

Management of placenta percreta – case report and clinic experience

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ABSTRACT

The incidence of placenta percreta is currently increasing. The treatment strategies are not clearly defined as there are a lot of inconsistencies in the literature regarding severity criteria. This pathology has a high risk for massive hemorrhage, therefore it is very challenging to agree on a standardized management. The therapeutic approaches include expectant management with placenta left in situ, conservative management and radical treatment. Cesarean hysterectomy currently represents the approach of choice for this condition, ideally performed by a multidisciplinary team. Conservative alternatives have been proposed to reduce maternal morbidity and maintain future fertility. The expectant management has benefits on reducing uterine perfusion and blood loss, useful in case of bladder or parametrial invasion. Potential late complications of placenta percreta left in situ often require further emergency surgery. Delayed hysterectomy has the aim to overcome these difficulties, but the reported outcomes are still contradictory. For these reasons, the most recent recommendation is not to perform a second elective surgery in a hemodynamically stable patient. In this paper we present the late complications of a case treated by expectative approach and the overall management in our clinic for the last five years with placenta accreta spectrum disorders.

Keywords: placenta in *situ*, urinary bladder invasion, placenta percreta, cesarean hysterectomy, postpartum hemorrhage

INTRODUCTION

The incidence of placenta accreta spectrum (PAS) is currently increasing due to the increased rate of cesarean delivery (CD) (1,2). Among the subtypes, placenta percreta is the most severe form of pathologic adherence of placenta, with chorionic villi penetrating the uterine serosa and even invading other adjacent organs (3). The overall incidence of placenta percreta is around 5% of all PAS cases and the risk of bladder invasion is estimated at 1 in 10,000 pregnancies (4).

Placenta percreta is one of the most severe obstetric complication with high morbidity due to

massive hemorrhage, bladder injury, disseminated intravascular coagulopathy (DIC), repeated surgery and systemic infection. The overall mortality rate is reported at about 7%.

Antenatal diagnosis is highly needed because it can minimize the maternal morbidity and mortality. Obstetric ultrasonography is the primary antenatal diagnostic modality (5), even though the absence of ultrasound findings does not exclude a diagnosis of PAS. Patients with high clinical risk for PAS should be referred for ultrasonography performed by health care providers with experience in the diagnosis of this condition. Patients with suspected or

diagnosed PAS should refer to a level III or IV medical center with expertise and resources in cases of severe hemorrhage (5).

The most generally accepted management option of placenta accreta spectrum is cesarean hysterectomy before the onset of labor. The timing of delivery should be personalized to each unique case circumstances, with general recommendation to schedule surgery at 34 0/7–35 6/7 weeks of gestation. The surgical approach involves cesarean delivery of the fetus, uterine closure with placenta left in situ, ideally no attempt at forced placental removal, immediately followed by hysterectomy (6). However, for placenta percreta the gold standard approach is not always attainable. Since the bladder, cervix or parameter invasion are extremely likely to cause massive hemorrhage or urinary tract injury, the expectative approach can be a valid option, with placenta left in situ, provided a close monitoring of these cases.

The ideal treatment plan is yet to be clarified and the debate continues between expectant or surgical management, as well as the need for delayed hysterectomy or the impact of additional therapies. All specialists should be aware of the potentially late complications in both therapeutic strategies.

In this paper, we present our clinic experience with PAS in the last 5 years starting from a case of placenta percreta complicated by DIC at 7 weeks after expectant management.

CASE PRESENTATION

We present the case of a 42-years old Caucasian patient who presented to the Emergency Room of University Emergency Hospital of Bucharest for massive vaginal bleeding at 65 days after cesarean delivery for placenta praevia and percreta which was left *in situ*. Regarding personal medical history, she had four cesarean sections, no abortions and insignificant personal pathological history.

According to the evolution of the pregnancy, during the second trimester morphology ultrasound at 22 weeks of gestation was documented a placenta previa without suspicion of abnormal adherence. At 37 weeks of gestation the obstetrical ultrasound confirmed the placenta previa and percreta with placental invasion of the urinary bladder. Also, in this moment of the pregnancy, based on blood tests a diagnosis of gestational diabetes mellitus was made. The fourth cesarean was planned and performed at 37 weeks and 3 days in a third-degree maternity and the patient delivered a healthy baby weighing 3,600 g. Placenta was left *in situ* and hysterectomy was attempted, but the dissection of the vesicouterine space led to an extensive 7 cm lesion of the urinary bladder. At that point, the surgi-

cal team decided to stop the surgery, because the risks outweighed the benefits and sutured the bladder. The next day, the patient was transferred to urological clinic for definitive treatment. After two weeks of antibiotherapy and monitoring, the patient was discharged without further investigations, being informed about the necessity of close follow-up. Also, she was notified about the definitive surgical treatment at a later time, according to her clinical evolution.

