SPONTANEOUS VAGINAL DELIVERY THROUGH A POSTERIOR BUCKET-HANDLE CERVICAL TEAR WITHOUT CERVICAL OS DILATATION – A CASE REPORT

SPONTANI VAGINALNI POROĐAJ KROZ ZADNJU CEVIKALNU RUPTURU PO TIPU „DRŠKA KOFE“ BEZ DILATACIJE SPOLJAŠNJEG MATERIČNOG UŠĆA – PRIKAZ SLUČAJA

Dragan STAJIĆ[1,2], Marija KUPREŠANIN[1], Jovana RODIĆ[1], Marko ILINČIĆ[1,2] and Sanja BULATOVIĆ[1]

ORCID NUMBER
Dragan Stajić – 0009-0002-1387-6338
Marija Kuprešanin – 0009-0003-3261-6467
Jovana Rodić – 0009-0006-0669-771X
Marko Ilinčić – 0000-0002-3404-7865
Sanja Bulatović – 0009-0002-9796-5855

University Clinical Center of Vojvodina, Novi Sad
Clinic of Gynecology and Obstetrics[1]
University of Novi Sad, Faculty of Medicine Novi Sad[2]

Case report
Prikaz slučaja
UDK 618.5:618.146-001
https://doi.org/10.2298/MPNS2502052S

Abstract
Introduction. Cervical tears represent a significant cause of postpartum hemorrhage and maternal morbidity, particularly at term. Among these, bucket-handle cervical tears – characterized by a circumferential laceration of the anterior or posterior cervical lip resembling a bucket handle – are extremely rare. This case highlights the clinical presentation, management, and outcome of such an injury. **Case Report.** A 29-year-old Serbian primiparous woman at 40 weeks of gestation was admitted for fetal monitoring following detection of bradycardia during contractions. She had no history of cervical procedures. Artificial rupture of membranes was performed upon admission, triggering strong uterine contractions and leading to spontaneous vaginal delivery of a healthy male neonate within four hours. No cervical prostaglandins were used, and oxytocin was administered for only five minutes prior to fetal expulsion. Postpartum examination revealed a posterior bucket-handle cervical tear, which served as the point of fetal exit and was the source of significant hemorrhage. No injuries to the uterine body or signs of hemoperitoneum were observed. The cervical tear was surgically repaired. The patient experienced a drop in hemoglobin and was treated with iron supplementation. Follow-up examinations confirmed normal healing of the cervix and vaginal tissues. **Conclusion.** This case underscores the importance of considering cervical tears as a potential complication, even in the absence of traditional risk factors. Appropriate management includes intrapartum monitoring, surgical repair when indicated, and consideration of elective cesarean delivery and cervical length surveillance in future pregnancies. Standardized protocols for diagnosis and management are essential to improve maternal outcomes and inform future obstetric care.
Key words: Cervix Uteri; Rupture; Lacerations; Delivery, Obstetric; Postpartum Hemorrhage; Surgical Procedures, Operative; Risk Factors

Sažetak
Uvod. Rupture grlića materice predstavljaju značajan rizik za postpartalno krvarenje i morbiditet majke, naročito u terminskim trudnoćama. Ruptura grlića u obliku „drške kofe“ – retka laceracija prednje ili zadnje usne grlića koja podseća na polukružnu dršku – predstavlja najređi oblik ove povrede. Prikazani slučaj ilustruje ovako izraženu povredu. **Prikaz slučaja.** Pacijentkinja, 29 godina starosti, primipara, u 40. gestacijskoj nedelji, hospitalizovana je zbog fetalne bradikardije tokom kontrakcija. Anamneza je bila bez prethodnih cervikalnih intervencija. Po prijemu je sprovedena veštačka ruptura plodovih ovojaka – amniotomija, što je indukovalo jake kontrakcije i rezultovalo vaginalnim porođajem zdravog muškog novorođenčeta u roku od četiri sata. Cervikalna primena prostaglandina nije bila indicirana, a oksitocinska infuzija trajala je svega pet minuta pre ekspulzije ploda. U postpartalnom periodu dijagnostikovana je zadnja ruptura grlića materice u obliku „drške kofe“, koja je predstavljala izlaznu putanju za fetus i uzrokovala obilno krvarenje. Nisu uočene lezije uterinog korpusa niti znaci hemoperitoneuma. Hirurška revizija i sanacija su sprovedene uspešno. Registrovan je pad nivoa hemoglobina, te je ordinirana peroralna suplementacija gvožđem. Na postpartalnoj kontroli zabeležen je uredan lokalni oporavak. **Zaključak.** Ovaj prikaz ističe složenost i potencijalne komplikacije cervikalnih ruptura, čak i bez predisponirajućih faktora. U budućim graviditetima preporučuju se pažljivo intrapartalno praćenje, razmatranje elektivnog carskog reza i serijsko transvaginalno merenje dužine cerviksa. Standardizacija protokola za dijagnostiku i lečenje ovih povreda od suštinskog je značaja za optimizaciju maternalnih ishoda.
Ključne reči: grlić materice; rupture; laceracije; porođaj; postpartalno krvarenje; operativne hirurške procedure; faktori rizika

