Current Obstetrics and Gynecology Reports (2024) 13:195–206
https://doi.org/10.1007/s13669-024-00395-w

REVIEW

Conservative Management of Placenta Accreta Spectrum: A Modern Treatment Alternative to Cesarean-Hysterectomy

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Accepted: 2 May 2024 / Published online: 23 May 2024

Abstract

Purpose of Review This review summarizes conservative management of placenta accreta spectrum (PAS) disorders, also termed leaving the placenta in situ. The discussion includes clinical considerations in deciding between cesarean-hysterectomy and conservative management, as well as intrapartum and postpartum conservative management techniques.

Recent Findings A growing body of evidence supports conservative management of PAS for both reduction of morbidity and uterine preservation. Compared to cesarean-hysterectomy, conservative management of PAS is associated with lower maternal morbidity, including blood loss, transfusion, operative injury, and intensive care unit admission. However, intensive, long-term postpartum surveillance is required to monitor for complications such as infection, bleeding, and coagulopathy. These risks should be balanced with an individual's risk profile and personal desires provided by a multidisciplinary, experienced PAS care team.

Summary We provide recommendations for patient-centered care planning, resource requirements, and conservative management techniques. Conservative management of PAS is a feasible alternative to cesarean-hysterectomy, and options for management should be discussed with all pregnant individuals with PAS.

Keywords Placenta accreta spectrum · Conservative management · Cesarean-hysterectomy · Delivery planning

Introduction

Placenta accreta spectrum (PAS) disorders occur in 1 of 272 deliveries and are a significant cause of maternal morbidity [1]. PAS is defined as pathological adherence of the placenta to the myometrium. PAS results from disruption of the endometrial-myometrial interface [2], and this insult has increased the PAS incidence from the rising cesarean delivery (CD) rates [3, 4]. PAS is associated with considerable maternal morbidity such as massive blood transfusions, intraoperative urinary tract and bowel injury, infection, and intensive care unit (ICU) admission [5]. The current optimal management strategy for PAS in the United States is considered hysterectomy immediately following CD, which remains associated with high rates of severe maternal morbidity. Alternatives to cesarean-hysterectomy have the potential to preserve the uterus and reduce morbidity. These approaches have become more widely explored internationally and are beginning to be studied in the United States [6•, 7•]. In this review, we describe conservative management of PAS, primarily with an intentionally retained placenta, the risks and benefits compared to cesarean-hysterectomy, and patient perspectives.

Definitions of PAS

Pathological diagnosis of PAS can only be made with the hysterectomy specimen or myometrial resection, and this has traditionally been considered the "gold standard" of diagnosis [8••]. Pathologically, PAS is defined by the loss of the decidual layer between villous tissue and the myometrium [2]. The histological diagnosis of PAS is divided into grades with increasing depth of invasion. The traditional terms accreta, increta, and percreta correspond to Grades 1, 2, and 3, respectively [9].

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When the uterus remains in situ, placental pathology can be used to aid in diagnosis, but is not definitive [10, 11]. With the increasing use of uterine-preserving management of PAS, the International Federation of Gynecology and Obstetrics (FIGO) devised a clinical classification of PAS at the time of delivery when confirmatory pathologic specimens are unobtainable [12]. The FIGO clinical grading system, similar to the pathological grading system, suggests increasing depth of placental invasion with higher grades:

- Grade 1: PAS (adherent placentas and placenta accreta) is characterized by failure to extract the placenta with gentle traction or manual extraction at the time of vaginal or cesarean delivery.
- Grade 2: PAS (increta) is characterized by placental bed bulging and hypervascularity of the serosa, or uterine inversion with gentle traction.
- Grade 3: PAS (percreta) is characterized by the above findings and visualized placental tissue in the serosa (3a), bladder (3b), and broad ligament, pelvic sidewalls, or other pelvic organs (3c).