The patient declared minimal vaginal bleeding during two weeks prior the presentation in our service. She was evaluated in the clinic where the cesarean delivery was performed and she was reassured that there was no indication for surgery yet, since she was stable and no signs of infection were detected. That evaluation identified areas of expected necrosis in the placenta, but in spite of the persistent ultrasonographic evidence of bladder invasion and vaginal bleeding, continuous follow-up in the outpatient care was indicated.

At the time of admission in our department, the examination revealed massive vaginal bleeding, hematuria was objectified by perurethral catheterization and urinalysis showed signs of infection with leucocyturia, presence of nitrites and proteinuria. The patient became hemodynamically unstable with signs of hemorrhagic shock, hypotension, tachycardia, tachypnea, presenting cool extremities, extensive bruising and delayed capillary refill. Initial blood test revealed anemia (hemoglobin 7.8 g/dl, hematocrit 25%), thrombocytopenia (76,000 platelets/mm³) and leukocytosis (12,610 white blood cells/mm³). Since MRI evaluation was not available at the moment, a computed tomography (CT) scan was urgently requested and it showed intrauterine placenta with extensive vascularization, as well as invasion in the myometrium and upper part of the bladder (Figure 1).

The blood bank was notified, and large volume blood transfusion was prepared. After preoperative counseling on the possible surgical complications, an informed consent was obtained. The patient was immediately transferred to the operating room, intensive care measures were initiated, mainly with blood product replacement. The later arrived complete blood test showed prolonged partial thromboplastin time (46.1 sec) and severe hypofibrinogenemia (22 mg/dl). During surgery were administered three units of RBCs, two units of fresh frozen plasma (FFP), one unit of platelets, antifibrinolytic therapy and prophylactic antibiotics.

The multidisciplinary team included two experienced gynecologists as well as urologist, general surgeon and anesthesiologists. The rigorous examination of the abdominal cavity showed an enlarged uterus of about 25/15 centimeters with a normal

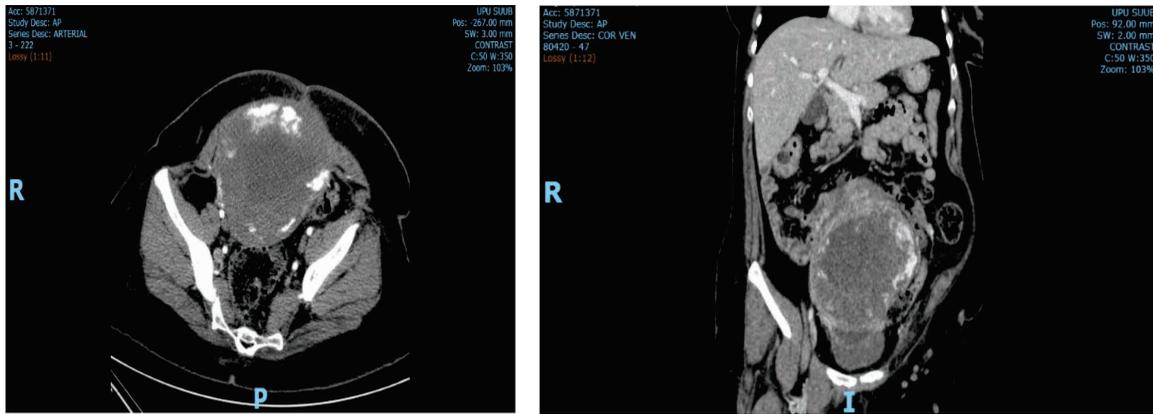


FIGURE 1. Sagittal and coronal CT sections showing the myometrium with variable thickness, almost absent, except for the fundic region and the placenta previa with areas of calcification, without a line of demarcation from the upper contour of the bladder

looking fundic vertical suture, placental invasion throughout the serosa in the lower half of the uterus and through the uterine bladder (Figure 2), diffuse uterine and right parametrial vascular engorgement, as well as right adnexal adhesions.

