PLACENTA ACCRETA SPECTRUM DISORDERS (PAS) 2.0

Background

PAS disorders are an overarching term for placentas with abnormal adherence (accreta) or abnormal invasion as it penetrates through the decidua basalis into and through the myometrium (increta, percreta).

The recent increase in prevalence of PAS disorders is a consequence of the rise in caesarean deliveries over the last two decades and they are now almost an entirely iatrogenic condition hence every attempt must be made to ensure that the decision for a primary caesarean section is thoroughly thought through and absolutely indicated. Women should be informed that the incidence of PAS disorders increases with the number of previous caesarean deliveries (esp. if elective prelabour CS).

Link between number of previous caesarean sections and risk of placenta accreta, placenta praevia and hysterectomy

Number of Previous Caesarean Sections	Number of Women	Number of Women with Placenta Accreta	%	Chance of Placenta Accreta if Placenta Praevia	Number of Hysterectomies	%
0	6201	15	**0.24%**	**3%**	40	**0.65%**
1	15808	49	**0.31%**	**11%**	67	**0.42%**
2	6324	36	**0.57%**	**40%**	57	**0.90%**
3	1452	31	**2.13%**	**61%**	35	**2.40%**
4	258	6	**2.33%**	**67%**	9	**3.49%**
5	89	6	**6.74%**	**67%**	8	**8.99%**
Totals	30132	143			216	

Silver RM, Landon MB, Rouse DJ, Leveno KJ, Spong CY, Thom EA, et al.; National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Maternal morbidity associated with multiple repeat caesarean deliveries. Obstet Gynecol 2006;107:1226–32

PAS disorders have become a leading cause of peripartum hysterectomy, maternal morbidity and even mortality.

Maternal mortality and morbidity are reduced when women with PAS disorders, particularly the invasive forms (increta and percreta), deliver in a centre of excellence by a multidisciplinary care team with experience in managing the surgical risks and perioperative challenges presented by these disorders, the main risk being massive obstetric haemorrhage. Transfer to a centre of excellence, however, relies on both recognition of the women at risk of PAS disorders and on accurate prenatal diagnosis, which currently is not the case in more than half of the cases.

Classification (FIGO)

Grade 1: Abnormally adherent placenta (Adherenta or Accreta)

Clinical criteria

- At vaginal delivery
  - No separation with synthetic oxytocin and gentle controlled cord traction
  - Attempts at manual removal of the placenta results in heavy bleeding from the placenta implantation site requiring mechanical or surgical procedures
- If laparotomy is required (including for caesarean delivery)
  - Same as above
  - Macroscopically, the uterus shows no obvious distension over the placental bed (placental "bulge"), no placental tissue is seen invading through the surface of the uterus, and there is no or minimal neovascularity

Histological criteria of placental bed samples

- Extended areas of absent decidua between villous tissue and myometrium, with placental villi attached directly to the superficial myometrium on a hysterectomy specimen
- The diagnosis cannot be made on just delivered placental tissue nor on random biopsies of the placental bed

Grade 2: Abnormally invasive placenta (Increta)

Clinical criteria

- At laparotomy
  - Abnormal macroscopic findings over the placental bed: bluish/purple colouring, distension (placental "bulge")
  - Significant hypervascularity (dense tangled bed of vessels or multiple vessels running parallel craniocaudally in the uterine serosa)
  - No placental tissue invading through the uterine serosa
  - Gentle cord traction results in the uterus being pulled inwards without separation of the placenta ("dimple sign")

Histological criteria

- Hysterectomy specimen or partial myometrial resection of the increta area shows placental villi within the muscular fibers and sometimes in the lumen of the deep uterine vasculature (radial or arcuate arteries)

Grade 3: Abnormally invasive placenta (Percreta)

Grade 3a: Limited to the uterine serosa

Clinical criteria

- At laparotomy
  - Abnormal macroscopic findings on uterine serosal surface (as above) and placental tissue seen to be invading through the surface of the uterus
  - No invasion into any other organ, including the posterior wall of the bladder (a clear surgical plane can be identified between the bladder and uterus)

