



Management and Outcomes of Placenta Accreta Spectrum (PAS) at Tertiary Hospital in Bali: Descriptive Case Series Study



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ABSTRACT

Objectives: To describe the management and outcomes of placenta accreta, increta, and percreta at a tertiary hospital in Bali, Indonesia.

Background: There are three variants of abnormal placentation: placenta accreta, placenta increta, and placenta percreta. The lack of data and review studies on Placenta Accreta Spectrum (PAS) in Indonesia, including Bali, makes it difficult for clinicians to diagnose and predict potential morbidity.

Methods: A prospective case series of 41 pregnancies with placenta accreta identified between 2018 and 2020 at Sanglah Hospital, a tertiary hospital in Bali, Indonesia.

Results: Among the cases, 1 was a primigravida with placenta accreta (2.6%), 4 cases (10.5%) had PAS without a history of prior cesarean section, and 20 cases (52.6%) had PAS without a history of curettage. Thirty-two cases (84.2%) had anterior placental implantation, while 6 cases (15.8%) had posterior placental implantation. The median Placenta Accreta Index (PAI) score was 6 (range: 1.25–10). All cases were managed with elective cesarean hysterectomy, with the median blood loss being 2,000 mL (range: 400–13,300 mL). Bladder rupture occurred as a complication in 11 cases (28.9%), and relaparotomy was performed in 3 cases (7.9%). Twelve cases (31.6%) required postoperative blood transfusion, and 28 cases (73.7%) required intensive postoperative care in the ICU/HCU.

Conclusions: Antenatal history-taking and ultrasound examination are essential for predicting Placenta Accreta Spectrum (PAS). Once PAS is diagnosed, a multidisciplinary approach should be implemented to reduce maternal and perinatal morbidity and mortality.

Keywords: Placenta accreta spectrum, Management, Outcome.

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BACKGROUND

In some patients, the placenta becomes morbidly adhered to the uterine wall and may occasionally continue to grow outside the uterus, invading surrounding organs. This condition is called Placenta Accreta Spectrum (PAS). PAS is categorized based on the depth of invasion and includes placenta accreta, increta, and percreta.¹

Placenta accreta was first described in 1937 by Irving and Hertig as a histopathological term referring to the “abnormal adherence of the afterbirth, in whole or in part, to the underlying uterine wall in the partial or complete absence of decidua.” The incidence of PAS has increased globally from 1 in 2,500 pregnancies to 1 in 500 pregnancies, largely due to the rise in cesarean section rates.

This increase has led to higher maternal and fetal morbidity and mortality.^{1,2}

The main risk factor for placenta accreta is a history of previous cesarean delivery, particularly when accompanied by a coexisting placenta previa. This is of particular concern given the rising rates of cesarean deliveries and older maternal age at the time of childbirth.³ Numerous studies have identified factors that may contribute to the increased risk of PAS, such as shorter intervals between previous cesarean sections and the current pregnancy, multiparity, placenta previa, assisted reproduction techniques, submucosal leiomyomas, smoking, and hypertension.^{2,3}

PAS can be diagnosed during pregnancy using ultrasound and/or

magnetic resonance imaging. Several prenatal ultrasound features of PAS include the disappearance of the normal retroplacental interface (clear zone), extreme thinning of the myometrium, and vascular changes of the placenta (lacunae) and placental bed (hypervascularity).¹ Prenatal diagnosis has been shown to reduce maternal morbidity and mortality, as it allows for better planning of surgery, arrangements for interventional radiology, availability of blood products and cell salvage, and selection of the most appropriate surgical technique.²

METHODS

This study included all women diagnosed with placenta accreta, increta, or percreta

who delivered at Sanglah Hospital between January 2018 and December 2020. The diagnosis of PAS in all cases was confirmed postnatally through histopathological examination of the placenta. Microsoft Excel and SPSS software were used to collect and identify all cases that presented to the Obstetrics and Gynecology Emergency Department or Outpatient Clinic at Sanglah Hospital during this period. All samples were followed up until delivery and recorded in a single data sheet for tabulation.

Descriptive analysis was performed to assess the characteristics, management, and maternal outcomes of cases suspected of having placenta accreta, increta, or percreta antenatally. All data were analyzed using SPSS version 26.0.

