

Persistent Postpartum Urinary Retention: A Case Report and Review of Literature

Dimitris Baroutis¹, Rafail Mantziros¹, Michael Sindos¹, Alexandros Psarris¹, George Daskalakis¹

Review began 03/14/2024

Review ended 03/30/2024

Published 04/10/2024

© Copyright 2024

Baroutis et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

1. 1st Department of Obstetrics and Gynecology, Alexandra Hospital, National and Kapodistrian University of Athens, Athens, GRC

Corresponding author: Dimitris Baroutis, dbaroutis@gmail.com

Abstract

This case report describes persistent urinary retention lasting over 30 days postpartum in a 23-year-old primiparous female after an otherwise uncomplicated vaginal delivery at 37 weeks gestation. Notable risk factors present included epidural anesthesia, episiotomy, third-degree perineal laceration, and inability to void spontaneously before leaving the delivery room. Despite initial catheterization draining a large volume, the patient experienced recurrent failed voiding trials requiring ongoing intermittent catheterization during her admission. One month after delivery, voiding trials were finally successful, and she regained normal spontaneous voiding without catheterization. This case highlights persistent postpartum urinary retention (PUR) as an uncommon but potentially serious obstetric complication requiring prompt diagnosis and appropriate management to prevent adverse events and optimize outcomes. Although most cases are self-limited, a high index of suspicion is needed to institute timely treatment with intermittent catheterization given the morbidity associated with sustained bladder overdistension postpartum.

Categories: Anesthesiology, Obstetrics/Gynecology, Urology

Keywords: epidural anesthesia, pudendal nerve, intermittent catheterization, voiding dysfunction, postpartum urinary retention

Introduction

Postpartum urinary retention (PUR) is a concerning complication that can occur after childbirth, yet there is a lack of consensus on the precise definition and diagnostic criteria for this condition. While some authors define PUR as the inability to void spontaneously within six hours of delivery or after catheter removal, referred to as overt PUR, others argue that increased post-void residual urine volume (PVR) after spontaneous micturition, known as covert PUR, should also be considered as evidence of impaired bladder emptying [1-3]. The appropriate cutoff for abnormal PVR is controversial, with emerging evidence suggesting 500 mL rather than the traditional 150 mL may be a more meaningful indicator of impaired voiding [2,3]. Reported incidence rates for PUR vary widely from 0.05% to 45%, likely reflecting this discordance in definitions [4]. In some cases, PUR persists beyond the initial postpartum period, with retention continuing for days or even weeks after delivery [5]. The underlying pathophysiology of PUR involves a complex interplay of anatomical, neurological, and hormonal factors that can impair detrusor contractility and urinary sensation in the postpartum period. Resultant bladder overdistension and large PVR volumes further inhibit spontaneous voiding through maladaptive neural reflexes. If unresolved, PUR can lead to serious complications including urinary tract infection, bladder damage, and renal impairment [6]. Despite the significant morbidity associated with PUR, this condition often goes unrecognized and undertreated due to the lack of consensus on diagnostic criteria and management protocols.

In this report, we present a case of persistent PUR continuing weeks after delivery and review the current literature regarding the definition, diagnosis, incidence, predisposing factors, and management of PUR. This case highlights the importance of increased awareness and evidence-based recommendations for this frequent yet poorly understood postpartum complication. A thorough assessment of voiding function and early intervention when impaired bladder emptying is detected are crucial to prevent short- and long-term sequelae of sustained PUR.

Case Presentation

A 23-year-old primiparous female at 37+2 weeks gestation presented with contractions. Her history included a cervical cerclage at 19 weeks for shortening and sickle cell trait. As the intensity of contractions increased, she was transferred to labor and delivery, the cerclage was removed, and a microbiological culture was obtained. Early epidural anesthesia was administered at 3 cm dilation using ropivacaine/fentanyl at L3-L4. Four hours later, she delivered a healthy 2,880 g boy spontaneously, with median episiotomy, due to head expulsion difficulty, and 3a perineal laceration repair. The epidural was discontinued 30 minutes after delivery.