Introduction

Cervical tears are a known cause of postpartum hemorrhage and can result in serious maternal complications, including mortality, if not promptly diagnosed and managed [1]. Documented types of cervical trauma during childbirth include lateral tears, bucket-handle tears, and annular detachment of the cervix [2]. These injuries are more frequently observed in term deliveries and are often associated with risk factors such as cervical cerclage, labor induction, maternal youth, assisted vaginal delivery, prostaglandin use, a scarred cervix, and precipitous labor. Among these, a bucket-handle tear – characterized by

Corresponding author: Jovana Rodić, E-mail: 965jovana@gmail.com, dragan.stajic@mf.uns.ac.rs

Abbreviations

CTG	– cardiotocography
CD&C	– cervical dilatation and curettage
ARM	– artificial rupture of the membranes

a circumferential laceration of either the anterior or posterior cervical lip that forms a bridge-like structure resembling a bucket handle - is particularly uncommon [3,4]. We present a rare case of spontaneous vaginal delivery through a posterior bucket-handle cervical tear in the absence of identifiable risk factors. To the best of our knowledge, this specific presentation has not previously been reported in literature.

Case Report

A 29-year-old primiparous Serbian woman, gravida 2 para 1, at 40 weeks' gestation, was admitted for continuous fatal monitoring due to recurrent fetal bradycardia (heart rate as low as 100 bpm) during prolonged uterine contractions. Her obstetric history included one previous uncomplicated full-term vaginal delivery. She had no history of cervical surgical procedures (e.g., loop excision, conization, curettage, or dilatation of the cervix) that could cause fibrotic changes or stenosis of the cervical canal. Routine speculum and digital examinations during the pregnancy were normal. Her medical and surgical was unremarkable, and the pregnancy had progression without complications under regular parental care. At admission, the cervix was effaced and dilated to 1 cm with cephalic presentation and intact amniotic sac. No cervical prostaglandins were employed in the procedure. The patient received a 5% glucose solution intravenously. No enema or additional induction measures were applied. One hour later, artificial rupture of membranes (ARM) was performed, with clear amniotic fluid noted. Despite more frequent contractions, cervical dilation remained minimal two hours later. Analgesia and intravenous fluids were administered. Approximately 3.5 hours after admission, the patient experienced a strong urge to push. Digital examination suggested full cervical dilatation with the fetal head at station +2. An oxytocin infusion (0.9% NaCl 500 ml with 5 IU oxytocin, at 30 ml/min) was administered for five minutes, resulting in the spontaneous vaginal birth of a healthy male neonate weighing 3800 g and measuring 52 cm. Apgar scores were 9 and 10 at 1 and 5 minutes, respectively. Following placental expulsion – during which macroscopic placental defects were observed – a manual uterine revision was performed. Examination below the vaginal retractors revealed that the anatomical cervical os remained only 1 cm dilated **(Figure 1)**. Simultaneously, a bleeding posterior cervical tear extending from 3 to 8 o'clock was discovered. This tear, resembling a bucket-handle lesion, had served as the passage through which the fetus was delivered **(Figure 2)**. The vaginal fornices were intact, and the tear did not extend into them. The possibility of a substantial uterine corpus lesion was dismissed upon recognizing the tear boundaries. The absence of hemoperitoneum was confirmed both clinically and by transabdominal ultrasound, which showed no free fluid. The patient was transferred to the operating room for surgical repair. Hemostasis was achieved using a combination of simple interrupted and figure-of-eight sutures (Polysorb® 2, Covidien, Medtronic, USA). Intraoperative management included administration of uterotonics (synthetic oxytocin, methylergonovine maleate, and carboprost tromethamine) and prophylactic antibiotics (cefazolin and metronidazole). Total estimated blood loss was 700 ml, with a drop in hemo-

