NARRATIVE REVIEW

Anesthetic Approach to Placenta Previa with Associated Bladder Rupture: A Case Report

Made Bagus Cahya Maha Putra*, I Gusti Agung Gede Utara Hartawan, DA Mas Shintya Dewi

Department of Anaesthesiology and Intensive Care, Udayana University, Denpasar, Indonesia

DOI : 10.24843/nqk01d22

Abstract

This case report outlines the anesthetic management of total placenta previa with high-risk features of placenta accreta spectrum (PAS) complicated by bladder rupture, representing a rare but clinically significant form of invasive placentation. A 29-year-old G2P1001 at 35+3 weeks' gestation presented with recurrent antepartum bleeding and ultrasonographic features consistent with PAS, including grade III lacunae, bridging vessels, severe myometrial thinning, and a Placenta Accreta Index (PAI) score of 6. Spinal anesthesia was initiated for delivery, followed by a controlled conversion to general anesthesia to facilitate hysterectomy, two-layer bladder repair, ureteral reconstruction, and Double-J stent placement. Hemodynamic stability was maintained using tranexamic acid, colloid co-loading, invasive arterial monitoring, and norepinephrine titration. An estimated blood loss of 2,300 mL was managed with targeted transfusion, resulting in favorable maternal recovery and neonatal outcomes (Apgar 7 and 9). This case underscores the importance of early PAS recognition, structured anesthetic planning, and coordinated multidisciplinary care, supporting the benefit of a staged neuraxial-to-general anesthesia strategy in complex PAS with urologic involvement.

Keywords: Anesthetic management, Bladder rupture, Caesarean hysterectomy, Placenta Accreta spectrum, Placenta previa

Pendekatan Anestesi pada Kasus Plasenta Previa dengan Komplikasi Ruptur Buli: Laporan Kasus

Abstrak

Laporan kasus ini menjabarkan penatalaksanaan anestesi pada plasenta previa total dengan fitur risiko tinggi *placenta accreta spectrum* (PAS) yang disertai ruptur buli, sehingga menimbulkan tantangan maternal dan pembedahan yang signifikan. Seorang perempuan G2P1001 berusia 29 tahun dengan usia kehamilan 35+3 minggu datang dengan perdarahan antepartum berulang serta temuan ultrasonografi yang mengarah pada PAS, termasuk lakuna grade III, pembuluh darah *bridging*, penipisan miometrium yang berat, dan skor *Placenta Accreta Index* (PAI) sebesar 6. Anestesi spinal diberikan untuk proses persalinan, diikuti konversi terencana ke anestesi umum untuk memfasilitasi tindakan histerektomi, perbaikan buli dua lapis, rekonstruksi ureter, serta pemasangan stent Double-J. Stabilitas hemodinamik dipertahankan melalui pemberian asam traneksamat, *co-loading* koloid, pemantauan arteri invasif, dan titrasi norepinefrin. Perkiraan kehilangan darah sebesar 2.300 mL ditangani dengan transfusi terarah, dan luaran maternal maupun neonatal (Apgar 7 dan 9) menunjukkan hasil yang baik. Kasus ini menegaskan pentingnya deteksi dini PAS, perencanaan anestesi yang terstruktur, dan koordinasi multidisipliner, serta menyoroti manfaat pendekatan anestesi kombinasi neuraksial–umum pada kasus PAS kompleks dengan keterlibatan urologis.

Kata Kunci: Histerektomi sesarea, Manajemen anestesi, Plasenta previa, Ruptur buli, Spektrum plasenta akreta

Introduction

Placenta previa is characterized by abnormal implantation of placental tissue in the lower uterine segment and is classified as total placenta previa when the placenta completely covers the internal cervical os.[1] This condition carries considerable maternal and neonatal morbidity, particularly when occurring concurrently with PAS, which substantially increases surgical risk and complexity. The strongest risk factor for placenta previa is a prior cesarean delivery, and with rising global cesarean rates, its incidence has increased to approximately 1 in 200 pregnancies.[2]

When abnormal placentation invades adjacent organs such as the bladder, operative complexity and mortality risk rise significantly, with maternal mortality up to 9.5% and neonatal mortality up to 24%.[3] Given its life-threatening potential, placenta previa requires meticulous hemorrhage risk assessment and comprehensive anesthetic planning, including preoperative evaluation and intraoperative hemodynamic management.[1]

This case is notable due to the presence of total placenta previa with high-risk sonographic indicators of PAS, complicated by intraoperative bladder rupture that necessitated extensive urologic reconstruction. The combination of complex obstetric pathology, massive hemorrhage risk, and the need for a staged anesthetic strategy—from neuraxial anesthesia for delivery to planned conversion to general anesthesia—provides important insight into multidisciplinary perioperative management in high-acuity PAS cases.

