is adequately managed. This would ultimately result in fewer treatment and rehabilitation costs for preterm children (7). Therefore, cervical insufficiency will probably be handled by controlling blood glucose.

Screening for gestational diabetes is suggested by the WHO between 24 and 28 weeks of gestation (8). But cervical insufficiency generally occurs mid-trimester (4) before diabetes screening. This case report emphasizes the importance of assessing glucose levels in early pregnancy in patients with a history of cervical insufficiency.

2. Case Presentation

A 35-year-old woman, G3P2L0, was visited in the obstetrics clinic at Yas Hospital, Tehran, Iran, at 10 weeks of gestation with a history of two second-trimester preterm deliv-

eries. Two previous preterm deliveries occurred with typical cervical insufficiency presentation (cervix opened and membranes prolapsing most classically associated with painless) (9). The first pregnancy led to the 23rd week of delivery without any medical history. The second pregnancy also ended at 23 weeks and six days of pregnancy despite having a vaginal cerclage at the 14th week and progesterone and aspirin administration.

At the first obstetric visit of the third pregnancy, a physical examination revealed a healthy-looking, stable patient with normal findings on general examination. The abdomen was soft with no tenderness and a palpable mass. The vaginal examination showed normal. Her body mass index (BMI) was 23 kg/m^2. A urine culture and sensitivity test were performed, besides a vaginal culture for bacterial vaginosis. She had no vaginitis or cervicitis.

In her first two pregnancies, FBS was 96 mg/dL (normal fasting glycemic in healthy pregnancies is 69 - 75 mg/dL or 3.83 - 4.16 mmol/L) (10). The first prenatal visit of the first trimester also showed a value of 91 mg/dL, with no further evaluation later. In the third pregnancy, the initial assessment of FBS was reported as 95 mg/dL. Afterward, a two-hour postprandial (2 hpp) test showed 128 mg/dL, and the 75-g glucose tolerance test (GTT) showed abnormal (FBS: 97 mb/dL, one hour after 100 g glucose: 180 mg/dL and two hours after 75-g glucose: 165 mg/dL). In the previous pregnancy, 2 hpp and GTT were not measured after a normal repeated FBS test. By diagnosing GDM, insulin was administered eight units per day and was gradually increased to 80 units per day. Additionally, aspirin was given due to her age and the history of preterm birth. She was also given vaginal progesterone for its key function in avoiding preterm birth.

In the third pregnancy, fetal nuchal translucency at the 12th week was 1.2 mm, and the cervical length was 35 mm. Due to a history of spontaneous preterm labor and cervical insufficiency, we performed cerclage the 13th week after the normal result of cell-free DNA with XX karyotype.

Physical activity reduction, such as prolonged standing and frequent, repetitive lifting, was recommended for the patient. To monitor the pregnancy's health, Nonstress Test (NST) and Biophysical Profile (BPP) were taken twice a week from the 34th week due to her GDM.

The pregnancy lasted until 38 weeks and four days. Due to the maternal request, a cesarean section was performed. A healthy 2,750-g girl was born. Blood sugar reached the normal range after delivery.

3. Discussion

We showed that early GDM diagnosis and insulin management could enhance a woman's pregnancy outcome with previous preterm labor and cervical insufficiency. When there is cervical insufficiency, gestational diabetes should be assessed further, and insulin should be administered early if gestational diabetes is suspected. By carefully controlling blood glucose levels, patients with cervical insufficiency can reduce the number of premature births and avoid abdominal cerclage. The combination of vaginal cerclage and glucose control can also result in a positive outcome in patients with glucose intolerance disorders.

Cervical insufficiency was strongly predicted in women with a history of diabetes, and high prevalence rates were recorded in diabetic women (11).

In women with gestational diabetes, Premature Rupture of Membranes (PROM) and preterm labor is one of the most common complications during pregnancy, which is the leading cause of perinatal mortality and morbidity (12). Furthermore, a study found that premature birth is the main morbidity risk factor associated with maternal diabetes metabolic control (13). It is also widely recognized that a history of preterm birth increases the risk of preterm birth (14). We attained a successful in-term delivery despite a previous preterm delivery and glucose intolerance due to managing glucose levels.

3.1. Conclusions

There should be a greater emphasis on glucose intolerance testing in women with cervical insufficiency. Control of blood glucose with routine cervical cerclage may improve pregnancy outcomes for these patients, thereby reducing the need for abdominal cerclage.

Footnotes

Authors' Contribution: Study concept and design: F. R. and N. S.; Analysis and interpretation of data: F. R. and N. S.; Drafting of the manuscript: S.M.M.H; Critical revision of the manuscript for important intellectual content: N.SH.

Conflict of Interests: The authors declare no competing interests regarding any contents published in this study, such as funding or research support. Employment, personal financial interests, stocks or shares in companies, consultation fees, and patents: None is declared.