Catheter removal on day 1 was followed by reinsertion for failed spontaneous voiding despite mobilization and analgesia. Testing was normal. The catheter was removed again after 24 hours. The patient initially

How to cite this article

Baroutis D, Mantziros R, Sindos M, et al. (April 10, 2024) Persistent Postpartum Urinary Retention: A Case Report and Review of Literature. *Cureus* 16(4): e57956. DOI 10.7759/cureus.57956

reported voiding then presented with oliguria and pain. Abdominal examination revealed a palpable mass in front of the uterus. Immediate catheterization drained 450 mL and gradually 2,000 mL in total, relieving her pain. Recurrent retention followed repeated removal attempts, prompting neurological examination and lower spine magnetic resonance imaging (MRI) showing no abnormalities. Vitamin B12 and folate were normal. After a urogynecology consultation, she was discharged with an indwelling catheter, and a urodynamic follow-up was scheduled.

She returned on day 23 postpartum with suprapubic pain and a positive urine culture. Antibiotics were initiated per sensitivity results after the catheter was changed. After normal urodynamics and minimal residual volume, the catheter was removed on day 34, and she was discharged without medications. One month post-discharge, she remained asymptomatic, suggesting resolving postpartum urinary retention.

The timeline of events is shown in Table 1.

| Postpartum day | Events |
|----------------|---|
| Delivery | 37+2 weeks gestation, spontaneous vaginal delivery with epidural anesthesia, median episiotomy, third-degree perineal laceration repair |
| Day 1 | Failed spontaneous voiding, insertion of transurethral catheter |
| Day 2 | Removal of catheter, failed voiding trial, reinsertion of transurethral catheter |
| Day 3 | Catheter removal, patient reported voiding, developed oliguria, abdominal pain and palpable bladder, insertion of transurethral catheter, drained 2,000 mL of urine |
| Day 4-33 | Multiple failed voiding trials after catheter removal, indwelling transurethral catheterization |
| Day 33 | Suprapubic pain and catheter change, positive urine culture, treatment with antibiotics per sensitivity, catheter changed |
| Day 34 | Normal urodynamic testing, minimal post-void residual, catheter removed, discharged home |
| Day 58 | 1 month follow-up, normal voiding restored |

TABLE 1: Timeline of key events in the clinical course

Discussion

Persistent postpartum urinary retention (PUR) is a rare occurrence, with reported incidence ranging from 0.05% to 0.18% [5,6]. Timely diagnosis and management are crucial to prevent complications such as detrusor muscle and nerve damage, bladder rupture, and kidney failure [2-4,7].

The proposed pathogenesis of PUR includes pudendal nerve injury during childbirth, leading to prolonged terminal motor latencies persisting for months postpartum [8-10]. Recent data not only confirm these factors but also highlight additional contributors to PUR, including the absence of spontaneous voiding before leaving the delivery room, vulvar edema or perineal hematoma, birth weight > 3.5 kg, a longer duration of the second stage of labor, and second-degree or greater perineal laceration [2-4,11]. Specifically, epidural analgesia, prolonged second stage of labor, and instrumental delivery appear notably associated with persistent postpartum urinary retention [5,6].

In our case, various predisposing risk factors were identified. The patient, a primigravida, received epidural analgesia, underwent an episiotomy, and suffered a third-degree perineal tear. Unfortunately, she was unable to void spontaneously before leaving the delivery room, and as a consequence, the urinary catheter was not removed until the next day. Attempts were made to encourage voiding, including the use of oral analgesics, mobilization, and patient privacy, but without success. Afterward, a transurethral catheter was inserted and left in place for 24 hours; however, the patient declined the recommended approach of clean intermittent self-catheterization (CISC), as proposed due to its shorter median duration of catheterization compared to the indwelling one [12,13].

Our patient's predisposing factors align with established risk factors for persistent postpartum urinary retention, as outlined in Table 2.

| Risk factors from the literature | Patient's characteristics |
|---|---|
| Primiparity [1] | Primiparous |
| Epidural analgesia [1,5,6] | Received epidural analgesia |
| Instrumental delivery [1,5,6] | Spontaneous vaginal delivery |
| Episiotomy [1] | Received episiotomy |
| Failed voiding before leaving the delivery room [2,4] | Unable to void before leaving the delivery room |
| Birth weight > 3.5 kg [2,4] | Birth weight = 2.88 kg |
| Prolonged second stage [2,4] | Duration of the second stage = 30 minutes approximately |
| Second-degree or greater laceration [2,4,11] | Third-degree perineal laceration |

TABLE 2: Risk factors for persistent postpartum urinary retention

Rarely, long-term dysfunction occurs, involving mechanical obstruction from hematoma/edema or bladder descent, as well as functional impairment from birth-related pelvic floor pain, urethral overactivity, and reduced bladder filling awareness. Detrusor underactivity from nerve damage or neglected overdistension may also occur, along with atony from increased postpartum progesterone [3,4,6].

