*ORIGINAL ARTICLE*

Journal of Pre-Clinical and Clinical Research 2025, Vol 19, No 4, 161-163
www.jpccr.eu

# Placenta accreta spectrum (PAS) – a clinical case involving prophylactic internal iliac artery occlusion

**Kinga Kalinowska[1,A-D], Kinga Kuranc[1,A-D], Ada Krasowska[1,A-D], Karolina Pawelec[1,A-D] ✉, Anna Semczuk-Sikora[2,E-F], Rafał Oleszczuk[2,E-F]**

[1] *Student Scientific Association, Chair and Department of Obstetrics and Pathology of Pregnancy, Medical University, Lublin, Poland*
[2] *Chair and Department of Obstetrics and Pathology of Pregnancy, Medical University, Lublin, Poland*
*A – Research concept and design, B – Collection and/or assembly of data, C – Data analysis and interpretation, D – Writing the article, E – Critical revision of the article, F – Final approval of the article*

Kalinowska K, Kuranc K, Krasowska A, Pawelec K, Semczuk-Sikora A, Oleszczuk R. Placenta Accreta Spectrum (PAS): A Clinical Case Involving Prophylactic Internal Iliac Artery Occlusion. J Pre-Clin Clin Res. 2025;19(4):161–163. doi:10.26444/monz/214109

## Abstract

Placenta accreta spectrum (PAS) comprises a range of obstetric disorders characterized by abnormal placental invasion into the myometrium and surrounding tissues. The case is presented of placenta percreta in a 33-year-old gravida 5, para 3 patient with a history of three prior caesarean sections. At 29 weeks of gestation, she was admitted with suspected placenta previa and accreta. Imaging revealed multiple placental lacunae extending toward the parametrium. The patient underwent planned caesarean delivery at 34 weeks with prophylactic balloon occlusion of the internal iliac arteries. A peripartum hysterectomy was performed with successful haemorrhage control. The mother and infant were discharged in good condition. This case highlights the importance of early diagnosis, multidisciplinary planning, and the use of interventional radiology to reduce maternal morbidity in PAS.

## Key words

interventional radiology, placenta percreta, caesarean hysterectomy, placenta accreta spectrum, balloon occlusion, maternal haemorrhage

## INTRODUCTION

Placenta accreta spectrum (PAS) refers to a group of obstetric disorders characterized by abnormal trophoblastic invasion of the myometrium. Depending on the depth of invasion, PAS is classified into placenta accreta (villi in direct contact with the myometrium), placenta increta (invasion into the myometrium), and placenta percreta (invasion beyond the myometrium into adjacent structures such as the bladder or parametrium) [1]. Among these, placenta percreta poses the greatest risk to maternal health due to its extensive invasion [2].

One of the primary risk factors for PAS is abnormal uterine remodelling following caesarean section, particularly in the context of placenta previa [3]. With rising global caesarean section rates, the incidence of PAS has increased significantly, with risk correlating directly with the number of prior caesarean deliveries [4]. Other predisposing factors include prior uterine surgeries, advanced maternal age, and assisted reproductive technologies [5].

Placenta percreta is associated with life-threatening complications, such as severe haemorrhage, disseminated intravascular coagulation (DIC), thromboembolic events, and injury to adjacent organs [6]. Prenatal ultrasonographic indicators of PAS include multiple placental lacunae, obliteration of the retroplacental zone, thinning of the myometrial layer (<1 mm), and the presence of bridging vessels extending towards adjacent organs [7].

Interventional radiology has been successfully implemented and is now considered fundamental for the management of various gynaecological conditions, such as pelvic venous disease, uterine fibroids, adenomyosis and postpartum haemorrhage. The most common approach in these cases is uterine artery embolization (UAE) [8]. However, in the instances of PAS, a different method is recommended, which enables a prophylactic reduction of uterine artery perfusion. A balloon catheter is used bilaterally in internal iliac arteries to minimize potential intraoperative and postpartum bleeding [9].

Management of PAS requires a multidisciplinary team in a tertiary care setting. The current standard of care is caesarean hysterectomy, while conservative treatments remain investigational [6]. Interventional radiology has emerged as a valuable adjunct, particularly with the use of prophylactic balloon occlusion of the internal or common iliac arteries to reduce intraoperative bleeding [10].

