Obstetrics and Gynecology

INDEX COPERNICUS INTERNATIONAL

ICV value for 2023 = 74.57

Case Report

International Journal of Medical Case Report

Successful Peripartum Management of Placenta Percreta with Bladder Invasion Using Prophylactic Internal Iliac Artery Balloon Occlusion and obstetric hysterectomy: A Rare Case Report.

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ISSN 2455-0574

Abstract

Out of the placenta accreta spectrum (PAS), Placenta percreta is the most invasive form and it causes significant risk of haemorrhage. Prophylactic bilateral internal iliac artery balloon occlusion (PBO-IIA) has been proposed to reduce haemorrhage during surgical procedure, though its effectiveness remains questionable.

We are reporting a case of 29-year-old multigravida (G3 P2 L2) pregnant women at 30 weeks of gestation with prior 2 caesarean sections who was referred to us from district hospital with antepartum haemorrhage first episode . Imaging investigations revealed placenta previa with MRI showing features of placenta accreta spectrum with placenta percreta with possibility of bladder and psoas muscle invasion. Patient was haemodynamically stable . patient was given corticosteroids for lung maturity , magnesium sulphate for neuroprotection, and tranexamic acid to control bleeding . The case was discussed with intervention radiologist and planned for elective cesarean section with prophylactic internal iliac artery ballon placement as and when required. On day 4 of admission , patient had sudden episode of bout of bleeding of around 400 cc blood transfusion started ,, and simultaneously intervention radiologist informed and patient was shifted for mri based PBO-IIA placement . Procedure done and then patient shifted for emergency cesarean, patient was haemodynamically stable .

Prophylactic bilateral internal iliac artery balloon occlusion i.e., PBO-IIA was Performed through femoral access before surgical intervention. The balloon of the armada catheter was not inflated till the delivery of baby. The placenta was seen completely invading the myometrium and coming onto the surface and uterovesical plane and therefore the baby was delivered by classical scar and then the decision for hysterectomy taken , Balloons were intermittently inflated and deflated with 10 mins on and 1 min off by radiologist which made the procedure easy and the bladder could be dissected away from uterus with average blood loss and devascularisation helped in delineating the planes clearly. The patient recovered without any complications.

Intraoperatively patient was throughout haemodynamically stable with average blood loss of 1400 cc and received only 2 units of packed red cells and no other blood products.

This case supports the selective use of PBO-IIA in placenta percreta with bladder invasion to assist in surgical treatment of condition with minimal blood loss and less time of surgery .

Keywords: - Placenta Accreta, Postpartum Haemorrhage, Prophylactic balloon occlusion, Internal iliac artery, Caesarean Section

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INTRODUCTION

Placenta percreta represents the most invasive variant and it is the morbid variant within the placenta accreta spectrum (PAS) in which a pathological continuum characterized by abnormal adherence and penetration of the placenta into or through the uterine wall. Defined by chorionic villi breaching the entire myometrial thickness and serosa, placenta percreta frequently involves contiguous organs, most commonly the urinary bladder. It poses a formidable risk for catastrophic haemorrhage, disseminated intravascular coagulation, urologic injury, hysterectomy, and even maternal death. The pathogenesis is strongly associated with defective decidualization and scarring, often following prior uterine surgeries—particularly caesarean sections. As caesarean delivery rates continue to climb globally, the incidence of PAS disorders, including placenta percreta, has risen in parallel. Recent epidemiological studies suggest a 10–30-fold increased risk of PAS in patients with placenta previa and prior caesarean sections, with the risk amplifying proportionally to the number of previous caesarean deliveries.[1]

Placenta percreta management is one of the most challenging scenarios in modern obstetrics science. In spite of recent advances in imaging techniques, surgical planning, and blood product availability, morbidity still remains high. Favourable outcomes rely on early diagnosis, multidisciplinary coordination, and well-organized operative planning. The main stem of management, classical caesarean section operation followed by peripartum hysterectomy. However, heavy blood loss remains a fatal complication even in the most controlled environment. To minimise blood loss, several vascular control measures have been explored, out of which prophylactic balloon occlusion of the internal iliac arteries (PBO-IIA) has received considerable attention as a good technique. This technique involves placement of endovascular balloon catheters in the anterior division of the internal iliac arteries via femoral access before surgical delivery of baby. The balloons may be intermittently or continuously inflated during uterine devascularization or hysterectomy to temporarily reduce pelvic perfusion. [2]

Although conceptually appealing on paper, the clinical utility or value of PBO-IIA remains questionable. Retrospective series studies and meta-analyses offer varying conflicting results, with some reporting modest reductions in blood loss during ongoing surgery and transfusion requirements, while others fail to demonstrate statistically significant differences in results in maternal or foetal outcomes. The lack of specific randomized controlled trials, heterogeneity of PAS severity across studies, and variations in performer skill and institutional protocols guidelines contribute to this uncertain environment. In addition to this, concerns regarding radiation exposure, vascular injury, thromboembolic events, and high procedural costs further complicate its routine adoption. In particular, the presence of extensive pelvic collaterals—via ovarian, lumbar, or external iliac branches—can potentially bypass the occlusion, limiting haemodynamic benefit.[3]