Antenatal Diagnosis of Placenta Accreta Spectrum

Antenatal diagnosis has transformed PAS care and improved outcomes by allowing for delivery preparation [13–15]. Recent data from high-volume referral centers provide PAS detection rates of 74% and 40% for pregnancies with and without placenta previa, respectively [16, 17•]. At times, PAS may first be diagnosed at the time of delivery [11].

Methods for Placenta Accreta Spectrum Management

Cesarean-hysterectomy

Preterm cesarean-hysterectomy at 34–35 weeks is currently considered the optimal PAS management strategy used in over 90% of deliveries with PAS [18–21]. The hysterotomy is made away from the placenta, and following delivery of the infant, the placenta is left in situ while the hysterotomy is closed and a hysterectomy is performed. No attempt should be made to remove the placenta as attempts have been associated with significantly higher blood loss [13, 15].

Cesarean-hysterectomy dramatically reduced maternal mortality associated with PAS from 7% in the early 1990s to less than 1% over three decades [22–24•]. However, cesarean-hysterectomy is associated with considerable maternal morbidity, including postpartum hemorrhage, massive transfusion, urinary tract injuries, and ICU admission [25]. In case series of cesarean-hysterectomies for PAS, rates of blood transfusions requiring four or more units of blood, re-operation, intentional or unintentional cystotomy, and maternal ICU admission were 42–70%, 4–15%, 17–23%, and 28–65%, respectively [13, 14, 26, 27]. Conservative PAS management is an alternative strategy to avoid the associated risks and loss of fertility with cesarean-hysterectomy.

Conservative Management

The term "conservative management of PAS" can be used broadly to encompass any strategy that preserves the uterus or refer specifically to leaving the placenta in situ. Two other categories of PAS management allowing for uterine preservation are uterine resection-reconstruction and delayed-interval hysterectomy. Here, we use the term conservative management of PAS to indicate leaving the placenta in situ, unless otherwise specified. The approach begins similarly to cesarean-hysterectomy, with the same timing and preparation for delivery, but diverges after delivery when the hysterotomy is closed and both the placenta and uterus are left in the pelvis. During the postpartum period, blood supply to the uterus and placenta is substantially reduced with time. If left in situ, the placenta loses the fetoplacental circulation and beta-human chorionic gonadotropin levels become undetectable. Slowly, placental necrosis occurs and facilitates natural separation from the uterus and adjacent organs, obviating the need for peripartum hysterectomy and its associated complications [28]. Whether the placenta resorbs, dissolves, or separates in pieces is not clearly defined. Therefore, we will use the term "placental resolution" to describe this poorly understood process. However, complications can occur as seen in other individuals with retained products of conception, which are predominantly bleeding, coagulopathy, and infection.

Though conservative management has been studied since at least 1940 [29], it achieved international attention in 2020 when a large prospective, multicenter study was presented that compared maternal outcomes after conservative management or cesarean-hysterectomy using propensity score weighting to account for potential indication bias [30]. In this study (PACCRETA), 86 pregnant individuals underwent conservative management and 62 had a cesarean-hysterectomy [31••]. In the six months following delivery, conservative management resulted in lower rates of transfusing greater than 4 units of packed red blood cells (16% vs. 59%; adjusted risk ratio [aRR]: 0.3, 95% confidence interval [CI]: 0.2–0.5) relative to the cesarean-hysterectomy group [31••]. Conservative management was also associated with lower rates of hysterectomy (22% vs. 100%; $p < 0.001$), estimated blood loss exceeding 3000 mL (11% vs. 46%; aRR: 0.3, 95% CI: 0.2–0.5), any transfusion of blood products (38% vs. 87%;

