Simplified conservative surgery for placenta accreta spectrum (PAS): an abnormally invasive placenta (AIP) case

Abdalla Mousa 1, Islam Tarek Elkhateb 1,2

DESCRIPTION
A 20-year-old woman, G3 F2 P0 A0 L1, with history of previous two caesarian sections (CSs), was referred to our centre at ±36 weeks of gestation for birth planning by conservative surgery, following the suspicion of placenta accreta spectrum (PAS) disorder by ultrasound (US). The patient had an uneventful pregnancy course, her history was unremarkable for any chronic or gestational-induced medical disorder, and she had no history of any other abdominal surgeries done but for the two CSs.

The patient was assessed at our outpatient clinic, she was evaluated and counselled by our team consisting of an imaging expert, consultant obstetrician, and gynaecologic oncology surgeon. US with colour Doppler confirmed the diagnosis of placenta previa (PP) anterior with features suggestive of abnormally invasive placenta (AIP), namely: loss of clear zone, abnormal placental lacunae, subplacental and uterovesical hypervascularity (figure 1).

The patient was prescribed a corticosteroids course to enhance fetal lung maturity and surgery was scheduled 2 days later. The patient signed a consent for CS hysterectomy in case of failed trial of conservative surgery, and we made our preparations for massive blood transfusion and urinary tract organs repair in case of massive haemorrhage or inadvertent injury.

The patient had a low midline incision followed by dissection in layers as the routine steps for any laparotomy. AIP was diagnosed surgically as the placenta was seen to invade through the uterine surface into the urinary bladder (figure 2).

We performed UB dissection through sectioning the vesicouterine fold followed by vascular disconnection of the neoformed vessels connecting AIP to the UB (video 1). Transverse uterine incision made just above the edge of the AIP (video 2), a late preterm male fetus was breech extracted, followed by exteriorisation of uterus. Uterine devascularisation made with ligation of both uterine arteries (UAs) at low level, then UAs with broad ligaments’ varicosities at a level 2 cm above the uterine incision, and finally anterior and posterior cervical wall control sutures were taken at the level of uterosacral ligaments (video 3). The AIP with the deficient and invaded segment of the uterine wall were resected en bloc (video 4), compression sutures were taken in the posterior uterine wall, (figure 4) and the uterine wall defect was repaired with myometrium reconstruction in two layers, using vicryl 1.0 sutures (figure 5). Summary of these steps is found in box 1.
Intraoperative, the estimated amount of blood loss was 1500 CC, the patient had 1 unit of packed red blood cells and fresh frozen plasma transfused. Preoperative haemoglobin was 11 g/L, while it was 9.7 g/L on day 1 postoperative. Intraperitoneal drain pooled only 200 CC by day 1 postoperative, then it was removed. 1 g of tranexamic acid, 100 μg of carbetocin and 2 g of first generation cephalosporin were administered intraoperative, and no iatrogenic injury to any organ happened. No postpartum haemorrhage, fever, ileus, urine retention, vesico-vaginal fistula, intensive care unit admission, wound infection or deep venous thrombosis occurred postoperative. Follow-up US on day 40 showed complete involution of uterus without significant uterine scar niche or intrauterine adhesions, which was confirmed by office hysteroscopy (figure 6). Histopathology examination of the part of placenta invading the uterine wall came back with the result that PAS is extensively infiltrating the uterine and UB walls (AIP degree of invasiveness) (figure 7). The patient resumed normal menses after breast weaning, she is currently on cyclic oral contraceptive pills, with no complaints.

PAS is a term that encompass AIP (placenta increta, placenta percreta) and placenta accreta. The incidence of PAS has risen significantly in the last decade, owing primarily to increased...
incidence of CSs. The major risk factor for PAS is PP implanted on a prior CS scar. The management modalities for PAS include radical management, expectant management with the ‘leaving the placenta in situ’ technique and follow-up, and conservative management with surgical resection of the invaded part of the uterine wall along with the PAS followed by uterine reconstruction (our case).

Radical management with CS hysterectomy remains the definitive treatment of PAS. However, it eliminates any future childbearing capacity, which is bothersome and psychologically traumatic for young and low parous women, especially those who live in communities where fertility is a very important function for women in their culture. Thus, expectant and conservative management were introduced into practice.

Though expectant management may be successful in up to 60%–93% of cases, it requires long and close follow-up and it is associated with 40%–50% risk of serious short-term and long-term morbidities, namely: bleeding, infection, fistula formation, secondary curettage, 58% risk of secondary hysterectomy up to 9 months postpartum, and high risk of recurrence of PAS, reaching up to 29%, in future pregnancies. This has led to limitations of its application in clinical practice.