## CASE REPORT

A 33-year-old woman, gravida 5, para 3, at 29 weeks' gestation, was admitted to the Department of Obstetrics and Pathology of Pregnancy at the Medical University of Lublin in eastern Poland due to suspected placenta previa with coexisting placenta accreta. Her obstetric history included three prior caesarean deliveries and one miscarriage. Her first pregnancy was complicated by intrauterine growth restriction (IUGR),

✉ Address for correspondence: Karolina Pawelec, Student Scientific Association, Chair and Department of Obstetrics and Pathology of Pregnancy, Medical University, Lublin, Poland
E-mail: karolina.pawelec@interia.pl

Received: 30.07.2025; accepted: 10.11.20205; first published: 20.11.2025

resulting in preterm delivery at 30 weeks with a birth weight under 2,000 grams.

During hospitalization, the patient underwent comprehensive diagnostic workup, including imaging studies consisting of three ultrasonographic examinations (USG) and magnetic resonance imaging (MRI). All tests revealed an anterior and left-sided placenta covering the internal cervical os and overlying a previous caesarean scar. Multiple turbulent lacunae were observed in the left parametrium. The results of these examinations indicated a high probability of PAS and guided the subsequent management plan.

Laboratory tests showed microcytic anaemia, corrected with intravenous iron therapy. Vitamin B12 deficiency was also diagnosed. Other laboratory parameters were within normal limits. Antenatal corticosteroids and anti-D immunoglobulin were administered. A vaginal swab culture at 30 weeks was negative for beta-haemolytic streptococci.

A planned caesarean delivery was scheduled for 34 weeks. One day prior, blood was cross-matched, and the patient received two units of red blood cells (RBCs) without complications.

On the day of surgery, under ultrasound guidance and using the Seldinger technique, vascular catheters were placed in the internal iliac arteries. Haematuria was noted upon urinary catheterization. A midline skin incision extended above the umbilicus was performed. Upon entering the abdomen, a prominently bulging placenta extending into the left parametrium was visualized, with the urinary bladder adherent to the uterine fundus.

A fundal uterine incision was made, and a live female infant weighing 2080 grams delivered. Carbetocin was administered, and temporary occlusion of the internal iliac arteries was initiated. A peripartum hysterectomy was performed. Bilateral salpingectomy was completed, and the uterus and placenta were removed *en bloc*. The vaginal cuff was sutured continuously, and a haemostatic sponge applied. Bladder integrity was confirmed using methylene blue. A pelvic drain was left *in situ*.

Postoperatively, the patient remained haemodynamically stable, afebrile, and reported moderate pain. Haematuria persisted initially. Anaemia continued postoperatively, and empirical antibiotic therapy with clindamycin and cefotaxime was initiated. Anti-D immunoglobulin was readministered. The patient was discharged on postoperative day eight in good condition, breastfeeding successfully.

## DISCUSSION

This case illustrates a classic presentation of placenta percreta in a patient with a significant history of caesarean deliveries, underscoring the well-established correlation between the number of prior caesarean sections and the risk of abnormal placental implantation [11]. Early diagnosis and planned delivery in a tertiary care setting with a multidisciplinary team are critical components in minimizing maternal and neonatal morbidity and mortality.

The definitive management of PAS remains caesarean hysterectomy, particularly in cases of placenta percreta. Conservative approaches – including leaving the placenta *in situ*, partial uterine resection with reconstruction (Triple-P), or delayed hysterectomy – are still considered experimental, and are reserved for select cases with strong fertility desires or high surgical risk [12–14]. These methods carry substantial risks, such as secondary haemorrhage, infection, and the need for reoperation.

Planning delivery in PAS must be individualized, and factors such as gestational age, maternal comorbidities, extent of placental invasion, and the patient's reproductive goals taken into consideration. Maintaining adequate haemoglobin levels, ensuring blood product availability, and administering antenatal corticosteroids are essential. Interventional radiology techniques have become increasingly integral in this setting, particularly prophylactic balloon occlusion of major pelvic vessels, which significantly reduce intraoperative blood loss and improve surgical field visualization [15, 16].

Several techniques have been described, including balloon occlusion of the aorta, common iliac, and internal iliac arteries, with or without embolization. While no consensus exists regarding the superiority of one method over another, studies suggest that aortic balloon occlusion may more effectively reduce blood loss and radiation exposure compared to internal iliac occlusion [17, 18]. Balloon occlusion has also been associated with shorter operative times, reduced transfusion requirements, and improved postoperative outcomes [19, 20].