Corresponding Author
dr. Made Bagus Cahya Maha Putra
Denpasar, Indonesia
bcmbius2024@gmail.com

Submitted: 14-Okt-2025 Revised: 23-Nov-2025
Accepted: 24-Nov-2025 Published: 01-Dec-2025

Case Presentation

A 29-year-old woman (G2P1001) at 35+3 weeks' gestation was admitted with total placenta previa and high suspicion of PAS (PAS 3, S2, Type 4), supported by grade III lacunae, bridging vessels, severe myometrial thinning (<1 mm), and a PAI score of 6.0. She had a history of recurrent vaginal bleeding since 27 weeks of gestation, including a significant episode shortly before admission. An ultrasound at 30 weeks had shown findings consistent with PAS, and elective readmission had been advised. She denied systemic symptoms, urinary or gastrointestinal complaints, and reported no allergies or significant medical history. Her surgical history included an uncomplicated cesarean section under regional anesthesia in 2022. She did not consume tobacco or alcohol.

On admission, she was hemodynamically stable with a pulse of 113 beats/min, blood pressure of 100/70 mmHg, respiratory rate of 18 breaths/min, and SpO_2 of 97% on room air. Physical examination showed a fundal height of approximately 28 cm and ongoing spotting, with normal fetal heart tones at 148 beats/min. Airway evaluation was unremarkable (Mallampati II). Laboratory tests revealed microcytic hypochromic anemia (Hb 8.8 g/dL, MCV 81.1 fL, MCH 24.9 pg, MCHC 30.7 g/dL), normal coagulation profile, preserved renal and liver function, and albumin 3.2 g/dL. Transabdominal ultrasound confirmed a live cephalic fetus and an anterior placenta completely covering the cervical os, with grade III lacunae, bridging vessels, and myometrial thickness <1 mm, consistent with high suspicion for PAS. The patient was classified as ASA physical status III.

In anticipation of massive hemorrhage, multidisciplinary preparation included two large-bore intravenous lines, arterial catheterization, blood product readiness, vasoactive agents, and equipment for controlled transition to general anesthesia. Spinal anesthesia with 10 mg of 0.5% hyperbaric bupivacaine was administered at L3–L4, with confirmed sensory block. She received oxygen via nasal cannula and prophylactic medications including tranexamic acid, paracetamol, ondansetron, and vitamin K. After delivery of the neonate, the anesthetic was converted to general anesthesia using intravenous lidocaine, fentanyl, propofol, and atracurium. Endotracheal intubation was successful, and anesthesia was maintained with sevoflurane

and intermittent atracurium. Norepinephrine was titrated to maintain a mean arterial pressure above 65 mmHg.

Estimated blood loss was 2,300 mL, managed with crystalloid, colloid, and 682 mL packed red cells. In addition to hysterectomy, intraoperative findings included bladder and ureteral injury requiring two-layer bladder repair, end-to-end ureteral anastomosis, left ureteral reimplantation, and placement of a double-J stent.