aRR: 0.5, 95% CI: 0.3–0.6), adjacent organ injury (5% vs. 13%; aRR: 0.3, 95% CI: 0.1–0.8), and non-hemorrhage related severe maternal morbidity (6% vs. 16%; aRR: 0.4, 95% CI: 0.2–0.9) when compared to the cesarean-hysterectomy group [31••]. Importantly, several increased risks were noted with conservative management. Arterial embolization was used more frequently in the conservative management group than the cesarean-hysterectomy group (24% vs. 3%; aRR: 12.1, 95% CI: 3.8–38.4) [31••]. Higher rates of endometritis (11% vs. 0%; $p = 0.02$) and readmission within six months (29% vs. 3%; aRR: 12.1, 95% CI: 3.9–37.4) were also seen with conservative management [31••]. In cases of readmission, common indications included infection (67%) and abnormal bleeding (25%) [32•]. For women who required a delayed hysterectomy, median time from delivery was 51 days (interquartile range [IQR]: 44–63 days) with bleeding representing the most common etiology [32•]. Similar findings were found in two retrospective cohort studies comparing cesarean-hysterectomy to conservative management in Canada (n = 10 with conservative management) and Turkey (n = 15 with conservative management) [33, 34].

When considering these significant differences, cautious interpretation should be utilized as medical and surgical management varied with respect to surgical artery ligation, uterine compression sutures, antibiotics, and uterotonic agents between groups [31••]. These variations in adjunctive treatments underscore the difficulty in analyzing and predicting outcomes despite protocolized care to develop an optimal care consensus.

Delivery

The conservative management approach begins with the abdominal incision, which may be transverse or vertical, but should allow for a hysterotomy away from the placenta and adequate pelvic exposure for a possible hysterectomy. The infant is delivered, and the cord is ligated near the placental cord insertion site. If there is no clinical evidence of PAS, gentle traction on the umbilical cord may be used to evaluate for spontaneous placental separation. If no separation occurs, the hysterotomy is closed followed by the abdominal wall and skin. This is the basic procedure of conservative management of PAS. However, many adjunctive treatments have been proposed. For most treatments, the evidence is equivocal and further study is required. No strong evidence exists for or against the use of uterotonics, uterine artery embolization, prolonged prophylactic antibiotics or venous thromboembolism prophylaxis [28, 35]. Of note, expert recommendations advise against the use of methotrexate from one methotrexate-associated maternal death and lack of theoretical benefit [18, 19, 36]. Potential adjunctive treatments are summarized in Table 1.

Postpartum

The primary strategy for postpartum management is expectant management without intervention. The majority of individuals will not require hysterectomy, but many will experience mild-to-moderate complications. In the PACCRETA study, 27% of individuals with conservative management were readmitted after delivery at a median of 51 days (IQR: 20–75 days) [31••]. In the first days, hemorrhage is the greatest risk, which can be alleviated by uterine artery embolization. Uterine artery embolization can increase pain and lead to uterine necrosis and endometritis. Thus, this procedure should be performed by an interventional radiologist familiar with postpartum embolization and experience working with the placenta in situ. The overall risk–benefit ratio of uterine artery embolization has not been defined, but preliminary data may suggest a faster rate of placental resolution [47]. Prolonged prophylactic antibiotics are also of unclear effectiveness. However, given the high risk of endometritis [31••], we propose routine post-operative endometritis prophylaxis for 2–3 days as per individual hospital guidelines and antibiogram.

In the first two months after delivery, placental size and blood flow will not decrease significantly [60•]. Hence, individuals should be counseled regarding expected and warning signs and symptoms during the postpartum period. Expected findings following conservative management include mild to moderate uterine contractions, moderate abdominopelvic pain, vaginal discharge, and vaginal bleeding not greater than menstruation. Most individuals experience waxing and waning bleeding in addition to bloody vaginal discharge, with some passing clots or tissue fragments. Concerning findings requiring prompt medical attention include fever, severe abdominopelvic pain, foul smelling vaginal discharge, and heavy vaginal bleeding.