Radiation exposure remains a concern when placing intravascular balloons during pregnancy. However, current evidence indicates that foetal exposure is minimal when procedures are performed by experienced operators, with average fluoroscopy times ranging between 121 – 218 seconds [11]. Although complications of iliac artery balloon occlusion are rare, prolonged balloon inflation (>4 hours) can lead to thrombosis, nerve damage, and limb ischaemia, underscoring the importance of timely catheter removal [19, 22].

Some studies have reported successful conservative management of PAS, but outcomes remain unpredictable, and radical treatment is often necessary. Additionally, missed prenatal diagnoses of PAS have resulted in catastrophic uterine rupture, emphasizing the need for accurate and timely antenatal imaging [3, 4, 6].

Guidelines from FIGO (2018), ACOG (2020), and the Polish Society of Gynecologists and Obstetricians (2024) recommend planned delivery between 34 – 36 weeks in a specialized centre, with caesarean hysterectomy performed without attempts at manual placental removal [23–25]. All emphasize the importance of early referral, access to interventional radiology, and comprehensive multidisciplinary planning.

## CONCLUSIONS

The presented case underscores the critical role of early prenatal diagnosis, multidisciplinary care, and access to interventional radiology in the management of PAS. The use of prophylactic balloon occlusion in conjunction with planned caesarean hysterectomy provided effective haemorrhage control and contributed to favourable maternal and neonatal outcomes. With the increasing prevalence of PAS, comprehensive protocols and experienced multidisciplinary teams are essential to ensure patient safety and improve perinatal care.