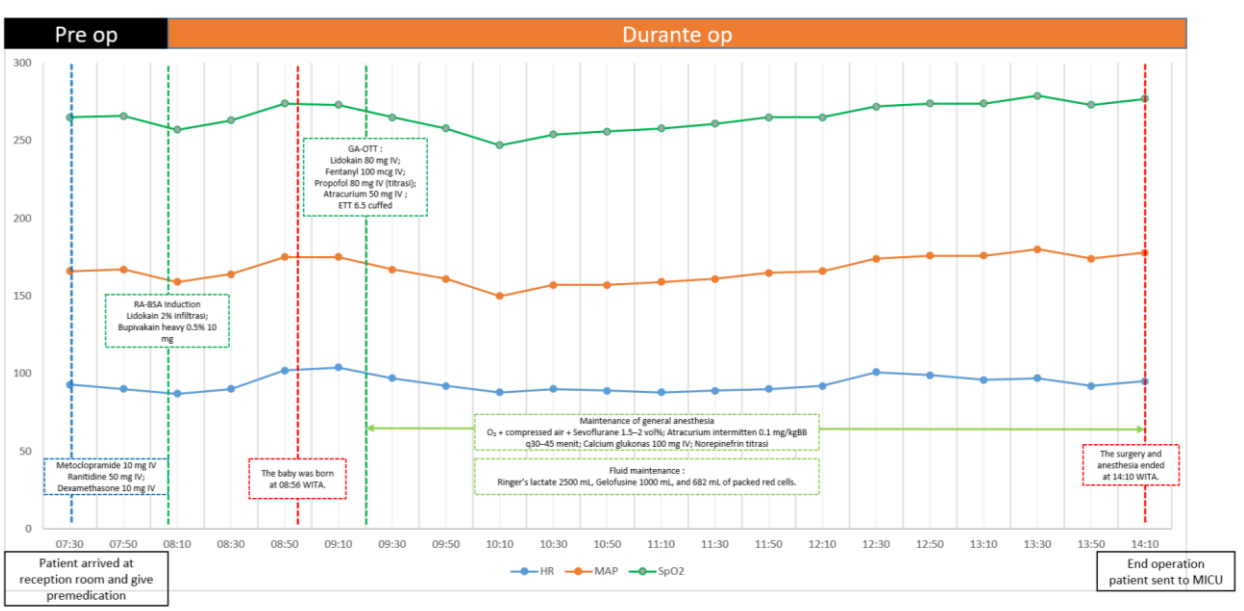

Figure 1. Haemodynamic profile preoperation and during operation

Postoperatively, the patient was managed in the maternal intensive care unit with multimodal analgesia consisting of a low-dose morphine–ketamine infusion and paracetamol. Her clinical condition improved progressively: she tolerated oral intake, achieved stable urine output, and ambulated independently by day 4, when the abdominal drain was removed. No adverse or unexpected complications occurred. She was discharged with a plan for follow-up 7–10 days later.

Discussion

Effective perioperative management is vital in placenta previa complicated by PAS, particularly when bladder invasion is suspected.[1] Advanced imaging such as MRI may better delineate placental invasion into the myometrium and adjacent organs.[4]

Anesthetic technique selection must be individualized, balancing hemorrhage risk, fetal exposure, airway management, and anticipated surgical complexity. Neuraxial anesthesia offers maternal awareness, minimal impact on uterine tone, reduced fetal exposure to systemic agents, and superior postoperative analgesia, though unplanned conversion to general anesthesia (GA) may be required. GA provides early airway control but is associated with increased risks of hemorrhage, difficult intubation, and fetal anesthetic exposure. A combined strategy—initiating with neuraxial anesthesia and transitioning to planned GA—may optimize both maternal and neonatal outcomes but involves the challenge of intraoperative intubation.[5,6] In high-risk abnormal placentation, anesthetic technique may influence hemodynamic stability.[4]

In this case, spinal anesthesia minimized fetal exposure, while planned conversion to general anesthesia optimized surgical access and hemodynamic control.[7] A controlled conversion to GA after delivery (propofol induction, atracurium neuromuscular blockade,

sevoflurane maintenance) enabled safe hysterectomy and urologic reconstruction.[8] This approach balanced neonatal benefits associated with neuraxial anesthesia with the airway control and hemodynamic precision of GA.[9] Although unplanned conversions carry risk of hemodynamic instability, GA alone in abnormal placentation also increases hypotension and vasopressor requirement.[5]

Adequate vascular access and invasive hemodynamic monitoring are essential to mitigate hemorrhage-related instability and support rapid transfusion.[10] Bladder invasion increases the risk for massive hemorrhage and reconstructive surgery, underscoring the need for blood availability and readiness to activate massive transfusion protocols.[7,9] In this case, pre-incision colloid co-loading and tranexamic acid were implemented. Blood loss was managed with targeted packed red cell transfusion.

Surgical management prioritized hemorrhage control via hysterectomy and restoration of urinary tract integrity through cystorrhaphy, ureteral anastomosis, and stent placement. Hemodynamic management during hemorrhage is crucial. Norepinephrine was titrated to maintain MAP >65 mmHg, and tranexamic acid served as part of multimodal hemorrhage control.[9] Continuous invasive monitoring and readiness for transfusion reduce the severity and duration of hypotension, helping prevent organ injury.[13] Intraoperatively, blood pressure was maintained with vasopressor support.

Postoperative intensive care facilitates early recognition and management of residual hemorrhage, anemia, fluid imbalance, or organ dysfunction.[10] Multimodal analgesia—morphine–ketamine infusion and paracetamol—offered adequate pain control while minimizing respiratory depression, reducing risk of pulmonary and infectious complications.[12,13] No postoperative infection or hemodynamic instability occurred.

Despite favorable outcome, opportunities for improvement include optimizing preoperative anemia, enhancing MRI access, strengthening massive transfusion readiness, and improving multidisciplinary preparedness. Preoperative anemia limited physiologic reserve; when feasible, optimizing hematologic status may reduce transfusion needs. Blood product availability and blood bank responsiveness remain important system-level determinants. Earlier access to MRI could refine preoperative mapping of placental invasion and improve urologic planning. Variability in outcomes among similar cases often reflects differences in institutional preparedness and multidisciplinary coordination. While uterine artery embolization or conservative measures may be considered in selected scenarios, bladder invasion with extensive PAS typically requires hysterectomy and urogenital reconstruction.[13,14]

This case illustrates that early recognition of PAS, structured anesthetic planning, and coordinated multidisciplinary care are essential for optimizing outcomes in placenta previa complicated by bladder rupture. A staged neuraxial-to-general anesthesia approach offers significant benefit in complex PAS requiring extensive urologic reconstruction.