After difficult adhesiolysis, the uterovesical space was dissected and a cystotomy of five centimeters long revealed no evidence of vesical mucosa invasion. Total hysterectomy with unilateral right salpingo-oophorectomy was performed (Figure 3). The urologist assessed the urinary bladder incision, repairing the area of the dome and posterior wall using two layers of continuous absorbable sutures. The instillation of methylene blue dye confirmed the successful bladder repair. Eventually, efficient hemostasis was achieved after using Tachosil powder for diffuse bleeding areas and routine closure was undertaken.

The final diagnosis of percreta was confirmed by histopathology. Figure 4 shows the histopathological image of the placenta.



FIGURE 3. Total hysterectomy specimen showing placenta percreta

Post-operative, the patient needed complex intensive care treatment for hemodynamically stabilization, supplementary blood transfusion with 6 units of RBCs and 2 unit of FFP and extubation was safely performed after 2 days. Hematuria gradually diminished until complete remission. The patient returned in the Department of Gynecology and Obstetrics, where the evolution was favorable under antibiotics and anti-inflammatory drugs.

The patient was released after 7 days from surgery with uncomplicated evolution and favorable health status. The urinary catheter was removed after 3 weeks and follow-up at one month after surgery showed no late complications.

DISCUSSION

During the last 5 years, in our hospital were managed 25 cases of placenta accreta spectrum: 7 cases of placenta accreta, 7 cases of placenta increta and 11 cases of placenta percreta. In the last subgroup, two cases (including the one presented above) were admitted for complications of initial surgery performed in different services. One case presented as an emergency and was diagnosed after delivery. Other eight cases received long term antenatal monitoring and planned surgical treatment in our clinic.

Although the exact cause of PAS remains unknown, the most important clinical situations associated with abnormally attachment of the placental villi to the myometrium and even surrounding tissues are previous cesarean delivery and placenta previa. The rising incidence follows the trend of the increasing cesarean delivery worldwide (1). The number of previous cesarean deliveries correlates with the risk of PAS (7). Additional risk factors include advanced maternal age, multiparity, prior uterine surgeries or curettage and Asherman syn-



FIGURE 4. Uterine specimens after delayed hysterectomy with placenta left *in situ*. The histopathological result confirmed the placenta percreta with intramiometrial and serosa invasion on the lower half of the anterior uterine wall with multiple areas of villi necrosis and umbilical cord necrosis

drome. All the PAS cases we managed were also confirmed as placenta previa and all of them had history of uterine scarring. The average maternal age was 38.6 years for percreta subgroup, 38 years for increta subgroup and 36.4 years for accreta subgroup.

Most cases are still being diagnosed during delivery or immediately postpartum. Antenatal diagnosis is extremely important as it facilitates patient counseling and management planning in experienced facilities. Obstetric ultrasonography has very high sensitivity and specificity and ACOG promotes it as the main imagistic tool to assess PAS. Ultrasound performed by experienced specialist represented the principal diagnostic tool for our cases too (Figure 5). Regarding our experience, we report a singular case where the ultrasound evaluation missed the diagnostic of pathological adherence of

placenta. It was the case of a 36 years old patient with history of a cesarean delivery who was admitted at 27 weeks of gestation with premature membrane rupture, suspicion of chorioamnionitis and dilated cervix. Massive hemorrhage occurred after vaginal delivery, requiring emergency surgery, which revealed placenta percreta invading the urinary bladder.

Magnetic resonance imaging is another important tool for antenatal evaluation of PAS, although it is not preferred for the initial evaluation (8). A recent study showed the excellent MRI accuracy in evaluating placenta percreta, with 100% specificity for predicting the parametrial, bladder and cervical invasion, and the sensitivity was 90.9%, 87.5%, and 100%, respectively (9). Out of the total eight cases of placenta percreta we monitored prior to surgery, seven were supplementary evaluated by MRI (Figure 6).

