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Success Rate of Mechanical Dilatation for Termination of Pregnancy

Berhe Tesfai*, Kibreab Asrat and Okbu Frezgi

Department of Obstetrics and Gynecology, Orotta National Referral Maternity Hospital, Ministry of Health, Asmara, Eritrea.

***Correspondence:**
Berhe Tesfai, MD, Department of Obstetrics and Gynecology, Orotta National Referral Maternity Hospital, Ministry of Health, Asmara, Eritrea, Obstetrician and Gynecologist, https://orcid.org/0000-0003-1820-7395.

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ABSTRACT

A multigravida obese mother with a previous history of pregnancy terminated for severe preeclampsia, presented with severe preeclampsia at early pregnancy complicated with pleural effusion, ascites, and HELLP syndrome with severe thrombocytopenia. She took 8 doses of misoprostol, and the cervix was still uneffeced. Mechanical dilatation with a uterine catheter was used instead of cesarean section, and she delivered without complication. Thus, this technique can be used as an alternative to cesarean section for special cases where cesarean section and misoprostol could have higher maternal morbidity and mortality.

Keywords

Mechanical dilatation, Uterine catheter, Pregnancy termination.

Introduction

Mechanical methods are among the oldest techniques used for cervical ripening and induction of labor. Compared with pharmacological agents, they are inexpensive, easy to store, and associated with fewer systemic side effects and a lower risk of uterine tachysystole [1]. Balloon catheters are considered a suitable option for women with a previous cesarean section who require induction of labor with an unfavorable cervix. Both the Society of Obstetricians and Gynecologists of Canada and ACOG support their use in carefully selected women undergoing trial of labor after cesarean (TOLAC) [2,3].

Single-balloon catheters, commonly Foley catheters, are inserted through the cervical os into the extra-amniotic space and inflated with saline to promote mechanical dilation [4,5]. Application of traction may shorten the time to catheter expulsion, although it has minimal effect on overall delivery time [6]. Evidence also suggests that removing the catheter after 12 hours and initiating oxytocin may increase the likelihood of vaginal delivery within 24 hours without increasing cesarean rates [7,8]. Larger balloon volumes, such as 60 mL, may improve delivery outcomes compared with smaller balloons [5]. Double-balloon catheters use balloons positioned on both sides of the cervix to enhance ripening and have shown outcomes comparable to single-balloon catheters in randomized trials [9-11]. After catheter removal or expulsion, oxytocin induction and amniotomy are commonly performed when feasible [12].

Case Report

A 30-year-old woman, Gravida 2, presented with severe preeclampsia at 26 weeks gestation, complicated by symptoms such as blurred vision and no gum bleeding. She had already received eight doses of 100 microgram misoprostol in an attempt to terminate her current nonviable pregnancy but without cervical ripening. Accompanying signs included dyspnea, cough, decreased urine output, lower extremity swelling, and a one-week history of abdominal distention. Her previous obstetric history includes abortion at 26 weeks gestation 11 years earlier due to severe preeclampsia, and has no previous cesarean section.

Upon arrival, the patient appeared acutely ill, exhibiting facial puffiness and respiratory distress. Her vital signs included blood pressure of 180/120 mmHg, pulse rate of 132 beats/min, respiratory

rate of 52 breaths/min, and oxygen saturation of 65% on room air. She had pink conjunctiva, non-icteric sclera, and decreased air entry with dullness to percussion in both lower lung fields. Her abdomen was distended, making uterine palpation difficult due to obesity and ascites, with estimated uterine size not exceeding 24 weeks. Per-vaginal examination revealed an uneffeced posterior cervix. Urine output was scant and bloody in the catheter bag. She had a high blood pressure record of 240/120mmHg at times and managed accordingly with hydralazine.

With the assessment of preeclampsia with severe features, preterm, complicated with pulmonary edema, pleural effusion, and ascites, HELLP syndrome with severe thrombocytopenia, she was fully investigated. Results showed that hemoglobin was 13.4g/dl, platelets: 74, urine was +3 for albumin, ALT: 138, AST: 156, BUN: 40, and Cr: 2.1.

Termination of pregnancy was decided after a panel discussion among senior obstetricians and gynecologists, but how to terminate was a debate. Finally, termination by cesarean section was deferred as this may predispose her to different complications, such as the classical scar and further giving misoprostol and prolongation of the pregnancy, and risk her to other severe preeclampsia complications.