Postpartum follow-up is extensive to monitor for complications. We perform weekly office visits during the month postpartum followed by visits every 2–4 weeks until placental resolution is complete. During these visits, a careful review of symptoms and discussion of activities of daily living is completed. Vital signs and a physical examination are performed to screen for infection, abnormal bleeding, and surgical complications. Furthermore, laboratory studies including complete blood count, prothrombin time, partial thromboplastin time, and fibrinogen are performed at each visit to evaluate for anemia, coagulopathy, inflammation, and infection. Urine and vaginal cultures have also been suggested, but we have not found these tests to add value in individuals without a clinical suspicion of infection. Lastly, a sonographic assessment of the uterus and placenta is completed to evaluate for residual retained tissue, vascularity, and uterine defects. Individuals undergoing conservative management of PAS should understand

Table 1 Adjuvant Treatment Strategies for Conservative Management of Placenta Accreta Spectrum Disorders (PAS)

Recommendation & Quality of Evidence[a]	Benefits & Evidence Supporting Recommendation	Risks & Concerns with Recommendation
Forcible manual attempt at removal of the placenta during delivery is not recommended, but gentle cord traction is acceptable in low-risk cases (Evidence: High)	• Decrease blood loss and morbidity with avoidance of manual removal [13] • Gentle cord traction in low-risk cases can avoid unnecessary hysterectomy with false-positive diagnosis	• False-positive diagnosis of PAS cases on prenatal ultrasound may lead to unnecessary hysterectomy: ~ 28% [3, 13, 18, 37, 38]
Prophylactic uterotonics may be used in cases with no clinical evidence of invasive PAS disorders (Evidence: Low)	• Reduce blood loss attributable to uterine atony	• No data to support or refute use among individuals with PAS • Theoretical concern for inducing placenta detachment and bleeding [19]
Methotrexate is not recommended to facilitate placental resolution (Evidence: Moderate)	• Placental trophoblasts are terminally differentiated and non-proliferative, thereby reducing methotrexate's ability to target these cells • Associated chemotherapy risks (ie. neutropenia, hepatic injury, mucositis, etc.) [39] • One methotrexate-associated maternal death [18] • Contraindicated with breastfeeding [39]	• Biologically plausible mechanism for targeting placental trophoblasts • Mixed, sparse data to support improved maternal outcomes and accelerated placental resolution rate [40•, 41–44]
Uterine artery embolization is not routinely recommended for surgical risk prevention (Evidence: Low)	• Increase risk for infection, pain, and uterine necrosis [18, 35, 45, 46] • No data to guide prophylactic versus therapeutic embolization needs, vessel occlusion media, or timing of intervention	• Some evidence for decrease in blood loss immediately after delivery and hastening of placental resolution [47]
Postoperative antibiotics should be used to prophylactically minimize infection risk (Evidence: Low)	• Theoretical prevention of infectious complications	• No data available on efficacy • Antibiotic resistance, adverse effects, cost and time burden
Beta-HCG[b] monitoring should not be used to monitor for residual in situ placenta (Evidence: Low)	• No correlation between beta-HCG and residual placental tissue or volume [48, 49]	• Noninvasive marker that may allow surveillance of residual placental trophoblasts
Additional Considerations[c]	**Benefits & Evidence Supporting Intervention**	**Risks & Concerns with Intervention**
Anticoagulation for postpartum venous thromboembolism risk prevention	• Theoretical reduction in postpartum venous thromboembolic events [50]	• No data available on efficacy • Potential increase in postpartum bleeding and hemorrhage risk • Medication cost and compliance • Limited anticoagulation agents compatible with breastfeeding [51]
Hysteroscopic resection of retained placental tissue	• Potential for accelerated removal of retained placental tissue to decrease ongoing hemorrhage and infection risk [52–54] • If successful, reduction of total time warranting postpartum surveillance	• No data available on efficacy • Procedure risks including uterine perforation, hemorrhage, infection, synechiae formation, pain, and unsuccessful tissue removal requiring multiple attempts [18, 28, 55] • Limited documentation in studies denoting indications for hysteroscopic resection

Table 1 (continued)

