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FIGO GUIDELINES

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FIGO consensus guidelines on placenta accreta spectrum disorders: Conservative management☆,★

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1 | INTRODUCTION

Conservative management of both abnormally adherent (placenta creta) and invasive placenta (placenta increta and percreta) defines all procedures that aim to avoid peripartum hysterectomy and its related morbidity and consequences. Four different primary methods of conservative management have been described in the international literature: (1) the extirpative technique (manual removal of the placenta); (2) leaving the placenta in situ or the expectant approach; (3) one-step conservative surgery (removal of the accreta area); and (4) the Triple-P procedure (suturing around the accreta area after resection). These methods have been used alone or in combination and in many cases with additional procedures such as those proposed by interventional radiology.

The main aim of leaving the placenta in situ versus the extirpative method is essentially to attempt to decrease the risks of severe maternal morbidity during cesarean delivery.[1–4] Forcibly removing an invasive placenta—with placental villi that have invaded the deep uterine vasculature[5]—increases the risks of massive obstetric hemorrhage and the need for salvation hysterectomy. Uncontrolled bleeding will lead to coagulopathy and will also complicate the surgical procedure, increasing the risk of injuries mainly to the bladder and ureters and their possible long-term complications such as vesicouterine fistula.[1–4] Successful conservative management strategies will also preserve fertility and thus reduce the impact on a woman's societal status and self-esteem associated with the loss of her uterus.

The purpose of this chapter is to assist obstetrician-gynecologists in selecting the most appropriate conservative treatment option to manage women with the different types of placenta accreta spectrum (PAS) disorders according to their individual need and the local expertise of the healthcare team. Since histopathological confirmation of adherent or invasive placentation is rarely available in most cases of conservative management and few authors provide detailed clinical information on the differential diagnosis between retained placenta and abnormally adherent placenta or the depth and lateral extension of accreta placentation, we use the term PAS disorders to describe both adherent and invasive placentation. When available we refer to the different depth of PAS disorders, i.e. creta, increta, and percreta.

2 | THE EXTIRPATIVE TECHNIQUE

This procedure consists of forcibly removing the placenta manually in an attempt to empty the uterus at delivery. The aim of this approach is to avoid leaving retained placental tissues in the uterine cavity and it is recommended by established worldwide guidelines as one of the first steps to manage postpartum hemorrhage.[6–13] However, in cases of PAS disorders, this procedure often results in massive obstetric hemorrhage and,

overall, not disturbing the accreta portion of the placenta is associated with more than a 50% reduction in blood loss and need for transfusions.[13]

A retrospective study comparing two consecutive periods of PAS disorder management in a single center found a reduction in the mean amount of red blood cells transfused, disseminated intravascular coagulation, hysterectomy rates, and secondary maternal infection during the second period when the placenta was left in situ compared with the first period when the placenta was always removed manually.[14] PAS disorders were diagnosed in the 51 cases included in this study using the following clinical criteria:

1. Manual removal of the placenta partially or totally impossible and with no cleavage plane between all or part of the placenta and uterus.
2. Prenatal diagnosis of accreta placentation, confirmed by the failure of gentle attempts to remove it during the third stage of labor.
3. Evidence of invasive placental tissue at the time of surgery.
4. Histologic confirmation of PAS disorders on a hysterectomy specimen.

Overall, most experts in the management of PAS disorders consider that attempts at manual removal of the placenta should be avoided in cases of planned cesarean hysterectomy.[15–21] In women presenting with risk factors for abnormally invasive placenta (placenta previa and multiple prior cesarean deliveries) but no suspicion of PAS disorders on prenatal ultrasound (false-negative), surgeons performing the cesarean delivery should not attempt to manually remove the placenta when the clinical signs suggest PAS disorders and/or there are unusual or unexplained difficulties at delivering the placenta. Within this context, new epidemiological data are needed to better evaluate the numbers of false-negative and false-positive cases of PAS disorders in the general obstetric population. In particular, there is a need for data that differentiate between adherent and invasive PAS.