The approach to treating evident PUR involves intermittent catheterization, as pharmacological therapies are ineffective. Catheterization is recommended for a palpable bladder and difficulty voiding or oliguria. There is no established protocol; four to six hourly catheterization or as needed when the urge to void occurs is typical. With small spontaneous volumes, self-catheterization to assess residual volume is instructed. Discontinuation is considered when the residual volume is <150 mL and significant voiding difficulty resolves, based on empirical observations lacking evidence-based standards [14,15]. Routine antibiotic prophylaxis is deemed unnecessary [16].

PUR typically follows a self-limiting course, resolving in about one week [14,17]. In covert PUR, 96%-100% normalize residual volumes within 2-5 days [14,18].

Conclusions

In summary, this case illustrates persistent postpartum urinary retention as an uncommon but serious complication after vaginal delivery. Risk factors such as primiparity, epidural use, episiotomy, and perineal lacerations likely contributed. Prompt diagnosis and intermittent catheterization prevented adverse events. The self-limited natural history involves resolution within 1-2 weeks postpartum, likely due to transient pudendal nerve impairment improving detrusor contractility. Increased awareness of persistent PUR is important to minimize morbidity through timely treatment. Avoiding unnecessary interventions such as episiotomy and judicious epidural use may reduce incidence. Excellent outcomes can be achieved with proper diagnosis and management.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Dimitris Baroutis, Rafail Mantzioros, Michael Sindos, Alexandros Psarris, George Daskalakis

Acquisition, analysis, or interpretation of data: Dimitris Baroutis, Rafail Mantzioros

Drafting of the manuscript: Dimitris Baroutis, Rafail Mantzioros, Michael Sindos, Alexandros Psarris, George Daskalakis

Critical review of the manuscript for important intellectual content: Dimitris Baroutis, Rafail Mantzioros, Michael Sindos, Alexandros Psarris, George Daskalakis

Supervision: Michael Sindos, Alexandros Psarris, George Daskalakis

Disclosures

Human subjects: Consent was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Acknowledgements

Dimitris Baroutis and Rafail Mantziros contributed equally to the work and should be considered co-first authors.