Additional Considerations[c]	Benefits & Evidence Supporting Intervention	Risks & Concerns with Intervention
Delayed hysterectomy	• Decreased uteroplacental blood flow and placental invasion into adjacent organs, potentially reducing blood loss and organ injury compared to immediate hysterectomy in percreta cases [56–58] • Definitive treatment compared to conservative management	• Requires second abdominal surgery 4–6 weeks after delivery • Fertility loss • One expert opinion: Unclear added value and potentially increased morbidity compared to uncomplicated conservative management [59]

[a] Recommendations and quality of evidence from the International Federation of Gynecology and Obstetrics Consensus Guidelines[36]

[b] HCG: human chorionic gonadotropin

[c] Additional considerations are not found in the above consensus guidelines but represent published management treatments

that hysterectomy is the definitive treatment and can be requested at any time. When hysterectomy becomes safer is not clear, but after uteroplacental vascularity has decreased is a reasonable benchmark.

In a retrospective, multicenter cohort study, natural placental resolution occurred at a median of 13.5 weeks (range: 4–60 weeks) after delivery in the 75% of cases that did not require additional interventions [18]. From more recent, prospective data, complete placental resolution may take longer with a median greatest diameter of placental tissue of 71 mm (IQR: 37–108 mm) at 1–2 months postpartum and 34 mm (IQR: 17–60 mm) at 3–6 months postpartum [31••]. In our experience, the median time to resolution is 18 weeks (range: 5–25 weeks) [60•]. In cases with persistently retained tissue, consideration can be given to hysteroscopic resection, though the optimal indications and timing are not known. In one study, hysteroscopic resection or curettage to evacuate the retained placenta occurred at a median of 20 weeks (range: 2–45 weeks) after delivery with PAS diagnosis confirmed on specimen examination [52]. However, hysteroscopic resection should not be utilized to expedite the process of placental resolution, but only to remove tissue that remains in an asymptomatic individual. Advice on sexual intercourse is not evidence-based, though some recommend abstinence or condom use until complete placental resolution for infection prevention. Activities of daily living and exercising do not require limitation.

Management of Complications

There is a paucity of detailed information on complications related to conservative management of PAS. For specific details, the reader is referred to our previously published case series [60•]. Massive hemorrhage is relatively rare and must be treated with hysterectomy. Pain is common, and although it varies in severity, it may lead individuals to request a hysterectomy. Management should include standard post-operative pain control techniques. However, disseminated intravascular coagulation (DIC) is a unique complication. DIC from conservative management of PAS is indolent and does not require emergent treatment unlike acute DIC from hemorrhage. Symptoms of DIC include increased vaginal bleeding or brighter red colored blood. Otherwise, evidence of coagulopathy may only be noted on surveillance laboratory studies. Laboratory evidence of DIC is characterized by low platelets in isolation or combination with low fibrinogen and correlates more with chronic DIC noted in adults with malignancy. Diagnostic criteria for DIC were published by the International Society on Thrombosis and Haemostasis in 2001, but have been criticized for poor sensitivity [61, 62]. Given the increase in fibrinogen during pregnancy and lack of normative data on coagulation parameters in individuals undergoing conservative management

of PAS, we consider platelets < 150,000/uL or fibrinogen < 200 mg/dL abnormal. If symptomatic with increased bleeding and hypofibrinogenemia < 200 mg/dL, we suggest plasma, cryoprecipitate, or fibrinogen concentrate transfusion, although treatment for mild symptoms or laboratory abnormalities alone is controversial.

Endometritis is a significant contributor to hysterectomy after conservative management of PAS. Endometritis related to a retained placenta can be identical to acute postpartum endometritis with fever, uterine tenderness, and leukocytosis, or similar to chronic non-pregnancy-associated endometritis with only uterine tenderness [63]. Thus, a high index of suspicion is needed for endometritis. Oral antibiotics can be trialed, and if no improvement occurs, hospitalization for intravenous antibiotics should be performed. These individuals should be counseled that hysterectomy may be necessary if infection progresses or resists medical management. Individuals with any complication of conservative management of PAS should always be offered hysterectomy as the definitive treatment.