Acknowledgement

Nil.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial Support and Sponsorship

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflicts of Interest

The authors report no conflict of interest.

Data Availability Statement

De-identified patient data from this case report will be made available upon reasonable request to the corresponding author following publication, subject to institutional data-sharing policies and ethics approval.

Author's Contributions

All authors contributed significantly to the conception and design of the study, data collection, analysis, and interpretation of the results. All authors participated in writing and critically revising the manuscript for important intellectual content, approved the final version to be published, and are accountable for all aspects of the research.

References

1. Anaesthetic Management of a Patient with Placenta Previa (PP) - A Case Study. Texila Int J Public Health [Internet]. 2024 Sept 30 [cited 2025 Nov 23];12(3). Available from: https://www.texilajournal.com/public-health/edition/189-volume12-issue3
2. Fan D, Rao J, Lin D, Zhang H, Zhou Z, Chen G, et al. Anesthetic management in cesarean delivery of women with placenta previa: a retrospective cohort study. BMC Anesthesiol. 2021 Dec;21(1):247.
3. Smith ZL, Sehgal SS, Van Arsdalen KN, Goldstein IS. Placenta Percreta With Invasion into the Urinary Bladder. Urol Case Rep. 2014 Jan;2(1):31–2.
4. Zhao H, Zhao X, Liu C, Tao Y, Zhou Y. Bladder Bleeding Due to Placenta Percreta: Report of Four Cases and Management Discussion. Matern-Fetal Med. 2021 Oct;3(4):285–91.
5. Jasinski T, Remesz A, Resko R, Budynko A, Majdylo K. Anesthetic Management for Patients with Placenta Accreta Spectrum: A Scoping Review. J Clin Med. 2025 July 4;14(13):4738.
6. Bartels HC, Walsh D, Nieto-Calvache AJ, Lalor J, Terlezzi K, Cooney N, et al. Anesthesia and postpartum pain management for placenta accreta spectrum: The healthcare provider perspective. Int J Gynecol Obstet. 2024 Mar;164(3):964–70.
7. Department of Anesthesiology and Intensive Therapy, RSUD Dr. Moewardi Surakarta, Medical Faculty Sebelas Maret University, Indonesia Indonesia, Ihsaniar A, Anggoro P, Department of Anesthesiology and Intensive Therapy, RSUD Dr. Moewardi Surakarta, Medical Faculty Sebelas Maret University, Indonesia Indonesia. Epidural Anesthesia Management in Cesarean Section with Placenta Accreta. J Anaesth Pain. 2022 Sept;3(3):57–60.
8. Metogo JAM, Nana TN, Ngongheh BA, Nyuydzefon EB, Adjahoung CA, Tochie JN, et al. General versus regional anaesthesia for caesarean section indicated for acute foetal distress: a retrospective cohort study. BMC Anesthesiol. 2021 Dec;21(1):68.
9. Taylor NJ, Russell R. Anaesthesia for abnormally invasive placenta: a single-institution case series. Int J Obstet Anesth. 2017 May;30:10–5.
10. Reale SC, Farber MK. Management of patients with suspected placenta accreta spectrum. BJA Educ. 2022 Feb;22(2):43–51.
11. Shuai X, Gao C, Zhang H, Zhang T, Li H, Yan Y, et al. Bladder involvement in placenta accreta spectrum disorders: 2D US combined with the 3D crystal Vue and MRI comparative analysis. BMC Pregnancy Childbirth. 2024 Nov 26;24(1):788.
12. Liang S, Lyu J, Shi H, Zhao Y, Chong Y, Hou X, et al. Management strategy for urologic morbidity in surgery of placenta accreta spectrum: stents or catheters? J Matern Fetal Neonatal Med. 2023 Dec 15;36(2):2232076.
13. Teymoordash SN, Ghahari S, Movahedi S, Safkhani Z, Gholizadeh M, Khalili S. Managing Placenta Accreta Spectrum: A case report on combining conservative care with uterine angioembolization. Int J Surg Case Rep. 2024 June;119:109774.
14. Shamshirsaz AA, Fox KA, Erfani H, Clark SL, Salmanian B, Baker BW, et al. Multidisciplinary team learning in the management of the morbidly adherent placenta: outcome improvements over time. Am J Obstet Gynecol. 2017 June;216(6):612.e1-612.e5.