3 | "LEAVING THE PLACENTA IN SITU" APPROACH

This approach consists of leaving the placenta in situ and waiting for its complete spontaneous resorption. It was initially called the "conservative treatment of placenta accreta".[19] As other conservative approaches have since been described, it is more accurate to use the terms "leaving the placenta in situ approach" or "expectant management".[20] This approach is based on the following evidence-based clinical concepts[18–21]:

1. Cesarean hysterectomy is considered the gold standard treatment for invasive accreta but it remains associated with high rates (40%–50%) of severe maternal morbidity and, in cases of placenta percreta, the mortality rates can be as high as 7% owing to damage to pelvic organs and vasculature.
2. The extirpative method is associated with severe maternal morbidity because it leaves, within the myometrium, placental tissues connected to large feeding vessels, which are responsible for uncontrolled massive obstetric hemorrhage.

By leaving a placenta accreta in situ after the delivery of the fetus, one can expect a progressive decrease in blood circulation within the uterus, parametrium, and the placenta. This will result in secondary necrosis of the villous tissue and theoretically the placenta should progressively detach itself from the uterus and the percreta villi from the adjacent pelvic organs.

Two separate surveys from the Society for Maternal–Fetal Medicine (SMFM)[22,23] reported that 14.9% of practitioners would attempt to leave the placenta in situ in a hemodynamically stable patient and 32% had attempted conservative expectant management for PAS disorders. In an older survey on the preferences for surgical versus conservative therapy in cases of placenta percreta, it was found that when adjacent pelvic organs such as the bladder and bowel are involved, the majority of members of the Society of Perinatal Obstetricians, with and without recent experience in the management of PAS disorders, opt for conservative management (69% and 70%, respectively) compared with 31% when the accreta villous tissue is confined to the uterus (creta or increta).[21]

3.1 | Practical issues

In cases of invasive PAS disorders diagnosed prenatally, the exact position of the placenta should be determined by preoperative ultrasound and the required surgical equipment for an emergent hysterectomy should available in the operating theatre. A low transverse skin incision allowing access to the lower half of the uterus can be performed if the upper margin of the anterior aspect of the placenta does not rise into the upper segment of the uterus. If the placenta is anterior and extending toward the level of the umbilicus, a midline skin incision may be needed to allow for a high upper-segment transverse uterine incision above the upper border of the placenta. The opening of the uterus should be by a transverse incision at a distance from the placental bed.

After delivery of the fetus, and only if there is no clinical evidence of percreta placentation (i.e. no placental tissue seen invading through the surface of the uterus), the surgeon may carefully attempt to remove the placenta by a controlled cord traction and the use of uterotonics. Failure to do so suggests the diagnosis of a PAS disorder and in these cases, the cord should be cut close to its placental insertion and the uterine cavity should be closed. Postoperative antibiotic therapy is usually administered prophylactically to minimize the risk of infection.

A literature review performed up to 2007, including 48 case reports describing the outcome of 60 women presenting with PAS disorders and managed by leaving the placenta in situ, found that of the 26 women managed without the use of additional therapies, 22 (85%) had a favorable outcome.[24] Expectant management failed in 4 (15%) cases and secondary hysterectomy had to be performed owing to massive obstetric hemorrhage or infection.[24]

A French multicenter retrospective study of 167 cases of PAS disorders managed in 40 teaching hospitals evaluated the maternal