Ethical Approval: This study was conducted according to the Helsinki Declaration and approved by the local institutional board. This case had an ethical code from TUMS IRB.

Funding/Support: There was no funding/support.

Informed Consent: Written informed consent was obtained from the patient to publish this case report and any accompanying images.

References

1. Mastrolia SA, Baumfeld Y, Hershkovitz R, Yohay D, Trojano G, Weintraub AY. Independent association between uterine malformations and cervical insufficiency: a retrospective population-based cohort study. *Arch Gynecol Obstet*. 2018;**297**(4):919–26. [PubMed ID: 29392437]. https://doi.org/10.1007/s00404-018-4663-2.
2. 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;**8**(4):54. [PubMed ID: 32175348]. [PubMed Central ID: PMC7049037]. https://doi.org/10.21037/atm.2019.12.148.
3. Marchand G, Taher Masoud A, Azadi A, Govindan M, Ware K, King A, et al. Efficacy of laparoscopic and trans-abdominal cerclage (TAC) in patients with cervical insufficiency: A systematic review and meta-analysis. *Eur J Obstet Gynecol Reprod Biol*. 2022;**270**:111–25. [PubMed ID: 35042177]. https://doi.org/10.1016/j.ejogrb.2022.01.002.
4. Zaveri V, Aghajafari F, Amankwah K, Hannah M. Abdominal versus vaginal cerclage after a failed transvaginal cerclage: a systematic review. *Am J Obstet Gynecol*. 2002;**187**(4):868–72. [PubMed ID: 12388966]. https://doi.org/10.1067/mob.2002.126959.
5. Tanner LD, Tucker LY, Postlethwaite D, Greenberg M. Maternal race/ethnicity as a risk factor for cervical insufficiency. *Eur J Obstet Gynecol Reprod Biol*. 2018;**221**:156–9. [PubMed ID: 29306181]. https://doi.org/10.1016/j.ejogrb.2017.12.009.
6. Arabin B, Alfirevic Z. Cervical pessaries for prevention of spontaneous preterm birth: past, present and future. *Ultrasound Obstet Gynecol*. 2013;**42**(4):390–9. [PubMed ID: 23775862]. [PubMed Central ID: PMC4282542]. https://doi.org/10.1002/uog.12540.
7. Di Renzo GC, Roura LC, Facchinetti F, Antsaklis A, Breborowicz G, Gratacos E, et al. Guidelines for the management of spontaneous preterm labor: identification of spontaneous preterm labor, diagnosis of preterm premature rupture of membranes, and preventive tools for preterm birth. *J Matern Fetal Neonatal Med*. 2011;**24**(5):659–67. [PubMed ID: 21366393]. [PubMed Central ID: PMC3267524]. https://doi.org/10.3109/14767058.2011.553694.
8. Alberti KG, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus provisional report of a WHO consultation. *Diabet Med*. 1998;**15**(7):539–53. [PubMed ID: 9686693]. https://doi.org/10.1002/(SICI)1096-9136(199807)15:7<539::AID-DIA668>3.0.CO;2-S.
9. Shennan A, Jones B. The cervix and prematurity: aetiology, prediction and prevention. *Semin Fetal Neonatal Med*. 2004;**9**(6):471–9. [PubMed ID: 15691785]. https://doi.org/10.1016/j.siny.2004.09.001.
10. Parretti E, Mecacci F, Papini M, Cioni R, Carignani L, Mignosa M, et al. Third-trimester maternal glucose levels from diurnal profiles in nondiabetic pregnancies: correlation with sonographic parameters of fetal growth. *Diabetes Care*. 2001;**24**(8):1319–23. [PubMed ID: 11473063]. https://doi.org/10.2337/diacare.24.8.1319.
11. Anum EA, Brown HL, Strauss J3. Health disparities in risk for cervical insufficiency. *Hum Reprod*. 2010;**25**(11):2894–900. [PubMed ID: 20643692]. [PubMed Central ID: PMC2955555]. https://doi.org/10.1093/humrep/deq177.
12. Ji X, Wu C, Chen M, Wu L, Li T, Miao Z, et al. Analysis of risk factors related to extremely and very preterm birth: a retrospective study. *BMC Pregnancy Childbirth*. 2022;**22**(1):818. [PubMed ID: 36335328]. [PubMed Central ID: PMC9636775]. https://doi.org/10.1186/s12884-022-05119-7.
13. Niesen M, Jährig D. Das Neugeborene der diabetischen Mutter. *Der Gynäkologe*. 1998;**31**(1):76–84. https://doi.org/10.1007/s001290050226.
14. Brown R, Gagnon R, Delisle MF. No. 373-Cervical Insufficiency and Cervical Cerclage. *J Obstet Gynaecol Can*. 2019;**41**(2):233–47. [PubMed ID: 30638557]. https://doi.org/10.1016/j.jogc.2018.08.009.