She was started on oxygen, MgSO4 loading and maintenance, Lasix, Amlodipine, and hydralazine. A trial of mechanical dilatation with a uterine catheter was decided. Thus, a Foley bladder catheter of 18 gauge was inserted intrauterine under bivalve speculum visualization of the cervix, and a 500ml fluid was used to pressurize the catheter. She was regularly followed, and 10mg oxytocin in 1000ml NS was also given with the mechanical dilator. After 3 hours, the 500ml pressure was changed to 1000ml, and on subsequent assessment, she started to have abdominal pain. After 2 hours, the intrauterine catheter was removed, and the cervix started to dilate. Labor started, and she delivered a 0.8kg fresh stillbirth. She had mild bleeding and was managed accordingly with blood, misoprostol, and IV fluids.

On subsequent management, she was continued with Lasix, amlodipine, heparin, and antibiotics. She stayed for 6 days in the hospital and was discharged without sequel with follow-up for her postpartum conditions and for her next pregnancy.

Discussion

The decision regarding the mode of pregnancy termination was challenging because cesarean section carried significant risks due to the patient's gestational age, severe thrombocytopenia, ascites, and obesity. On the other hand, vaginal delivery was also complicated by an unfavorable cervix and poor response to misoprostol. Therefore, the use of mechanical cervical ripening methods in combination with other induction techniques was considered an appropriate management option in this case.

The patient had several risk factors for severe preeclampsia, including a history of previous severe preterm preeclampsia, obesity, and pregnancy after a prolonged interval. She had not received prophylactic therapy during the current pregnancy. Consequently, counseling regarding future pregnancies was important because she had experienced severe preterm preeclampsia twice, placing her at high risk for recurrence with potential maternal morbidity and mortality. Mechanical methods for cervical dilation are well established, although reported success rates vary across studies. Randomized trials have shown that balloon catheters are as effective as prostaglandins for cervical ripening while offering a better safety profile, particularly with lower rates of uterine tachysystole, although insertion may cause discomfort [13,14].

In this case, traction was applied to the intrauterine catheter using a one-liter intravenous fluid bag to facilitate cervical dilation. Similar approaches have been described in the literature, including taping the catheter to the patient's thigh under tension or attaching a weighted fluid bag to promote spontaneous expulsion [6,7]. Although weighted traction may shorten the time to catheter expulsion, studies have not consistently demonstrated improved cervical ripening or reduced delivery time [6,7]. The catheter may remain in place until spontaneous expulsion or for up to 12 hours, as reported in previous studies and observed in our patient [8].

Sequential and combination approaches using mechanical methods with pharmacologic agents have also been explored. In our patient, cervical ripening with a mechanical method followed by oxytocin infusion resulted in successful vaginal delivery. Similarly, previous studies have shown that oxytocin initiated concurrently with balloon catheter placement may increase delivery rates within 24 hours [15]. Nevertheless, randomized trials have reported no clear additional benefit of combining balloon catheters with oxytocin compared with catheter use alone [16,17].

Meta-analyses have suggested that combining balloon catheters with prostaglandins may accelerate cervical ripening compared with either method alone [16,18]. Other mechanical options, such as hygroscopic dilators including laminaria and Dilapan-S, are also considered safe and effective for cervical dilation, particularly in second-trimester pregnancy termination, although these were unavailable in our setting [19]. Evidence supports adequate cervical preparation before dilation and evacuation (D&E) at 20–24 weeks' gestation, with osmotic dilators often recommended for at least one day prior to the procedure [20].

Foley catheter placement through the internal cervical os with downward traction is a commonly used mechanical ripening technique. Studies comparing Foley catheters with prostaglandins have demonstrated similar cesarean delivery rates but lower rates of uterine tachysystole with mechanical methods [6,7]. These methods are particularly useful in women with an unfavorable cervix and can be used in cases of intact or ruptured membranes without increasing maternal or fetal infection risk.

Conclusion

Not only misoprostol, but mechanical methods have also been successful for the termination of pregnancy. Mechanical methods are used as an alternative option for cervical ripening in an uneffeced cervix in cases where the other methods are contraindicated or in sequence to the other methods.

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