RESULTS

The distribution of research data showed that the median age was 33.5 years (range: 23-44). Eleven cases (28.9%) were above 35 years old, and 27 cases (71.1%) were under 35 years old. Most cases of PAS in this study occurred in the third pregnancy, with 17 cases (44.7%), and only 1 case was in the first pregnancy. Four cases (10.5%) had placenta accreta without a history of previous cesarean section (CS), and 20 cases (52.6%) had placenta accreta without a history of previous curettage. Histopathological examination confirmed PAS in 35 cases, 3 cases were lost to follow-up, and 1 case was misdiagnosed with normal pathology results.

A total of 38 cases in this study underwent antenatal ultrasound diagnostic evaluation. Of these, 32 cases (84.2%) had anterior placental implantation, and 6 cases (15.8%) had posterior placental implantation. Based on the presence of placental lacunae, 12 cases (31.6%) had grade 2 placental lacunae, and 18 cases (47.4%) had grade 3 placental lacunae. Additionally, 12 cases (31.6%) showed loss of retroplacental clear space, and 20 cases (52.6%) demonstrated disruption of the bladder on ultrasound examination. Regarding myometrial thickness, 16 cases (42.1%) had a thickness of <1 mm, 18 cases (47.4%) had a thickness of 1-3 mm, and 4 cases (10.5%) had a thickness >3 mm. Furthermore, nearly 84.2% of cases (32 cases) displayed a bridging vessel feature,

with a median PAI score of 6 (range: 1.25-10).

All cases in this study were managed with elective cesarean hysterectomy. The median blood loss across all cases was 2,000 mL (range: 400-13,300 mL). Bladder perforation during surgery occurred in 11 cases (28.9%), and relaparotomy was performed due to active bleeding in the abdomen or vagina after cesarean hysterectomy in 3 cases (7.9%). Only 12 cases (31.6%) required postoperative blood transfusion, with a median of 2.5 bags of packed red cells (PRC) (250 cc/bag). None of the cases in this study required transfusion of thrombo-concentrates (TC) or fresh frozen plasma (FFP). Among the 38 cases, 10 cases (26.3%) did not require intensive postoperative care, while the remaining 28 cases (73.7%) required intensive care in the ICU or HCU. The median length of stay in the intensive care unit was 1 day (range: 0-3 days).

DISCUSSION

The outcomes of Placenta Accreta Spectrum (PAS) are improved when managed in centers with multidisciplinary expertise, including maternal and fetal medicine, gynecology, gynecologic oncology, vascular and trauma surgery, urology, transfusion medicine, intensive care, neonatology, interventional radiology, and anesthesiology.^{1,2} Most of the cases in this study were referrals from district hospitals around Bali, as Sanglah Hospital is the only tertiary hospital in Bali.

This study found that the median age of patients with PAS was 33.5 years (range: 23-44). In comparison, a study by Zhong et al. presented 21 patients with a median age of 28 years (range: 23-33). Fifty percent of the cases in our study had two previous cesarean sections, and four patients had placenta accreta without a history of previous cesarean section. Additionally, 47.4% (18/38) of cases had a history of curettage. In Zhong et al.'s study, 21 patients with placenta accreta had previous cesarean sections (4/21), curettage (15/21), or uterine malformations (7/21).⁴ A cohort study involving 3,889 pregnancies with placenta previa or low-lying placenta and one or more prior cesarean deliveries screened

for placenta accreta found 328 cases of placenta previa with accreta (8.4%), of which 298 (90.9%) were diagnosed prenatally by ultrasound. The study also showed that 75% of placenta accreta cases were suspected on antenatal ultrasound, with risk factors such as previous cesarean delivery, uterine curettage, or a Müllerian anomaly. The incidence of placenta previa with accreta was 4.1% in women with one prior cesarean and 13.3% in women with ≥ 2 prior cesarean deliveries.¹

In our study, 84.2% (32/38) of cases had anterior placental location on ultrasound. Morgan et al. found that 59% of cases in their cohort of 86 pathology-confirmed placenta accreta had anterior placental implantation. Anterior placenta accreta is histologically and clinically associated with more severe disease than posterior placenta accreta. Posterior placental location is often linked to delayed diagnosis and surgical complications.⁵

Transvaginal ultrasound between 11 and 14 weeks of gestation in women with prior cesarean delivery can identify at least three of four cases of PAS. The Placenta Accreta Index (PAI) may help predict individual patient risk for morbidly adherent placenta.⁶ In our study, the median PAI score from 34 of 35 cases was 6 (range: 1.25-10), with only one case misdiagnosed with normal placenta. A study by Sefty M. et al. found that in 21 placenta previa patients with prior cesarean sections, 10 (47.6%) were histopathologically confirmed as having abnormal placental invasion. A PAI score of 4 was found to be a useful cutoff for predicting placental invasion in patients with placenta previa.⁷ The statistical accuracy of PAI and histopathological findings in patients with placenta previa was 0.762, indicating good prediction.⁷