Histological criteria

- Hysterectomy specimen showing villous tissue within or breaching the uterine serosa

Grade 3b: With urinary bladder invasion

Critical criteria

- At laparotomy
  - Placental villi invading into the bladder but no other organs
  - Clear surgical plane cannot be identified between the bladder and uterus

Histological criteria

- Hysterectomy specimen showing villous tissue breaching the uterine serosa and invading the bladder wall tissue or urothelium

Grade 3c: With invasion of other pelvic tissue/organs

Clinical criteria

- At laparotomy
  - Placental villi invading into the broad ligament, vaginal wall, pelvic sidewall, or any other pelvic organ (with or without invasion of the bladder)

Histological criteria

- Hysterectomy specimen showing villous tissue breaching the uterine serosa and invading pelvic tissue/organs (with or without invasion of the bladder)

Screening and diagnosis

- The most described risk factor is a combination of previous caesarean delivery and placenta praevia.
- Others include: increasing age and parity, ART or previous uterine surgery, curettage or Ashermann syndrome.
- Women presenting with a caesarean scar pregnancy in the first trimester should be informed of the high risk of invasive placentation and/or major placenta praevia later in pregnancy (often requiring hysterectomy) and should be offered the option of terminating the pregnancy.
- All women with a previous caesarean delivery AND an anterior low-lying placenta (placental edge < 2cm from the internal cervical os after 16 weeks of gestation) or placenta praevia should be referred to a centre with expertise in the prenatal diagnosis of PAS disorders, preferably ultrasound experience.
- Ultrasonography is the first line for the diagnosis of PAS disorders and close attention should be paid to the location of the lower placental edge in relation to the internal os in all women, esp. those with a previous CS.
- MRI is not essential for making a prenatal diagnosis of suspected PAS disorders but may be useful in evaluating the pelvic extension of a placenta percreta or areas difficult to evaluate on ultrasound

Ultrasound imaging

The ultrasound signs observed for the diagnosis of PAS disorders should be described using standardized protocols

1. **First trimester:**

Caesarean scar pregnancy, with the gestational sac embedded in the lower uterine segment, at the site of a caesarean scar. There are often multiple irregular vascular spaces within the placental bed

2. **Second trimester:**

- Loss of normal hypoechoic zone between placenta and myometrium (good sensitivity so presence of a clear space excludes PAS)
- Decreased retroplacental myometrial thickness (< 1mm)
- Thinning or disruption of the uterine serosa-bladder interface
- Extension of placenta into myometrium, serosa or bladder
- Multiple vascular lacunae within the placenta
- Diffuse or turbulent lacunar blood flow
- Increased subplacental vascularity
- Gaps in myometrial blood flow
- Markedly dilated vessels over peripheral subplacental zone

MRI

- Dark intra-placental bands on T2-weighted imaging
- Abnormal bulging of the placenta or uterus
- Disruption of the zone between the uterus and placenta
- Abnormal, disorganised placental blood vessels

Antenatal management

- Extensive counselling (risks include, but are not limited to: preterm birth, massive obstetric haemorrhage, need for blood and blood product transfusion, need for hysterectomy and increased risk of adjacent organ trauma esp. bladder and ureters and anaesthetic risks) – Good note keeping is key!!!
- Optimise Hb to a minimum of 10g/dl
- Inpatient management as soon as one episode of APH (remember compression stockings and hydration to reduce VTE risk)
- Timing of delivery: Scheduled non-emergent delivery is preferred for women with PAS disorders as it is associated with a reduction in complications related to blood loss. This may justify planning delivery at 34-35 weeks for invasive forms of PAS to reduce the need for emergency surgery, while in accreta it may be safe to postpone until 37 weeks, esp. if no previous minor APH, no PPROM and no contractions; or be earlier if previous APH (consider BMZ)

Non-conservative surgical management of PAS disorders.