Pregnant Individuals' Perspectives

Ultimately, cesarean-hysterectomy leads to loss of childbearing potential, with some individuals reporting a long and painful recovery from childbirth [64•]. Loss of fertility has been associated with lower self-esteem and societal status during a pivotal time for protecting reproductive autonomy in the United States [37, 65•]. A diagnosis of PAS causes significant stress and anxiety for many pregnant individuals [66•]. With the known severe maternal morbidity associated with PAS and routine preterm cesarean-hysterectomy, concerns are both common and expected. Cesarean-hysterectomy and conservative management for PAS confer different patient-centered advantages and disadvantages. Antenatally, pregnant individuals with PAS describe initial shock and lack of familiarity with their diagnosis which signals the need for better education towards pregnant individuals at risk early in pregnancy [67•].

Autonomy of choosing a management strategy may be desired by some individuals with PAS. PAS managed by cesarean-hysterectomy is associated with birth-related trauma, post-traumatic stress disorder, grief, and depression related to loss of future fertility and subsequent negative impacts on the relationships with their partners [66•, 68•, 69•]. These impacts can manifest as differential experiences of trauma, disconnection, and loss of libido between partners. A semi-structured interview study of 17 individuals with a diagnosis of PAS suggested that emotional distress, perceptions of helplessness, uncertainty during the pregnancy, and an altered birth experience contribute to birth trauma [66•]. A theme of "medical helplessness" emerged with most participants being told that preterm cesarean-hysterectomy was the only option. In a survey of 347 individuals with a history of PAS, the participants valued information and choice about the mode of anesthesia, highlighting choice as a critical element for pregnant individuals with PAS [70•].

Separate from the specific desire for autonomy, individuals have preferences related to their values and lifestyle. Conservative management of PAS offers the possibility of avoiding a major surgery and preserving future fertility. However, the frequent postpartum follow-up for months, even without complications, may be painful, inconvenient, time-consuming, and anxiety-provoking to the individual and their family [71•]. Shared decision-making with the pregnant individual is important, even when one strategy is preferred for medical or logistical reasons.

Management Decisions

There are two primary reasons conservative management has been favored over cesarean-hysterectomy. First, the pregnant individual desires future fertility or uterine preservation. Second, placental invasion is estimated to be so severe that cesarean-hysterectomy is considered exceptionally morbid. However, there are many factors involved in determining the appropriate management strategy, and neither of the two previous considerations may apply. We suggest that the range of options for PAS management be explained to all individuals with an antenatal PAS diagnosis, including a discussion of the local medical center's capabilities and comfort with each approach. For individuals living a large distance from a tertiary care center, conservative management may be more complex. In these circumstances, shared decision-making should involve the pregnant individual, PAS expert, and local obstetrician. If the local hospital does not have a blood bank or interventional radiology, the individual may move closer to the tertiary care center for 1–2 months of postpartum care following conservative management. For individuals who anticipate difficulty with postpartum follow-up or insurance loss, cesarean-hysterectomy is a definitive treatment that does not typically require extensive follow-up. This option may therefore be preferred. Objective factors such as the pregnant individual's age or parity are less important than their desires. Important factors such as quality of life implications, tolerance for possible emergency circumstances, sexual function, and psychological status should be discussed using a patient-centered approach to guide surgical planning [7•, 32•]. Individuals planning for conservative management are extensively counseled regarding the possibility of conversion to cesarean-hysterectomy during delivery or hysterectomy during the postpartum period in the setting of complications. Independent of individual

preferences and demographics, cesarean-hysterectomy is recommended for individuals with severe pain, significant bleeding, coagulopathy, or hemodynamic instability during the antepartum period.