## REFERENCES

1. Zhong W, Zhu F, Li S, et al. Maternal and neonatal outcomes after planned or emergency delivery for placenta accreta spectrum: a systematic review and meta-analysis. Front Med (Lausanne). 2021;8:731412. https://doi.org/10.3389/fmed.2021.731413
2. Anderson DJ, Liu H, Kumar D, et al. Placenta percreta complications. Cureus. 2021;13(10):e18842. https://doi.org/10.7759/cureus.18842
3. Conturie CL, Lyell DJ. Prenatal diagnosis of placenta accreta spectrum. Curr Opin Obstet Gynecol. 2022;34(2):90–99. https://doi.org/10.1097/GCO.0000000000000773
4. Silver RM, Barbour KD. Placenta accreta spectrum: accreta, increta, and percreta. Obstet Gynecol Clin North Am. 2015;42(3):381–402. https://doi.org/10.1016/j.ogc.2015.01.014
5. Markfeld Erol F, Häußler JA, Medl M, et al. Placenta accreta spectrum (PAS): diagnosis, clinical presentation, therapeutic approaches, and clinical outcomes. Medicina (Kaunas). 2024;60(7):1180. https://doi.org/10.3390/medicina60071180
6. Jauniaux E, Hecht JL, Elbarmelgy RA, et al. Searching for placenta percreta: a prospective cohort and systematic review of case reports. Am J Obstet Gynecol. 2022;226(6):837.e1–837.e13. https://doi.org/10.1016/j.ajog.2021.12.030
7. Collins SL, Ashcroft A, Braun T, et al. Proposed sonographic grading of placenta accreta spectrum (PAS) disorders. Ultrasound Obstet Gynecol. 2019;53(3):346–351. https://doi.org/10.1002/uog.14952
8. Tanaka ME, Keefe N, Caridi T, et al. Interventional Radiology in Obstetrics and Gynecology: Updates in Women's Health. Radiographics. 2023;43(3):e220039. https://doi.org/10.1148/rg.220039
9. Kulkarni S, Shetty NS, Gupta A, et al. Interventional Radiology in Obstetric Emergencies. Indian J Crit Care Med. 2021;25(Suppl 3):S273-S278. https://doi.org/10.5005/jp-journals-10071–24090
10. Machado M, Dionísio T, Rocha D, et al. Placenta accreta: a case report on the role of interventional radiology. Cureus. 2023;15(10):e47680. https://doi.org/10.7759/cureus.47680
11. Cho SB, Hong S, Oh MJ, et al. Preoperative prophylactic balloon-assisted occlusion of the internal iliac arteries in the management of placenta increta/percreta. Medicina (Kaunas). 2020;56(8):368. https://doi.org/10.3390/medicina56080368
12. Horgan R, Abuhamad AZ. Placenta accreta spectrum: prenatal diagnosis and management. Obstet Gynecol Clin North Am. 2022;49(3):423–438. https://doi.org/10.1016/j.ogc.2022.02.004
13. Piñas Carrillo A, Chandraharan E. Triple-P procedure for placenta accreta spectrum (PAS) disorders: a stepwise surgical approach to reduce maternal morbidity and mortality. Best Pract Res Clin Obstet Gynaecol. 2021;41(6):914–920. https://doi.org/10.1016/j.bpobgyn.2020.07.009
14. Sentilhes L, Seco A, Azria E, et al; PACCRETA Study Group. Conservative management or cesarean hysterectomy for placenta accreta spectrum: the PACCRETA prospective study. Am J Obstet Gynecol. 2022;226(6):839.e1–839.e24. https://doi.org/10.1016/j.ajog.2021.12.013
15. Jauniaux E, Chantraine F, Silver RM, et al; FIGO Placenta Accreta Diagnosis and Management Expert Consensus Panel. FIGO consensus guidelines on placenta accreta spectrum disorders: epidemiology. Int J Gynaecol Obstet. 2018;140(3):265–273. https://doi.org/10.1002/ijgo.12407
16. Sanders TK, Stewart JK. Placenta accreta spectrum: the role of interventional radiology in multidisciplinary management. Semin Intervent Radiol. 2023;40(4):349–356. https://doi.org/10.1055/s-0043–1771038
17. Nankali A, Moeini A, Davari-Tanha F, et al. The effect of prophylactic internal iliac artery balloon occlusion in patients with placenta previa or placental accreta spectrum: a systematic review and meta-analysis. Reprod Biol Endocrinol. 2021;19(1):40. https://doi.org/10.1186/s12958–021–00722–3
18. Angileri SA, Mailli L, Raspanti C, et al. Prophylactic occlusion balloon placement in internal iliac arteries for the prevention of postpartum haemorrhage due to morbidly adherent placenta: short-term outcomes. Radiol Med. 2017;122:798–806. https://doi.org/10.1007/s11547–017–0777-z
19. Li K, Zou Y, Sun J, et al. Prophylactic balloon occlusion of internal iliac arteries, common iliac arteries and infrarenal abdominal aorta in pregnancies complicated by placenta accreta: a retrospective cohort study. Eur Radiol. 2018;28:4959–4967. https://doi.org/10.1007/s00330–018–5527–7
20. Bonavina G, De Stefano V, Giuliani E, et al. Every minute counts: a network meta-analysis comparing the effect of prophylactic endovascular procedures in abnormal placental implantation. World J Emerg Surg. 2025;20(1):43. https://doi.org/10.1186/s13017–025–00602-w
21. Hawthorn BR, Ratnam LA. Role of interventional radiology in placenta accreta spectrum (PAS) disorders. Best Pract Res Clin Obstet Gynaecol. 2021;72:25–37. https://doi.org/10.1016/j.bpobgyn.2021.01.007
22. Liu C, Gong Y, Xia Y, et al. Efficacy and safety of prophylactic abdominal aortic balloon occlusion versus internal iliac arterial balloon occlusion for placenta accreta spectrum disorder: a systematic review and meta-analysis. Clin Imaging. 2021;78:250–255. https://doi.org/10.1016/j.clinimag.2021.06.020
23. Jauniaux E, Bhide A, Kennedy A, et al. FIGO consensus guidelines on placenta accreta spectrum disorders: prenatal diagnosis and screening. Int J Gynaecol Obstet. 2018;140(3):274–280. https://doi.org/10.1002/ijgo.12408
24. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 807: Placenta Accreta Spectrum. Obstet Gynecol. 2020;135(3):e259–e275. https://doi.org/10.1097/AOG.0000000000002983
25. Huras H, Cnota W, Czajkowski K, et al. Recommendations of the Polish Society of Gynecologists and Obstetricians: placenta accreta spectrum (PAS) — prenatal diagnosis and management. Ginekol Perinatol Prakt (Gynecology, Perinatology and Practice). 2024;9(3):192–213.