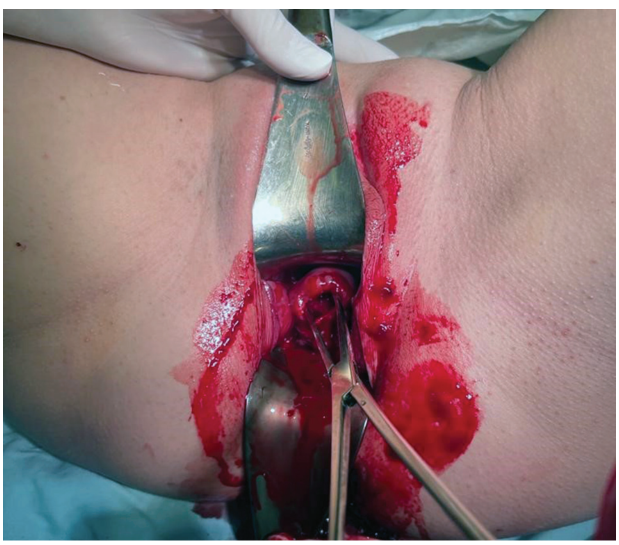

Figure 1. Dilatation of external cervical os after delivery

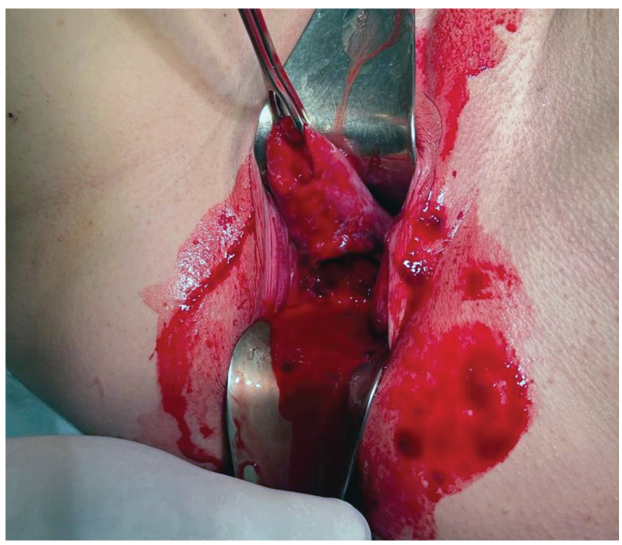

Figure 2. Bucket-handle cervical posterior lip tear after delivery

globin from 114 g/L to 99 g/L, managed conservatively with iron supplementation. The patient was monitored in the intensive care unit for 24 hours and discharged on the third postpartum day. At the three-week follow-up, vaginal and cervical healing were progressing normally.