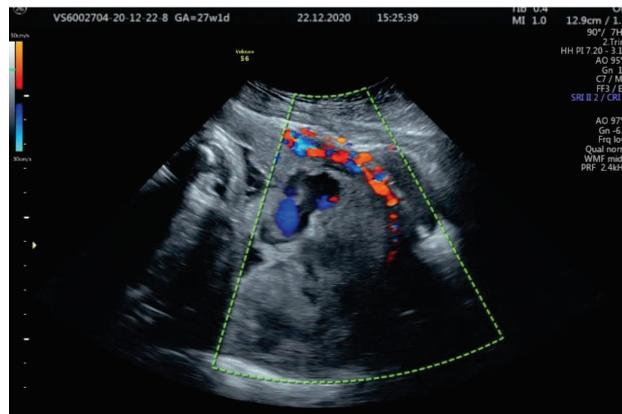


FIGURE 5. Placenta covering the internal cervical ostium completely, lacunar aspect and inhomogeneous retro-placental aspect- ultrasound performed at 19 and 27 weeks of gestation, respectively in a case of placenta previa and percreta (personal collection of Prof. Cirstoiu)

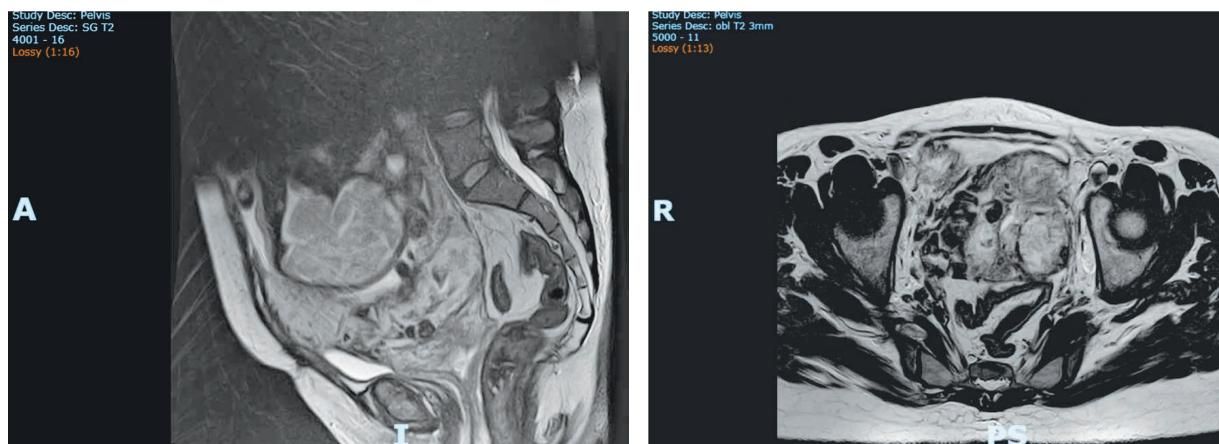


FIGURE 6. Sagittal and transversal sections from MRI scanning performed at 37 weeks of gestation in a patient G3 P3 showing a grade IV placenta previa with overall decrease in myometrial thickness and two paramedian lobes with increased vascularization that present no visible demarcation with the bladder, although no evidence of intravesical villi was mentioned

The management of PAS can be extremely challenging. Cesarean hysterectomy is currently recommended by the American College of Obstetrics and Gynaecology and is considered the gold standard treatment. Occasionally, a subtotal hysterectomy can be safely performed, but persistent bleeding from the cervix usually enforce total hysterectomy (10).

In this regard, we faced a case of complicated subtotal hysterectomy performed in a different service for placenta percreta with subsequent extensive pelvic hematoma, acute severe anemia and acute kidney injury. The case required repeated surgery for hematoma drainage, completion of the hysterectomy, adnexal removal due to intractable bleeding and partial cystectomy due to placental invasion.

Another management option for PAS is conservative surgery for fertility preservation, in selected cases. here is no evidence that routine local resection in all cases of PAS reduces maternal morbidity or mortality compared to other treatment methods, but it can be reasonably successful for selected cases, meaning focal disease (adherent/ invasive area is < 50% of the anterior surface of the uterus) and no invasion into the parametrium and/or uterine cervix (11). We had two cases of placenta accreta successfully treated by a conservative manner with local myometrial resection.

Expectant management or leaving the placenta in situ and waiting for its complete resorption is also an alternative approach. This appears to be associated with less blood loss and lower transfusion requirements than both hysterectomy and uterus-conserving surgery. Such management strategy is appropriate for women wishing to preserve their fertility and for these cases where hysterectomy is considered to be at very high risk of surgical com-

plications, including the cases of placental invasion in the urinary bladder or parameters.