Bladder invasion in placenta percreta compounds the surgical difficulty. The dense fibrous adhesions and distorted pelvic anatomy increase the risk of cystotomy and ureteral injury and often necessitate sharp dissection under conditions of heavy bleeding. Some authors advocate ureteric stenting preoperatively; however, this is not always feasible in emergent scenarios. In such contexts, any technique that can reduce pelvic congestion may facilitate safer tissue handling and operative visibility.[4]

Herein, we report a rare and illustrative case of placenta percreta with imaging showing suspected bladder and psoas muscle involvement in a multigravida at 30 weeks' gestation with two prior lower segment caesarean sections. The patient was successfully managed with a multidisciplinary approach involving preoperative bilateral internal iliac artery balloon occlusion followed by emergency caesarean delivery and total abdominal hysterectomy. This case highlights the potential haemostatic value of PBO-IIA in selected patients, while also reflecting on its anatomical limitations, practical risks, and need for individualized decision-making in PAS management.[5]

CASE REPORT

A 29-year-old woman gravida 3 para 2 living 2, with two prior lower segment caesarean sections (LSCS) done 8 and 4 years ago, presented in hospital at 30 weeks of gestation with complaints of painless bleeding per vaginum. She had no known medical illness or comorbidities. On admission, she was haemodynamically stable. On investigation haemoglobin was 11.2 g/dL and her Blood Group was – O Rh Positive. Obstetric ultrasound imaging confirmed singleton foetus with complete placenta previa with possibility of placenta percreta. To confirm ultrasound findings, magnetic resonance imaging (MRI) was advised, and it revealed a grade 4 placenta previa with features suggestive of placenta percreta spectrum. Imaging demonstrated multiple intraplacental lacunae, loss of the retroplacental myometrial interface, bridging vessels across the uterovesical junction, and focal interruption of the bladder serosa. The placenta was also abutting the left psoas muscle, raising concerns for extrauterine extension.

Initial management of patient was by giving Injection Tranexamic Acid three times a day for 3 days and the bleeding was controlled and hence pregnancy was allowed to progress . The patient was administered two doses of intramuscular injection of betamethasone (12 mg, 24 hours apart) for foetal lung maturity, along with intravenous magnesium sulphate injection for fetal neuroprotection. Blood products like blood group type-specific packed red blood cells (PRBC), fresh frozen plasma (FFP), and platelet concentrates, were kept reserved for emergency. Multidepartment discussions involving obstetrics, anaesthesiology, urology, neonatology, and interventional radiology were done, and the patient was closely monitored.

During observation, patient had sudden-onset profuse vaginal bleeding, approximately 400 mL within 15 minutes. A decision was made for emergency caesarean delivery with PBO-IIA. Given the elevated risk of haemorrhage due to suspected bladder invasion, prophylactic bilateral internal iliac artery balloon occlusion (PBO-IIA) was performed via femoral artery. Under local anaesthesia in the hybrid operating suite, bilateral femoral arterial access was obtained with 7-French sheaths. Occlusion balloons (ARMADA BALLON) (6 × 40 mm) were advanced and positioned in the proximal internal iliac arteries bilaterally (Figure 1).

Figure 1:- Fluoroscopic image showing bilateral internal iliac artery balloon occlusion (PBO-IIA) with contrast delineation, performed as a prophylactic measure.

Test inflation confirmed flow cessation, and cumulative fluoroscopy time was under 2 minutes, with an estimated foetal radiation exposure of 3 mGy.

A classical midline laparotomy surgery was done, and the uterus was approached via a vertical uterine incision above the placental edge. A live male baby weighing 1.7 kg was delivered, the baby was having Apgar scores of 7 and 9 at one and five minutes, respectively. During the operative procedure, the placenta was found to be deeply adherent to the posterior wall of the urinary bladder. Careful delicate and sharp dissection in the uterovesical plane was made easy due to devascularization and achieved without bladder injury. Balloons were intermittently deflated after every 10 minutes for 1 minute during uterine

devascularization and bladder dissection. A total abdominal hysterectomy was completed uneventfully (Figure 2,3).

Figure 2:- Gross hysterectomy specimen in placenta percreta: External view showing placental invasion through the uterine wall.