Discussion

Clinically significant cervical lacerations are reported in approximately 0.2-1.7% of vaginal deliveries. Although uncommon, they are important causes of postpartum hemorrhage [4]. Among various risk factors, cervical tears are most commonly associated with labor induction – particularly the use of intravaginal prostaglandins – and operative vaginal deliveries. The growing global trend toward labor induction in recent years has further highlighted this concern [5]. While prostaglandins facilitate cervical ripening and fatal passage, their use has also been associated with an increased risk of uterine rupture in women with a history of uterine surgery [6]. Quraishi et al. described a series of bucket-handle cervical tears following labor induction with prostaglandins, identifying key contributing factors [7]. Operative vaginal deliveries using vacuum or forceps have long been associated with higher rates of soft tissue injury, including cervical lacerations. Additionally, cervical fibrosis from prior trauma or procedures – such as loop excision, cerclage, or curettage – can predispose to intrapartum cervical tears during labor [8]. In a study of 251 women with previous cervical cerclage, the incidence of intrapartum cervical lacerations during labor was 14%, significantly higher than the 2% observed in the control group [9]. Djokovic et al. reported that prior cervical dilation and curettage (CD&C), often performed for pregnancy termination, may result in subclinical cervical injury. While the most patients with a history of CD&C have uneventful future deliveries, this procedure has been linked to an increased risk of postpartum hemorrhage [10]. In the present case, none of the commonly reported risk factors were identified. The patient had no history of cervical procedures, labor induction agents (prostaglandins or oxytocin), or assisted delivery. Interestingly, Neri et al. proposed that digital cervical examination – frequently used to assess labor progress – may pose a risk, particularly in edematous cervices, possibly leading to trauma and tears such as the bucket-handle type. However, our patient underwent only three digital cervical exams over a four-hour course, making this an unlikely cause. Precipitate labor remains the only possible contributing factor in our case. It is characterized by rapid cervical dilation and fetal descent and has been linked to cervical lacerations in previous studies [11]. Several pathophysiological mechanisms for intrapartum bucket-handle and other cervical tears have been proposed. These include strong uterine contractions (spontaneous or induction-enhanced), premature bearing down against and incompletely dilated cervix, and sustained pressure by the fetal presenting part, which may compromise local blood circulation, leading to cervical edema, necrosis, and eventual avulsion. In posterior bucket-handle tears, as seen here, tone theory suggests that anterior displacement of the cervix during labor causes excessive pressure on the posterior cervical lip, resulting in tear [12]. Fibrotic changes may alter the distribution of pressure, resulting in unbalanced pressure on either the anterior or posterior cervical lip. Another proposed mechanism involves cervical edema and necrosis due to compression between the vertex and the pubic symphysis. However, relative prominence of posterior over anterior tears remains incompletely understood [13]. Because of their rarity, there is no standardized approach to repairing bucket-handle cervical tears. Nonetheless, large tears, particularly those associated with hemorrhage, clearly require surgical repair. Tears extending beyond the internal os or involving the lower uterine segment should prompt laparotomy for proper visualization and managed. The choice of suture material is critical. It must provide sufficient tensile strength to resist uterine contractions while minimizing the risk of tissue injury. In our case, we used Polysorb® 2, a multifilament braided absorbable suture, which has been recommended in the literature [13]. The technique also matters. While some advocate for continuous or mattress sutures, we opted for a combination of simple interrupted or figure-of-eight interrupted sutures [8]. Additionally, cervical closure with the suture should be monitored carefully considering its position and potential access difficulties. Some authors recommend using tools like a swab-on-a-stick or sigmoidoscope to avoid patency, though we did not use any such devices in our case [13]. In rare cases, repair may not be feasible, requiring partial cervical amputation or even hysterectomy [14]. Fortunately, primary repair was possible in our patient, with successful healing confirmed on follow-up. The implications of cervical tears for future pregnancies remain uncertain. A large retrospective cohort study reported a 4.9% recurrence rate of cervical lacerations compared to 0.1% in controls, along with an increased incidence of cervical insufficiency (1.9% vs. 0.3%) and potentially higher rates of spontaneous miscarriage [15, 16]. Although some women with prior cervical avulsion or partial cervical excision have subsequently had term deliveries, others have experienced preterm birth or miscarriage. To mitigate risk, some obstetricians opt for elective cesarean delivery in future pregnancies [8, 11]. Currently, there is no evidence-based guideline on the use of cervical cerclage following a bucket-handle tear. However, serial transvaginal cervical length measurement during pregnancy, combined with clinical judgment regarding cerclage or planned cesarean section, may help reduce recurrence risk [12]. Importantly, characteristics and changes in the cervix during labor should be closely monitored. Rigid persistence of the external cervical os may justify early cesarean section delivery to prevent trauma [14].