Conservative management has the advantage of less long-term morbidities and recurrence rate than expectant management, and that it preserves the uterus for future fertility unlike radical management, while its major limitations are in the various techniques that have been described to date, and that some of them are yet missing sufficient studies or number of patients to assess their efficacy and safety.

In our case, we aim to clearly describe (in images and video) our simplified approach to conservative surgery for PAS, in the form of presentation of a PAS case who was successfully managed with our surgery in spite of preoperative radiological, intraoperative surgical, and postoperative histopathological diagnosis of AIP. In order to assess the safety and efficacy of our approach, further patients are being managed the same way at our unit. The outcomes of these cases, compared with the cases managed with CS hysterectomy before introducing our conservative surgery technique into practice and compared with the outcomes of other well-known conservative surgery techniques, will be published in a clinical study after doing number of cases sufficient for good statistical analysis.

Our patients are followed-up postoperative for the same outcomes aforementioned postoperative for this patient and are instructed to follow-up very early in the next pregnancy for US signs of placental pathology or malfunction, example: CS scar ectopic, PAS recurrence, preeclampsia, fetal growth restriction, retro-placental haemorrhage, gestational trophoblastic diseases, abortion, and low lying placenta. These outcomes will be published in our clinical study as well.

Our approach has common steps with well-known conservative surgery techniques described before; the main differences are essentially in the devascularisation step after fetal delivery, myometrial repair, and dealing with placenta in case of percreta degree of invasiveness (table 1). Our case clearly did not have a ‘uterine window’ in which the scar is dehiscent with the placenta visible directly beneath it and surrounded by healthy myometrium. Even though our case had some degree of cervical and parametrial invasion, dense deep cervical (low posterior UB)
invasion with residual healthy myometrium <2 cm to repair on the lower uterine edge and lateral (parametrial) invasion were associated with high risk of failure of conservative surgery, haemorrhage, and UB injury.1 6 7 10 12

Learning points
► Due to serious morbidities with expectant management, and unproven safety of conservative surgery techniques yet, radical management with caesarian section hysterectomy remains to be the definitive management of placenta accreta spectrum (PAS).
► On surgical diagnosis, uterine window should not be confused with PAS or placenta percreta.
► Dense deep (low posterior) urinary bladder and parametrial invasion are associated with high risk of failure of conservative surgery, and occurrence of complications.

Acknowledgements We would like to thank Dr. Ahmed Soliman, lecturer of pathology at Newgiza University, for examining the specimen and providing us with microscopic images like in figure 7.

Contributors The case was under the care of AM, ITE edited and revised the manuscript.
Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.
Competing interests None declared.
Patient consent for publication Obtained.
Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iDs
Abdalla Mousa http://orcid.org/0000-0001-7260-8363
Islamic Tarek Elkhateb http://orcid.org/0000-0002-6051-7445


dedicated to differential imaging, we used different microscopic tools to differentiate placental pathology at Newgiza University, for examining the specimen and providing us with microscopic images like in figure 7.

Table 1 Main differences of our approach from the most cited conservative surgery techniques

<table>
<thead>
<tr>
<th>Surgical step</th>
<th>Our approach</th>
<th>One-step conservative surgery4 9 12</th>
<th>Triple-P technique6 12</th>
<th>Stepwise surgical approach4 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvic devascularisation</td>
<td>Bilateral ligation of uterine arteries at low and high levels. Then, anterior and posterior cervical wall control sutures</td>
<td>Tied a knot, compressed or inflated a balloon inserted into the aorta, in case of severe adhesions or haemorrhage</td>
<td>Inflation of pre-placed occlusion balloons in internal iliac arteries, with the interventional radiology service guidance</td>
<td>Bilateral internal iliac artery ligation</td>
</tr>
<tr>
<td>Myometrial repair</td>
<td>Myometrial reconstruction in two layers</td>
<td>Myometrial traction points sutures to test myometrial tensile capacity</td>
<td>Compression sutures applied to the line of trophoblastic invasion into the UB, followed by uterine incision repair in two layers</td>
<td>Continuous mattress sutures, at 5 mm distance, evert the uterine edge to outside and including reflector perimeter of UB with the lower uterine segment</td>
</tr>
<tr>
<td>Dealing with placenta in case of percreta invasiveness</td>
<td>Dissected from the UB after neoformed vessels devascularisation. UB injury may happen, and is repaired</td>
<td>Dissected from the UB after neoformed vessels devascularisation. UB injury may happen, and is repaired</td>
<td>This portion of the invading placenta is left in situ and followed-up</td>
<td>Dissected from the UB after neoformed vessels devascularisation. UB injury or cystectomy may happen, and are repaired</td>
</tr>
</tbody>
</table>

REFERENCES