Controversy exists if conservative management should be recommended in cases of severe placental invasion such as placenta percreta. In these cases, maternal morbidity is significant with cesarean-hysterectomy due to the dense, invasive, and aberrant vascular network of arterio-venous anastomoses driven by placental angiogenic factors. This neovascularization makes hemostasis and visualization difficult when dissecting the uterus from its pedicles and the bladder. Some experts argue that placenta percreta is the only case in which conservative management will be successful as no spontaneous placental separation will cause postpartum hemorrhage. However, multiple studies have shown that conservative management is less likely to be successful with greater severity of PAS. For example, in multiple case series, successful uterine preservation with conservative management was achieved between 14–56% of individuals with placental percreta, a lower proportion than individuals with less severe PAS [18, 72–74]. Maternal morbidity is greater with placenta percreta when compared to less severe forms of PAS, but this is demonstrated in both cesarean-hysterectomy and conservative management [24•, 31••, 75•]. No study has directly compared cesarean-hysterectomy to conservative management in key differences that show an escalation in maternal morbidity and mortality with placenta percreta over accreta [76•]. Thus, pregnant individuals with placenta percreta should be advised that it is unknown whether conservative management is safer than cesarean-hysterectomy, and we do not counsel these individuals toward a specific management strategy. However, disease severity and its implications should be reviewed regardless of management strategy selected.

Delivery Planning and Resource Requirements

Delivery outcomes among individuals with PAS are superior when pregnant individuals are cared for by a multidisciplinary, experienced PAS team [77, 78]. The resources and team needed are described in Fitzgerald et al. [79•]. Delivery and postpartum care in conservative management of PAS require the same resources as planned cesarean-hysterectomy. Medical centers without the resources to care for individuals with PAS should establish effective referral patterns to suitably resourced obstetric care centers when PAS is suspected [69•, 80]. In cases where relocation is not possible, emergency medical services must be available for prompt transportation of individuals with PAS in need of timely evaluation and treatment during the antepartum and postpartum periods [81]. If a center does not offer conservative management of PAS, individuals who desire this strategy should be referred to experienced centers.

Routine elements of postpartum care are incorporated into the care of conservatively managed individuals with PAS. There are no published data on ability to breastfeed or any potential risks or benefits of breastfeeding with conservative management of PAS, but many individuals can successfully breastfeed. All efforts should be made to limit mother-infant separation. When the mother and infant are physically separated, remote interactions can provide a limited bonding experience for individuals and prevent postpartum depression [79•]. While no published framework exists to address perinatal mental health in individuals with PAS, social workers and support groups can be utilized to combat birth trauma, anxiety, and negative psychological outcomes associated with the morbidity and isolation of conservative management [64•, 82]. Case managers may need to provide financial assistance with hospitalization and postpartum transportation costs as well as any home medical supplies and services. Lastly, educational materials must include a detailed outline of the postpartum surveillance plan, self-care instructions, expected symptoms and signs, alarming observations, and emergency contact information for urgent inquires.

Unsuspected PAS

When a clinician encounters an unsuspected PAS at the time of delivery in an unexperienced obstetric care center, conservative management can be a safe option. In this scenario, the quantity of bleeding and pregnant individual's stability dictate their candidacy for conservative management. A flow diagram in Einerson et al. suggests one decision-making strategy for the unsuspected PAS diagnosed at delivery [8••]. If the individual is unstable or has heavy bleeding, an immediate cesarean-hysterectomy must be performed. However, if the individual is hemodynamically stable without heavy bleeding, the placenta can be left in situ with or without infant delivery. The individual can subsequently be transported to a referral center for further management.

Subsequent Pregnancy Outcomes

Fertility rates for individuals with PAS appear unaffected after conservative management. In several small and large cohort studies, 83–89% of individuals desiring another pregnancy after conservative PAS management were able to achieve a subsequent pregnancy with a mean time to conception of 17.3 months (range: 2–48 months) [32•, 45, 83, 84]. Following conception, all pregnancies carried beyond the first trimester resulted in delivery of a healthy infant

Table 2 Statements from guidelines on conservative management of PAS disorders [6•]