Conclusion

This report presents a rare case of spontaneous vaginal delivery through a posterior bucket-handle cervical tear, without dilation of the external cervical os. Prompt surgical management was successful, and the patient recovered well. Cervical lacerations – though rare – can lead to serious maternal morbidity and should be carefully considered as there are, currently, no standardized protocols for managing such injuries or guiding care in future pregnancies. We recommend comprehensive clinical evaluation of the cervical integrity at delivery, along with serial prenatal ultrasound transvaginal cervical length surveillance in future pregnancies. Elective cerclage and cesarean delivery may be considered in select cases. Although rare, bucket-handle cervical tear should be carefully considered in patients undergoing labor induction, operative delivery, having a history of previous cervical trauma such as loop excision, cervical dilatation, and curettage or cerclage, or experiencing precipitate labor.

References

1. Biehl DR. Antepartum and postpartum hemorrhage. In: Shnider SM, Levinson C, editors. Anesthesia for obstetrics. 2nd ed. Baltimore: Williams & Wilkins; 1987. p. 385-94.

2. Parikh R, Brotzman S, Anasti JN. Cervical laceration: some surprising facts. Am J Obstet Gynecol. 2007;196(5):e17-8.

3. Melamed N, Ben-Haroush A, Chen R, Kaplan B, Yogev Y. Intrapartum cervical lacerations: characteristics, risk factors, and effect on subsequent pregnancies. Am J Obstet Gynecol. 2009;200(4):388.e1-4.

4. Landy HJ, Laughon SK, Bailit JL, Kominiarek MA, Gonzalez-Quintero VH, Ramirez M. Characteristics associated with severe perineal and cervical lacerations during vaginal delivery. Obstet Gynecol. 2011;117(3):627-35.

5. Marconi AM. Recent advances in the induction of labor. F1000Res. 2019;8:F1000.

6. Grotegut CA, Moore NL, Reddick KL, Canzoneri BJ, Boyd BK, Brown HL. Cervicovaginal fistula presenting during miscarriage. Ultrasound Obstet Gynecol. 2010;36(1):112-4.

7. Quraishi S, Gifty D, Roj A, Rathore S, Beena K. Cervical lacerations: a case series. Indian Journal of Obstetrics and Gynecology Research. 2023;10(4):508-10.

8. Hulin C, Lang B, Stanley J, Davidson C. Occult cervical avulsion: a rare case of intrapartum vaginal bleeding. Case Rep Obstet Gynecol. 2019;2019:7356150.

Rad je primljen 14 IV 2025.
Recenziran 19. VI 2025.
Prihvaćen za štampu 19. VI 2025.
BIBLID.0025-8105:(2025):LXXVIII:1-2:52-55.

9. Harger JH. Comparison of success and morbidity in cervical cerclage procedures. Obstet Gynecol. 1980;56(5):543-8.

10. Djokovic D, Costa C, Martins A, Abushad S. Spontaneous delivery through a cervical tear without cervical os dilatation. Clin Case Rep. 2015;3(1):3-6.

11. Neri A, Ovadia Y, Schoenfeld A, Nitke S. Detachment of posterior uterine cervical lip associated with spontaneous delivery. Eur J Obstet Gynecol Reprod Biol. 1982;13(5):291-2.

12. Mayne L, Sudhahar A, Veerasingham M. Partial annular cervical tear: a case report. Case Rep Womens Health. 2021;31: e00320.

13. Newnham-Hill A, Odendaal J, Hillman C. An intrapartum cervical buttonhole tear: a case report and review of rare tear pathogenesis. Case Rep Womens Health. 2023;38:e00516.

14. Fessehaye A, Asfaw M, Kitila HH, Gudu W. Bucket-handle cervical tear at term following oxytocin-induced vaginal delivery: a case report. J Med Case Rep. 2022;16(1):79.

15. Hamou B, Sheiner E, Coreanu T, Walfisch A, Silberstein T. Intrapartum cervical lacerations and their impact on future pregnancy outcome. J Matern Fetal Neonatal Med. 2020;33 (5):883-7.

16. Rodić J, Vejnović A, Đurica S, Rodić D, Perović D, Mladenović-Segedi L. Childbirth in adolescents-features and outcomes. Med Pregl. 2024;77(1-2):44-8.