Expectant management is reported to be successful in 60-93% of cases (11,12). Most studies used avoidance of hysterectomy as the outcome measure of successful expectant management. The risk of late complications such as postpartum hemorrhage, transfusion, infection, DIC, fistula formation, long-term monitoring and need for an emergency hysterectomy (13) should be kept in mind when choosing such management. These complications might be prevented by delayed planned hysterectomy, although the International Society for Abnormally Invasive Placenta documented no added advantage of delayed hysterectomy. Potential risks of a second elective surgery usually outbalance the benefits in stable patients (11).

The largest case series of expectant management published to date is a multicenter retrospective study that included 167 cases of AIP in 40 teaching hospitals (14). The overall success rate of uterine preservation was 78% and severe maternal morbidity was reported in 6% of the cases. An empty uterus was obtained spontaneously in 75% of cases, with additional hysteroscopic resection and/or curettage performed in 25%. In this study where performed 18 delayed hysterectomies. The aim of such approach is to achieve decreased uterine blood flow and regression of placenta from surrounding structures, but the exact time to perform delayed hysterectomy is debatable. Some authors reported good outcomes with elective delayed hysterectomy after 2-4 weeks following CD (15), while others (16) suggested that the ideal time for hysterectomy was after 4-6 weeks subsequent to CD. On the contrary, another study reported spontaneous placental absorption in 80% of cases after 4-6 weeks of CD during a conservative approach and suggested that

elective hysterectomy may not be required after 4-6 weeks of CD (17).

Some authors have proposed adjuvant therapies for the expectant management, but they have a very weak level of evidence of efficacy and are not recommended for routine use. The administration of methotrexate (18) to hasten the placental resolution has evidence for potential significant harm including maternal death so it is not recommended, neither is the prophylactic uterine artery embolization (11). Given extensive neovascularization with aberrant blood supply, occluding some of the pelvic vessels can cause thromboembolism or might exacerbate bleeding from the collateral circulation. However, therapeutic embolization for postpartum hemorrhage in conservatively managed women is useful to avoid hysterectomy (11).

For the placenta percreta there are no clear treatment protocols and the rarity of this condition makes difficult for the clinicians to achieve high individual expertise. The general recommendation is to refer this cases to a tertiary care center offering continuously available medical staff, trained and experienced with such complex obstetric condition. Access to a blood bank with protocols in place for massive transfusion is extremely important. Good outcome of placenta percreta treatment usually depends on multidisciplinary-team care and requires mixed expertise of obstetricians, urologists, interventional radiologists, hematologists, intensivists, neonatologists (5).

Regarding our experience with the 25 cases of PAS, we report no case of maternal death and only one fetal antepartum death. This occurred in a 38

years old patient gravida X, para V with no history of CD who presented massive hemorrhage at 29 weeks of gestation. Cesarean hysterectomy was necessary to control the bleeding caused by placenta accreta. The postoperative period was complicated by sepsis.

For the eight cases of placenta percreta integrally monitored and treated in our clinic, preoperative protocol routinely included iron supplementation to optimize hemoglobin levels and imagistic evaluation by a combination of serial obstetric ultrasonography and MRI. Preoperative cystoscopy was performed in six cases (Figure 7) and only one overestimated the bladder wall involvement. Five cases required partial cystectomy and none of them associated postoperative urinary complications, although only three cases benefited from adjuvant bilateral ureteric stent placement.

In our department we treat placenta percreta by cesarean delivery followed by total hysterectomy (Figures 8, 9) and the main reason for lacking complications after complex surgery is the combination of advanced intensive care facilities and high experienced surgeons, whose expertise gradually improves (19).

Conservative surgery was applied only for two cases of placenta accreta. We report no cases involving expectant management, apart from the above case report.