References

- Mulder FE, Schoffemeer MA, Hakvoort RA, Limpens J, Mol BW, van der Post JA, Roovers JP: Risk factors for postpartum urinary retention: a systematic review and meta-analysis. *BJOG*. 2012, 119:1440-6. [10.1111/j.1471-0528.2012.03459.x](https://doi.org/10.1111/j.1471-0528.2012.03459.x)
- Ain QU, Shetty N, K S: Postpartum urinary retention and its associated obstetric risk factors among women undergoing vaginal delivery in tertiary care hospital. *J Gynecol Obstet Hum Reprod*. 2021, 50:101837. [10.1016/j.jogoh.2020.101837](https://doi.org/10.1016/j.jogoh.2020.101837)
- Mulder FE, Hakvoort RA, de Bruin JP, Janszen EW, van der Post JA, Roovers JW: Long-term micturition problems of asymptomatic postpartum urinary retention: a prospective case-control study. *Int Urogynecol J*. 2018, 29:481-8. [10.1007/s00192-017-3457-6](https://doi.org/10.1007/s00192-017-3457-6)
- Nutaitis AC, Meckes NA, Madsen AM, et al.: Postpartum urinary retention: an expert review. *Am J Obstet Gynecol*. 2023, 228:14-21. [10.1016/j.ajog.2022.07.060](https://doi.org/10.1016/j.ajog.2022.07.060)
- Groutz A, Gordon D, Wolman I, Jaffa A, Kupferminc MJ, Lessing JB: Persistent postpartum urinary retention in contemporary obstetric practice. Definition, prevalence and clinical implications. *J Reprod Med*. 2001, 46:44-8.
- Groutz A, Levin I, Gold R, Pauzner D, Lessing JB, Gordon D: Protracted postpartum urinary retention: the importance of early diagnosis and timely intervention. *Neurourol Urodyn*. 2011, 30:83-6. [10.1002/nau.20926](https://doi.org/10.1002/nau.20926)
- Gursoy AY, Kiseli M, Tangal S, et al.: Prolonged postpartum urinary retention: a case report and review of the literature. *S Afr J Obstet Gynaecol*. 2015, 21:48-9.
- Lee SJ, Park JW: Follow-up evaluation of the effect of vaginal delivery on the pelvic floor. *Dis Colon Rectum*. 2000, 43:1550-5. [10.1007/BF02236737](https://doi.org/10.1007/BF02236737)
- Tetzschner T, Sørensen M, Lose G, Christiansen J: Pudendal nerve recovery after a non-instrumented vaginal delivery. *Int Urogynecol J Pelvic Floor Dysfunct*. 1996, 7:102-4. [10.1007/BF01902582](https://doi.org/10.1007/BF01902582)
- Tetzschner T, Sørensen M, Lose G, Christiansen J: Pudendal nerve function during pregnancy and after delivery. *Int Urogynecol J Pelvic Floor Dysfunct*. 1997, 8:66-8. [10.1007/BF02764820](https://doi.org/10.1007/BF02764820)
- Lamblin G, Chene G, Aeberli C, Soare R, Moret S, Bouvet L, Doret-Dion M: Identification of risk factors for postpartum urinary retention following vaginal deliveries: a retrospective case-control study. *Eur J Obstet Gynecol Reprod Biol*. 2019, 243:7-11. [10.1016/j.ejogrb.2019.10.001](https://doi.org/10.1016/j.ejogrb.2019.10.001)
- Humburg J, Holzgreve W, Hoesli I: Prolonged postpartum urinary retention: the importance of asking the right questions at the right time. *Gynecol Obstet Invest*. 2007, 64:69-71. [10.1159/000099306](https://doi.org/10.1159/000099306)
- Mulder FE, Hakvoort RA, de Bruin JP, van der Post JA, Roovers JW: Comparison of clean intermittent and transurethral indwelling catheterization for the treatment of overt urinary retention after vaginal delivery: a multicentre randomized controlled clinical trial. *Int Urogynecol J*. 2018, 29:1281-7. [10.1007/s00192-017-3452-y](https://doi.org/10.1007/s00192-017-3452-y)
- Mulder FE, Hakvoort RA, Schoffemeer MA, Limpens J, Van der Post JA, Roovers JP: Postpartum urinary retention: a systematic review of adverse effects and management. *Int Urogynecol J*. 2014, 25:1605-12. [10.1007/s00192-014-2418-6](https://doi.org/10.1007/s00192-014-2418-6)
- Yip SK, Sahota D, Pang MW, Day L: Postpartum urinary retention. *Obstet Gynecol*. 2005, 106:602-6. [10.1097/01.AOG.0000171863.57303.01](https://doi.org/10.1097/01.AOG.0000171863.57303.01)
- Dieter AA, Amundsen CL, Edenfield AL, Kawasaki A, Levin PJ, Visco AG, Siddiqui NY: Oral antibiotics to prevent postoperative urinary tract infection: a randomized controlled trial. *Obstet Gynecol*. 2014, 123:96-103. [10.1097/AOG.0000000000000024](https://doi.org/10.1097/AOG.0000000000000024)
- Yip SK, Sahota D, Pang MW, Chang A: Postpartum urinary retention. *Acta Obstet Gynecol Scand*. 2004, 83:881-91. [10.1111/j.0001-6349.2004.00460.x](https://doi.org/10.1111/j.0001-6349.2004.00460.x)
- Yip SK, Brieger G, Hin LY, Chung T: Urinary retention in the post-partum period. The relationship between obstetric factors and the post-partum post-void residual bladder volume. *Acta Obstet Gynecol Scand*. 1997, 76:667-72. [10.3109/00016349709024608](https://doi.org/10.3109/00016349709024608)