outcome after conservative treatment and found that 25 (63%) of the centers reported to have used conservative treatment for PAS disorders at least once.[2] Conservative management in cases of PAS disorders was defined by the decision of the obstetrician to leave the placenta partially or totally in situ, with no attempt to remove it forcibly. In 59% of the cases the placenta was left partially in situ and in 41% it was left completely in situ (Table 1). The overall success rate of uterine preservation was 78% (95% CI, 71%–84%) and severe maternal morbidity including sepsis, septic shock, peritonitis, uterine necrosis, postpartum uterine rupture, fistula, injury to adjacent organs, acute pulmonary edema, acute renal failure, deep vein thrombophlebitis or pulmonary embolism, or maternal death was reported in 10 (6%) cases.[2] There was one maternal death due to multiorgan failure and septic shock, following the additional injection of methotrexate in the umbilical cord. Other rare morbidities including fistula and arteriovenous fistula formation were also reported in this series and by other authors.[25–27] An empty uterus was obtained spontaneously in 75% of cases after a median of 13.5 weeks (range, 4–60 weeks).[2] The results of this large study suggest that it is possible for centers with limited experience in conservative treatment of PAS disorders to attempt to preserve the uterus by leaving the placenta in situ, but it is essential that these centers have emergency access to blood products, obstetric anesthesia, interventional radiology, urology, and gynecological oncology expertise. The lack of data on the depth of villous invasion in most the cases included in this study does not allow the standardization of the management approach.

There are limited data on the conservative management of placenta percreta. A small series of three cases of placenta percreta and review of 57 cases from the literature found that when managed conservatively with the placenta left in situ, hysterectomy can be avoided in 60% of cases.[28] However, 42% of these cases had major complications including sepsis, coagulopathy, hemorrhage, pulmonary embolism, fistula, and arteriovenous malformation. In another review, in 36 cases of placenta percreta managed by leaving the placenta in situ, delayed secondary hysterectomy was required in 58% of cases.[27] In the French national study, there were 18 cases of placenta percreta where the placenta was left in situ.[2] Conservative treatment was successful in 10 (55.6%) cases but severe maternal morbidity was observed in 3 (16.7%) cases. Of the eight cases of placenta percreta with bladder involvement, conservative treatment was successful in 6 (75%) cases but severe maternal morbidity occurred in 2 (25%) cases.[2]

Overall, these data suggest that leaving the placenta in situ may be an option for women who desire to preserve their fertility and agree to close follow-up in centers with adequate expertise.[2,16–21]

3.2 | Additional procedures

Additional procedures (i.e. embolization or vessel ligation, temporal internal iliac balloon occlusion, methotrexate, hysteroscopic resection of retained tissues) have been used in a conservative approach with the placenta left in situ to decrease morbidity or to accelerate placental resorption.[19] There are no randomized controlled trials comparing

TABLE 1 Maternal morbidity after conservative treatment for placenta accreta spectrum (PAS) disorders.[a]

Characteristics	PAS disorders including percreta No. (%)
Placenta left in situ	167 (100)
Partially	99 (59.3)
Entirely	68 (40.7)
Primary postpartum hemorrhage	86 (51.5)
No additional uterine devascularization procedure	58 (34.7)
Additional uterine devascularization procedure	109 (65.3)
Pelvic arterial embolization	62 (37.1)
Vessel ligation	45 (26.9)
Stepwise uterine devascularization	15 (9.0)
Hypogastric artery ligation	23 (13.8)
Stepwise uterine devascularization and hypogastric artery ligation	7 (4.2)
Uterine compression suture	16 (9.6)
Balloon catheter occlusion	0
Methotrexate administration	21 (12.6)
Primary hysterectomy	18 (10.8)
Cause of primary hysterectomy	
Primary postpartum hemorrhage	18/18 (100)
Postpartum prophylactic antibiotic therapy >5 d	54 (32.3)
Transfusion patients	70 (41.9)
Units of packed red blood cells transfused >5	25 (15.0)
Transfer to intensive care unit	43 (25.7)
Infection	47 (28.1)
Septic shock	1 (0.6)
Sepsis	7 (4.2)
Vesicouterine fistula	1 (0.6)
Uterine necrosis	2 (1.2)
Deep vein thrombophlebitis or pulmonary embolism	4 (2.4)
Secondary postpartum hemorrhage	18 (10.8)
Delayed hysterectomy	18 (10.8)
Median interval from delivery to delayed hysterectomy, d	22 (9–45)
Cause of delayed hysterectomy	
Secondary postpartum hemorrhage	8/18 (44.4)
Sepsis	2/18 (11.1)
Secondary postpartum hemorrhage and sepsis	3/18 (16.7)
Vesicouterine fistula	1/18 (5.6)
Uterine necrosis and sepsis[d]	2/18 (11.1)
Arteriovenous malformation	1/18 (5.6)
Maternal request	1/18 (5.6)
Death	1 (0.6)
Success of conservative treatment	131 (78.4)
Severe maternal morbidity	10 (6.0)

[a]Modified from Sentilhes et al.[2]

these different additional procedures and the quality of the evidence varies according to the type of procedure used.