	CNGOF 2016 [91]	ACOG/SMFM 2018 [90]	IS-PAS 2019 [19]	RCOG 2019 [92]	SOGC 2019 [93]	RANZOG 2023 [94]
Recommendation	Conservative treatment is possible for placenta accreta in women who want such treatment after information about the risk of recurrence and the potential complications associated with it	Conservative management should be considered only for carefully selected cases of placenta accreta spectrum after detailed counseling about the risks, uncertain benefits, and efficacy and should be considered investigational	Expectant management is an appropriate management strategy for women wishing to preserve their fertility and in cases where hysterectomy is considered to be at very high risk of surgical complications. If women choose this option, they must be appropriately counseled, including being informed that there is a 6% risk of severe maternal morbidity	Elective peripartum hysterectomy may be unacceptable to women desiring uterine preservation or considered inappropriate by the surgical team. In such cases, leaving the placenta in situ should be considered	Classical cesarean section and non-removal of the invasive placenta is an acceptable method of delivery but is associated with a protracted course of recovery and a persistent risk of hysterectomy	Conservative management may be considered as an alternative to planned cesarean-hysterectomy for appropriately counseled women who are willing to follow advice regarding the need for close surveillance. Services caring for women with conservative management must have the capacity to manage potential complications including the need for emergency hysterectomy and massive transfusion

CNGOF Collège National des Gynécologues et Obstétriciens Français, *ACOG/SMFM* American College of Obstetricians and Gynecologists/Society for Maternal–Fetal Medicine, *IS-PAS* International Society for Placenta Accreta Spectrum, *RCOG* Royal College of Obstetricians and Gynaecologists, *SOGC* Society of Obstetricians and Gynaecologists of Canada, *RANZOG* Royal Australian and New Zealand College of Obstetricians and Gynaecologists

after 34 weeks of gestation [45]. However, in the smaller cohort studies, additional management strategies were utilized that included uterine artery embolization, methotrexate administration, hysteroscopic resection of retained tissue, and uterine reconstruction. These interventions in addition to the lack of follow-up, histological confirmation, and corresponding PAS severity make true fertility rates difficult to estimate when only considering conservative PAS management. In addition, these small, retrospective studies that rely on an individual's adherence and engagement are subject to selection and reporting biases in evaluating fertility rates. To date, insufficient evidence exists to guide if additional interventions are needed with PAS classification to optimize fertility preservation following conservative management.

In two small cohort studies, PAS recurrence risk following conservative management has been estimated to range from 22–29% in individuals who delivered after 34 weeks of gestation [45, 84]. This risk may be higher when compared to individuals who undergo uterine resection-reconstruction at the time of delivery with a recurrence rate of 5–23% [85•, 86–89•]. However, these outcomes may also be influenced by the same limitations in estimating fertility rates. Caution should be exercised when discussing future pregnancy risks and outcomes with pregnant individuals.

Societal Guidelines

Table 2 contrasts current national and international guidelines on the conservative management of PAS. Notably, ACOG and the Society for Maternal–Fetal Medicine (SMFM) uniquely categorize conservative management as investigational [90]. As preliminary data support conservative management as a viable option, a more permissive stance by ACOG and SMFM could foster openness among physicians to explore PAS management alternatives beyond cesarean-hysterectomy [6•].

Conclusion

Cesarean-hysterectomy is associated with significant maternal morbidity, and conservative management is a reasonable alternative. The resources needed for both are similar, though each has unique risks and benefits. The optimal management strategy for PAS is yet to be defined, though certainly involves individualized shared decision-making.

Author Contributions Responsibilities: Beth Pineles is responsible for the conception of this article. Gabriel Arenas and Jacqueline Thompson are responsible for completing the literature search, data analysis, and manuscript draft. All authors are responsible for critically revising the manuscript.

Funding No funding was obtained in the production of this review.

Compliance with Ethical Standards

Ethical Standards No ethics board approval was requested, as the data were collected from published articles.

Conflict of Interest The authors have no relevant financial or non-financial interests to disclose.

Human and Animal Rights and Informed Consent This article contains only previously published studies or data from human subjects. No original data was obtained or included in the production of this review.

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- • Of importance
- •• Of major importance

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