Several prenatal ultrasound features of PAS have been reported over the past 35 years, including the disappearance of the normal retroplacental interface (clear zone), extreme thinning of the myometrium, and vascular changes within the placenta (lacunae) and placental bed (hypervascularity).¹ In this study, 84.2% (32/34) of cases showed bladder disruption on antenatal ultrasound, which may result from villous invasion into the muscle of the posterior bladder wall. Myometrial

thinning to <1 mm or the absence of detectable myometrium on ultrasound is a key prenatal sign of placenta accreta.¹ Lacunae of $\geq$ Grade 1+ had sensitivity, specificity, positive predictive value, and negative predictive value of 86.9%, 78.6%, 76.9%, and 88.0%, respectively. For lacunae of $\geq$ Grade 2+, the sensitivity, specificity, positive predictive value, and negative predictive value for diagnosing placenta increta or percreta were 100%, 97.2%, 93.8%, and 100%, respectively, with no hysterectomy performed in cases where lacunae were absent.¹ This study found that 16 cases (42.1%) had myometrial thickness <1 mm.

In this study, 32 cases (84.2%) showed bridging placental vessels. A study by Rac et al. (2015) involving 184 gravidas found that 54 (29%) had confirmed placental invasion on hysterectomy specimens. All sonographic parameters were significantly associated with placental invasion ($P < 0.001$). The PAI may help predict the risk of morbidly adherent placenta.⁶

All 38 patients in this study underwent elective cesarean hysterectomy at 37 weeks' gestation. Antenatal diagnosis is associated with reduced maternal hemorrhagic morbidity. Delivery at 34 0/7 – 35 6/7 weeks of gestation is suggested as the preferred gestational age for scheduled cesarean delivery or hysterectomy. The most generally accepted approach for PAS is cesarean hysterectomy with the placenta left in situ after delivery of the fetus. Conservative management should only be used in highly selected cases, and cesarean hysterectomy is considered the preferable treatment when available.¹⁰ Delayed interval hysterectomy is an expectant approach to minimize hemorrhage and tissue damage in cases where future fertility is not a consideration.⁸

Cesarean hysterectomy is associated with maternal morbidity, including life-threatening hemorrhage, infection, bladder or bowel injury, and ICU admission.⁹ In this study, the median blood loss in accreta cases with cesarean hysterectomy was 2,000 mL (range: 400–13,300 mL). This outcome largely depends on the experience of the surgeon and preparations to anticipate complications. Another study reported an estimated mean

blood loss of $1,416 \pm 699$ mL in cesarean hysterectomy for placenta accreta, with an average blood loss of 3,000–5,000 mL. Up to 90% of patients require a blood transfusion.⁹ The median expected blood loss for cesarean hysterectomy in placenta accreta cases has been reported as 3 liters, with a mean transfusion requirement of 5 bags of packed red blood cells.¹⁰ Women with placenta percreta experience significantly more blood loss ($P = 0.02$) and longer operative time ($P = 0.007$) compared to those with placenta accreta or increta.⁹ This study found that the median number of PRC bags transfused was 2.5 (range: 0–9), with the median TC and FFP requirements being 0 (range: 0–10) and 0 (range: 0–5), respectively. Surgery complications included bladder perforation in 11 cases (28.9%) and relaparotomy due to intra-abdominal or vaginal bleeding in 3 cases (7.9%).

In this study, 10 cases (26.3%) did not require intensive care post-surgery, with a median length of stay in the ICU of 1 day (range: 0–3). A study by Mitrick et al. reported that prenatal diagnosis of PAS resulted in lower ICU admission rates (23% vs 43%), with only 8.5% of patients requiring ICU admission after surgery and a length of stay of 5.2 days.⁹

CONCLUSIONS

Antenatal history-taking and ultrasound examination are essential for predicting the presence of Placenta Accreta Spectrum (PAS). Once the PAS diagnosis is confirmed, it should be managed using a multidisciplinary approach to reduce both maternal and perinatal morbidity and mortality.

ETHICAL CONSIDERATIONS

The authors stated that this article corresponds to the hospital research protocol and the informed consent has been obtained from the patient.

DECLARATION OF CONFLICTING INTERESTS

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AUTHOR CONTRIBUTIONS

All authors contributed to data gathering, analysis, drafting, and revising and approving the article regarding this research to be published.

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