3.2.1 | Gentle attempted removal of the placenta

In case of false-positive prenatal diagnosis with no clinical evidence of PAS disorders at cesarean delivery, gentle attempted removal of the placenta can be tried. In cases of PAS disorders visibly limited to a small portion of the uterine wall, it is sometimes possible to remove the "non-accreta" portion of the placenta, thus reducing the volume of villous tissue left in situ.[19] Overall, the main risk of this strategy is the risk of massive obstetric hemorrhage and the need for emergent hysterectomy if the placenta is accreta; thus, this can only be attempted if a multidisciplinary team is available for an emergent hysterectomy.

3.2.2 | Methotrexate adjuvant treatment

Some authors have proposed the use of methotrexate to hasten placental resolution.[29] Only case reports and small case series with no control group have been reported.[24] A recent observational case series including 24 women with PAS disorders left in situ after birth and treated with methotrexate reported placental delivery in 33.3% of the cases (spontaneously in 55% and 45% by means of dilatation and curettage).[30] The low rate of trophoblastic cell turnover compared with that in early pregnancy indicates a much lower efficacy of methotrexate in late compared with early pregnancy. In addition, methotrexate exposes the patient to the risk of neutropenia or medullar aplasia and this has been reported even after a single dose for treatment of ectopic pregnancy.[31] These adverse effects can precipitate other possible complications, such as secondary infection of a placenta left in situ.[2]

In women with a placenta in situ who are successfully treated with methotrexate, the beta-human chorionic gonadotropin (β-hCG) levels and Doppler vascular resistance indices of the uteroplacental arterial circulation decrease faster than in those with treatment failure.[30] An earlier systematic review of different uterus preserving treatment modalities in 16 women with PAS disorders found that methotrexate therapy is associated with a low rate (6%) of secondary hysterectomy, although the number of cases reviewed was low.[32] The authors also reported subsequent menstruation in four out of five cases (80%) and a subsequent pregnancy in one out of two cases (50%).[32] One case of maternal death was reported in the French national survey[2] and disseminated intravascular coagulation may develop requiring a secondary hysterectomy.[33] Overall, the use of methotrexate is not recommended until further evidence is available on its efficacy and safety.

3.2.3 | Preventive surgical or radiological uterine devascularization

There are also very limited data on the use of these adjuvant techniques.[34–44] Preventive devascularization can be achieved by surgical or interventional radiology procedures also used in the management of severe postpartum hemorrhage, such as stepwise uterine surgical devascularization, bilateral uterine or hypogastric artery surgical ligation, iliac artery embolization, or balloon occlusion. Embolization before performing hysterectomy may reduce the risk of intraoperative blood loss[36] and prophylactic devascularization may prevent the occurrence of secondary hemorrhage[37] and could also accelerate placental resorption.[38] Overall, these uterine-sparing procedures seem to be less effective in cases of PAS disorders.[34,35]

A systematic review including 177 cases of PAS disorders reported success rates of 90% for arterial embolization, with secondary hysterectomy necessary in only 11.3%.[39] In the remaining 85 women, subsequent menstruation occurred in 87% and three women had a subsequent pregnancy. The indications for embolization and the depth of villous invasion are not accurately reported by the authors, limiting the interpretation of the data. This technique is also associated with significant maternal morbidity.[2,35]

The value of prophylactic placement of balloon catheters in the iliac arteries in cases of PAS disorders is even more controversial, mainly owing to the higher risks of complications than with embolization. In particular, there are two case reports, one of a popliteal and one of an external iliac arterial thrombus,[40,41] a case of iliac artery rupture,[42] and a case of ischemic nerve injury attributable to iliac artery thrombosis complicating common iliac balloon catheterization at cesarean hysterectomy.