- Optimise Hb
- Schedule delivery in a Centre of Excellence with a
    - dedicated multidisciplinary team and care plan,
    - accessible 24/7
    - logistic support for access to blood products (availability of red blood cells, cryoprecipitate, fresh frozen plasma). At least 2 units of packed red blood cells should be available in the theatre and can be ordered on a returnable basis.
    - surgical expertise in complex pelvic surgery (incl. retroperitoneal dissection, ureterolysis, internal iliac artery ligation, ureteral stent placement, bowel resection, repair of vascular injury) – most experienced surgeon should operate
    - intensive care facilities (adult / neonatal),
    - senior obstetric anaesthetists
    - consider cell saver
- Primary elective caesarean hysterectomy is the safest and most practical option for most low- and middle-income countries.
- The exact position of the placenta should be confirmed by a preoperative ultrasound
- Patient in modified lithotomy position
- A midline skin incision should be considered for invasive PAS disorders and anterior low-lying placenta or previa accreta when the superior margin is outside the lower uterine segment.
- The uterine incision must avoid the entire placental bed
- Deliberate cystotomy and excision of involved bladder may be considered in cases of percreta involving the bladder
- In the absence of spontaneous placental separation, the placenta should be left in situ to minimize blood loss during planned immediate caesarean hysterectomy and uterotonics should not be used.
- Total hysterectomy with placenta in situ is the procedure of choice in cases of placenta previa increta or percreta.
- Tranexamic acid should be administered (1 g slow IV or 1000–1300 mg orally) immediately prior to or during caesarean delivery (after cord clamping) for PAS disorders.
- Options:
    - Preoperative ureteric stent placement can reduce the risk of unintentional urinary tract injury
    - The role of bilateral internal iliac artery ligation or balloon occlusion at the time of caesarean hysterectomy for PAS disorders is currently unclear.

Conservative management of PAS disorders.

- The extirpative approach or forcible manual removal of the placenta should be abandoned
- In cases of placenta percreta with extensive pelvic invasion, delayed hysterectomy (3-12 weeks later) with placenta in situ may be considered.
- Leaving the placenta in situ is an option for women who desire to preserve their fertility (but they should be counselled about a 22-29% recurrence risk of PAS disorders) and who

agree to continuous long-term monitoring in centres with adequate expertise and 24/7 access to the multidisciplinary team as major complications (bleeding, coagulopathy, sepsis) are common and may occur many weeks later.

- 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 incision must avoid the entire placental bed (be at least 2 cm away from the upper border of the placenta, classical incision)
- Equipment and expert surgical team should be on stand-by for an emergent hysterectomy.
- Focal central disease may be amenable to wedge resection, with complete removal of the placenta and repair of the uterus (Triple-P procedure)
- If the placenta is left in situ, the cord must be clamped close to the surface and the uterus closed.
- Postoperative antibiotic therapy (amoxicillin and clavulanic acid or clindamycin in case of penicillin allergy) should be administered prophylactically to minimize the risk of infection.
- The use of methotrexate is not recommended.
- Preventive surgical or radiological uterine devascularisation is not recommended routinely
- Postoperative follow-up: 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 but regular clinical and ultrasound review until full resolution is recommended

References

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Authorship

These guidelines were drafted by a clinical team from Mediclinic and were reviewed by a panel of experts from SASOG and the BetterObs clinical team in 2019 and revised by the scientific subcommittee of BetterObs in 2022. All attempts were made to ensure that the guidance provided is clinically safe, locally relevant and in line with current global and South African best practise. Succinctness was considered more important than comprehensiveness.

All guidelines must be used in conjunction with clinical evaluation and judgement; care must be individualised when appropriate. The writing team, reviewers and SASOG do not accept accountability for any untoward clinical, financial or other outcome related to the use of these documents. Comments are welcome and will be used at the time of next review.

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