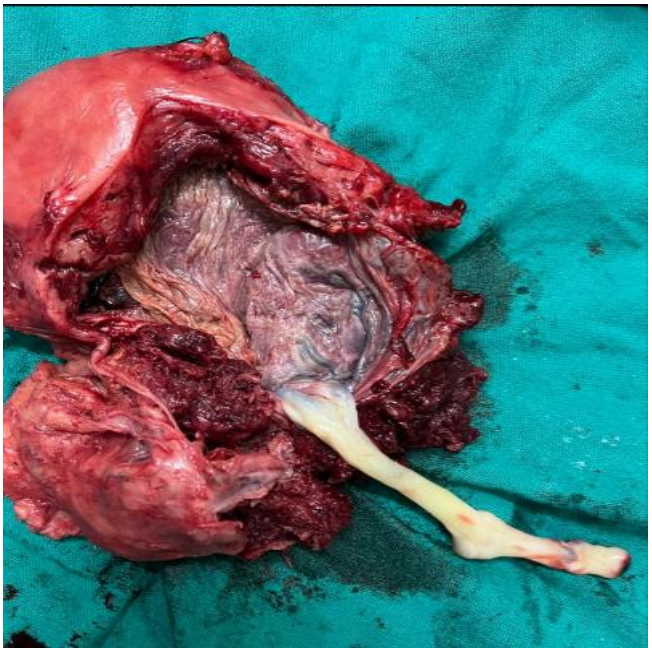

Figure 3:- Gross hysterectomy specimen in placenta percreta: Opened uterus revealing full-thickness myometrial penetration by placenta.

Estimated blood loss was 1,400 mL. The patient received two units of Packed cell volume. Postoperatively, she was monitored in the intensive care unit for 24 hours. Patient had a post operative period uneventful and , patient was discharged on 10th day

in stable condition .

Histopathological reports were traced with confirmed the findings of placenta percreta complex .

DISCUSSION

Placenta percreta remains one of the most life-threatening complications in obstetrics, particularly when associated with bladder invasion. The exponential rise in PAS disorders parallels the global increase in caesarean section rates. Given the high maternal morbidity and mortality associated with percreta, especially in the context of urologic involvement, there is increasing interest in preoperative strategies to reduce intraoperative haemorrhage and facilitate safe hysterectomy. One such adjunct is prophylactic bilateral internal iliac artery balloon occlusion (PBO-IIA), although evidence supporting its utility remains in doubt.

Our case study is similar with several other published reports where PBO-IIA was employed in managing PAS with bladder invasion. In a case study reported by Tan et al., a 34-year-old pregnant woman with placenta percreta and bladder involvement, caesarean hysterectomy surgery was done after successful bilateral internal iliac balloon occlusion. The authors noted that significant reduction in blood loss (approximately 1,000 mL) during the surgery and no bladder injury relating the outcome to improved surgical field clarity due to reduced pelvic perfusion.[6]

Like this, Shih et al. studied a case involving 36-year-old pregnant women with gravida 5 para 2 with placenta percreta and bladder involvement. The use of PBO-IIA have resulted in a controlled surgical course, with estimated blood loss under 1,500 mL. They stressed the importance of intermittent balloon inflation to minimize distal ischemic complications, a strategy mirrored in our approach .[7]

In contrast, Sentilhes et al. published a retrospective review of 22 cases of PAS, noting that although PBO-IIA reduced blood loss in certain patients, it did not eliminate the need for hysterectomy or transfusion in cases of advanced

percreta. They concluded that its effectiveness is contingent on the extent of collateral circulation and surgical timing. [8]

Another critical case was presented by Yu et al., where PBO-IIA was used in a patient with extensive bladder invasion. Although bleeding was reduced, the patient developed iliac artery thrombosis post-procedure, necessitating prolonged anticoagulation. This raises important concerns about the vascular risks associated with this technique, particularly in centres lacking endovascular expertise.[9]

Finally, Bodner et al. studied a cohort of 17 patients with suspected PAS undergoing PBO-IIA. The authors reported that in spite of minimal blood loss in the PBO-IIA group, the differences were not statistically significant when compared to matched controls who underwent surgery without balloon occlusion. They showed the need for individualized assessment techniques rather than routine use of PBO-IIA in all PAS cases.[10]

Our case is also contributing to this ongoing discussion by demonstrating that in certain cases with bladder involvement—PBO-IIA can provide meaningful benefit during surgery, facilitating safe dissection and controlled devascularization. Importantly, no balloon-related complications were experienced in our patient, and radiation exposure was kept within foetal safety thresholds. Still, limitations persist potential for thrombotic events, technical demands, cost implications, and questionable benefit in extensive pelvic collateralization.

Given these concerns, PBO-IIA should not be viewed as a universal solution but rather a context-sensitive adjunct best reserved for multidisciplinary centres with hybrid operating capabilities. Early antenatal diagnosis, team readiness, informed consent including hysterectomy contingency, and urologic preparedness remain the cornerstones of percreta management.

CONCLUSION

This case focuses the significant role of prophylactic bilateral internal iliac artery balloon occlusion (PBO-IIA) as a complement in the surgical management of placenta percreta with bladder invasion. While PBO-IIA did not prevent the need for hysterectomy, it facilitated operative control and reduced blood loss without vascular or urologic complications. However, its efficacy is highly dependent on anatomical factors, operator expertise, and institutional resources. Given the mixed evidence, PBO-IIA should be selectively employed within a multidepartment, well-equipped setting, with individualized risk-benefit assessment and preparedness for definitive surgical management.

Conflict of interest

None

Source Of Funding

None

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Author Contribution:- SS,AP,BD: Conceptualized, supervised, revised, and edited the manuscript. IS,AG: Acquisition of data. Wrote the original draft, revised, and edited the manuscript.

Received : 25-04-2025 Revised: 20-05-25 Accepted : 20-06-25