A recent single-institution observational cohort series of 45 cases of PAS disorders reported the use of prophylactic lower abdominal aorta balloon occlusion and found a reduced need for blood transfusion.[43] One of the cases was complicated by lower extremity arterial thrombosis and another by ischemic injury to the femoral nerve. A small randomized controlled trial of women presenting with a prenatal diagnosis of PAS disorders was recently published.[44] Women were randomized to either preoperative prophylactic balloon catheters (n=13) or to a control group (n=14). No difference was observed for the number of women with blood loss greater than 2500 mL, number of plasma products transfused, duration of surgery, peripartum complications, and hospitalization length. Reversible adverse effects related to prophylactic balloon catheter insertion were observed in 2 of 13 (15.4%) cases (leg pain and weakness without swelling in one case and buttock claudication and abdominal pain in the other).[44] Larger studies and randomized controlled trials are essential to demonstrate the safety and efficacy of prophylactic bilateral iliac balloon occlusion before this technique can be offered in the management of PAS disorders.

3.2.4 | Systematic hysteroscopic resection of retained accreta tissue

In a small series of 23 women with PAS disorders with the placenta left in situ, 12 hysteroscopies were performed under ultrasound guidance owing to pain and/or bleeding with retained tissues.[45] The use of bipolar energy was limited to avoid any potential uterine perforation. The median size of the retained placenta was 54 mm (13–110 mm). No complication occurred. Complete removal (11/12) was achieved after one, two, and three hysteroscopic procedures in 5 (41.7%), 2 (16.7%), and 4 (33.3%) cases, respectively. These results suggest that hysteroscopic resection could shorten the recovery time without major adverse effects. However, in this series all women were

symptomatic, thus the role of systematic hysteroscopic resection in asymptomatic women remains to be determined.

High-intensity focused ultrasound (HIFU) is an ultrasound heat technique used in the management of prostate cancer. HIFU has recently been used in the treatment of PAS disorders after vaginal delivery, but its safety and efficiency remain to be demonstrated in larger prospective trials.[46] The study included 12 women with PAS disorders. The average period of residual placental involution was 36.9 days. HIFU treatment did not increase the risk of infection or hemorrhage and no patient required hysterectomy; however, the authors did not include histopathology data, and thus one can assume that most if not all of their cases were of placenta creta and/or of placental retention.

3.3 | Monitoring of leaving the placenta in situ approach

The pattern of follow-up after leaving the placenta in situ in cases of PAS disorders is not supported by randomized controlled trials. The residual villous tissue in the uterine wall may require up to 6 months to be completely absorbed.[31] In rare cases, a coagulopathy or septicemia may develop, requiring an emergent secondary hysterectomy.[33] Measuring serum β-hCG on a weekly basis to check it falls continuously can reassure to some extent, but low levels do not guarantee complete placental resorption and so this should be supplemented by expert ultrasound imaging. There is insufficient evidence to recommend the use of MRI.[38] Subsequent management usually requires weekly follow-up visits during the first 2 months and then in the absence of complications, monthly visits until complete resorption of the placenta. The follow-up consultation should include a clinical examination (bleeding, temperature, pelvic pain), pelvic ultrasound (size of retained tissue), and laboratory tests for infection (hemoglobin and leukocytes count, vaginal sample for bacteriological analysis).[2]

3.4 | Long-term obstetric and fertility outcomes

Successful conservative treatment for PAS disorders does not appear to compromise subsequent fertility or obstetric outcome, but data are limited. Pregnancies following prior PAS disorders are at increased risk for adverse maternal outcomes including recurrent PAS disorders, uterine rupture, postpartum hemorrhage, and peripartum hysterectomy.[47–49] Overall, the risk of recurrence of PAS disorders ranges between 22%[50] and 29%,[49] whereas the risk of early postpartum hemorrhage ranges between 8.6%[50] and 19%.[49] Long-term complications also include intrauterine adhesions and secondary amenorrhea,[49] which both have a direct effect on fertility.

All women included in the French national retrospective study who did not undergo a hysterectomy were contacted to evaluate their fertility and pregnancy outcomes after successful expectant management.[49] Follow-up data were available for 96 of the 131 women (73.3%) included in the study. Eight (8.3%) women had severe intrauterine adhesions and were amenorrheic. Of the 27 women who wanted more children, 24 (88.9%) women had 34 pregnancies with a mean time to conception of 17.3 months (range, 2–48 months). All 21 deliveries resulted in healthy babies born after 34 weeks of gestation. PAS disorders recurred in 6 of 21 cases (28.6%) and were associated with placenta previa in four cases. Postpartum hemorrhage occurred in 4 (19%) cases, related to accreta placentation in three and to uterine atony in one. These results indicate that pregnancy is possible in most cases of successful conservative management, but is associated with an almost 30% risk of PAS disorders in subsequent pregnancies.[49]

4 | ALTERNATIVE CONSERVATIVE SURGICAL PROCEDURES

4.1 | One-step conservative surgery

This surgical procedure has been described primarily by one author.[3,51,52] It consists of resecting the invasive accreta area (partial myometrial resection) followed by immediate uterine reconstruction and bladder reinforcement.[51] This strategy aims to combine the advantages of both the "leaving in situ approach" of preserving the uterus and cesarean hysterectomy with minimal risk of secondary bleeding or infection. The main steps in this uterine-sparing technique can be performed via a modified Pfannenstiel or midline incision (Box 1).[52] It is advantageous for low- and middle-income countries where expensive additional treatments such as interventional radiology may not be available.

In a cohort study of 68 women presenting with placental invasion of the adjacent organs including invasion of the posterior upper bladder section (n=46; group 1) or of the posterior lower vesical section (n=22; group 2), uterine preservation was achieved in 44 out of 46 (95.7%) and 6 out of 22 (27.3%) cases, respectively.[3] The indications for the 18 hysterectomies were segmental circumferential rupture greater than 50% (n=13), coagulopathy (n=2), infection (n=1), and uncontrolled hemodynamic instability (n=2). Among the 50 women with uterine preservation, follow-up was available for 42 patients. A normal menstrual cycle returned between 3 and 16 months. Ten women had another uneventful pregnancy and delivery with no recurrence of PAS disorders.

A recent prospective study of 71 patients presenting with placenta percreta evaluated a variation of the stepwise approach (Box 2) and

Box 1 One-step conservative surgery approach for placenta accreta spectrum (PAS) disorders.[a]

1. Vascular disconnection of newly-formed (feeder) vessels and the separation of invaded uterine tissues from invaded vesical tissues.
2. Upper-segmental hysterotomy and delivery of the fetus.
3. Resection of all invaded myometrial tissue and the entire placenta in one piece with previous local vascular control.
4. Surgical procedures for hemostasis.
5. Myometrial reconstruction in two planes.
6. Bladder repair if necessary.

[a] Modified from Palacios-Jaraquemada.[52]

Box 2 Stepwise surgical approach for placenta accreta spectrum (PAS) disorders.[a]

1. Combined early intravenous uterotonics just before delivery of the fetus.
2. Transverse "high" uterine incision at the upper border of the placenta without cutting through the placenta.
3. Fetal delivery.
4. The uterus is exteriorized and compressed against the symphysis pubis by assistant (transient bilateral kink of uterine arteries).
5. Bilateral anterior division of internal iliac artery ligations.
6. Placental extraction (delayed after pelvic devascularization).
7. Proper identification of lower uterine segment by index and ring fingers after identification of internal cervical os by middle finger of left hand.
8. Repair of uterine incision.

[a] Modified from Shabana et al.[53]

found that it was successful in controlling the bleeding and preserving the uterus in 65 (91.5%) of the cases.[53] Hemostasis was achieved firstly by retrovesical ligature of vesicouterine vessels (upper pedicle) and secondly by stitch occlusion of the colpo-uterine vessels in the cervical–vaginal junction (lower pedicle). Selective devascularization was only applied to the vessels that provide irrigation to the invaded area (pelvis subperitoneal pedicles) avoiding any procedure (ligature or embolization) around the uterine arteries. Overall, this procedure may be less reproducible than other approaches for conservative treatment, mainly because efficient hemostasis is operator dependent. Removal of the area completely invaded by placental tissue and uterine reconstruction using surrounding healthy myometrial tissues results in a low rate of recurrence (2/108 cases) in future pregnancies.[54]

4.2 | The Triple-P procedure

A novel uterine-sparing procedure for PAS disorders called the "Triple-P procedure" was recently proposed.[4,55] The aim of this procedure is to avoid incising through the vascular placental venous sinuses, and to excise the myometrium with PAS disorder tissue and to reconstitute the uterine defect. The main steps of this procedure include: (1) perioperative placental ultrasound localization of the superior edge of the placenta; (2) pelvic devascularization involving preoperative placement of intra-arterial balloon catheters (anterior division of the internal iliac arteries); and (3) no attempt to remove the entire placenta with large myometrial excision and uterine repair. If the posterior wall of the bladder is involved, the placental tissue invading the bladder is left in situ to avoid cystotomy.

A comparison of two periods (i.e. before implementation of the Triple-P procedure [n=11] and after [n=19]) showed no difference in the estimated mean blood loss and rate of transfusion; however, the rates of postpartum hemorrhage and hysterectomy were lower in the Triple-P procedure group.[4] Larger studies are needed to demonstrate the safety and efficacy of this technique.

4.3 | Tamponade techniques

Small case series have also reported the successful use of compression sutures,[56–60] using the cervix as a natural tamponade by inverting it into the uterine cavity and suturing the anterior and/or the posterior cervical lips into the anterior and/or posterior walls of the lower uterine segment.[61] The latter technique of cervical inversion was successful in stopping bleeding in 38 out of 40 patients. The mean time needed to perform the technique was 5.4 ± 0.6 minutes. The complications observed included bladder injury in the two patients who underwent hysterectomy and wound infection in one patient.

TABLE 2 Recommendations for conservative management of placenta accreta spectrum (PAS) disorders.

Recommendations	Resource settings	Quality of evidence and strength of recommendation
Leaving the placenta in situ is an option for women who desire to preserve their fertility and agree to continuous long-term monitoring in centers with adequate expertise	High	Moderate and Strong
The extirpative approach or forcible manual removal of the placenta should be abandoned	All	High and Strong
When a conservative treatment is attempted in cases of PAS disorders diagnosed prenatally, the exact position of the placenta should be confirmed by a preoperative ultrasound and the equipment and expert surgical team should be on stand-by for an emergent hysterectomy	High	Moderate and Strong
After the delivery of the fetus, and only in cases with no clinical evidence of invasive PAS disorders, the surgeon may carefully attempt to remove the placenta by controlled cord traction and the use of uterotonics	All	Low and Strong
Postoperative antibiotic therapy (amoxicillin and clavulanic acid or clindamycin in case of penicillin allergy) should be administered prophylactically to minimize the risk of infection when the placenta is left in situ	High	Low and Weak
The use of methotrexate is not recommended until further evidence is available on its efficacy and safety	High	Moderate and Strong
Preventive surgical or radiological uterine devascularization is not recommended routinely	High	Low and Weak
There is insufficient evidence to recommend the use of magnetic resonance imaging and/or measuring serum β-hCG for the monitoring of conservative management cases	High	Low and Weak
Women who want another pregnancy should be advised that the recurrence risk of PAS disorders is high	All	High and Strong
The one-step conservative surgery is less reproducible than other conservative management approaches, mainly because the efficacy of hemostasis is operator dependent	High	Low and Weak

5 | RECOMMENDATIONS

Recommendations for conservative management of PAS disorders are given in Table 2.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

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