The particular severity of placenta percreta is caused by increased risk of massive and sometimes life-threatening obstetric hemorrhage, as the average blood loss during delivery is 3 liter or more in 90% patients (20). Ten out of our twelve cases of pla-

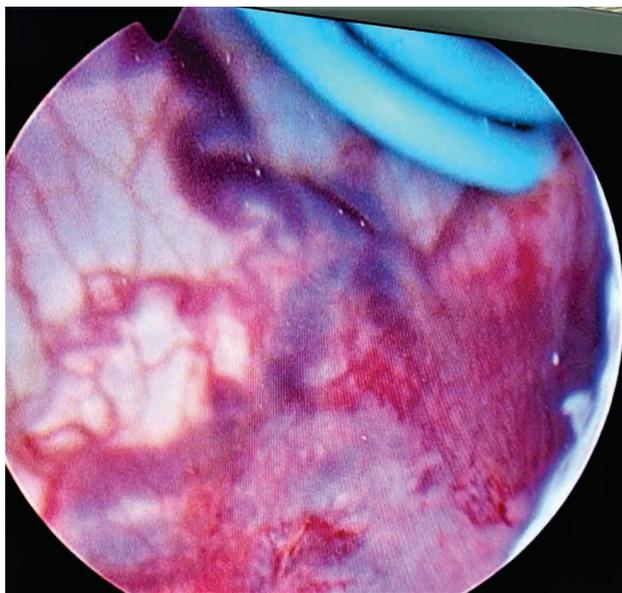


FIGURE 7. Preoperative cystoscopy revealing placenta vessels in the bladder wall at the time of ureteral stent placement; note the neovascularization and bulging of the posterior bladder wall



FIGURE 8. Uterine specimen after total hysterectomy showing mediocorporeal incision above the anterior bulge of a placenta percreta

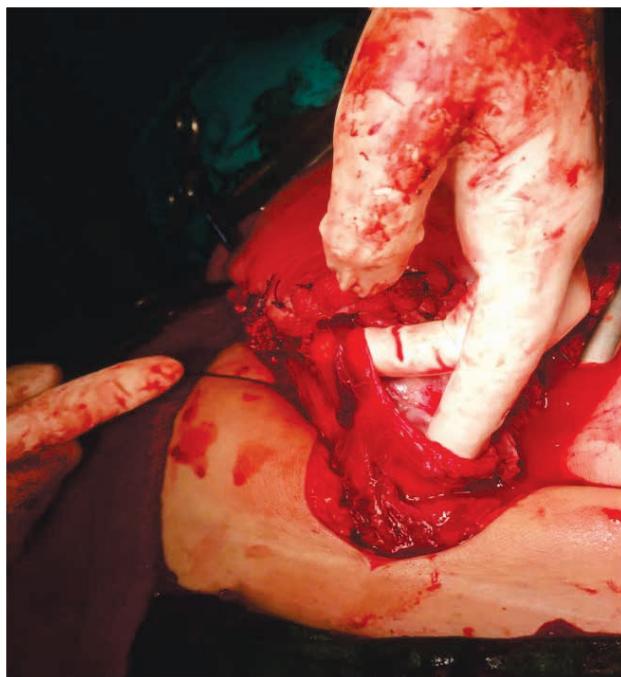


FIGURE 9. Intraoperative aspect of neovascularization with thick vessels for the urinary bladder invaded by placenta percreta

centa percreta required intensive care measures for severe hemorrhage. The necessary time for stabilization in our PAS cases varied between a minimum of 10 hours and a maximum of 9 days.

We presented a placenta percreta case complicated by bladder invasion managed expectantly by leaving the placenta *in situ* after CD. The unfavorable outcome was marked by late onset at 7 weeks after CD of a massive hemorrhage and subsequent disseminated intravascular coagulation, requiring emergency surgery and complex intensive care measurements. Initial evaluation of the patient and the baseline assessment suggested a possible onset of DIC so the primary measure was to assure massive transfusion, along with emergency imagistic evaluation by obstetric ultrasound and abdominopelvic CT scan. The hypofibrinogenemia was seen as the biomarker most predictive of severe hemorrhage (21) and immediately oriented towards supplementary intensive care measures.

The urological morbidity of placenta percreta invading the bladder is reported in the literature as high as 72% (22), but in our case, despite the poor

preoperative preparation lacking ureteric stent placement or cystoscopy information, and despite the previous surgical intervention on the bladder, no long-time urinary tract complications occurred. For this case we had operative assistance from the urologist as it is highly desirable (23) and furthermore, at the time of hysterectomy the bladder invasion diminished, allowing a minimum cystostomy that was properly repaired.

Intraoperative hemorrhage was constantly balanced by blood products replacement and antifibrinolytic therapy. The reduced diffuse bleeding during surgery resolved under application of fibrinogen and thrombin human topical powder, without necessity for interventional radiology measures, although they were also available. Post-operative monitoring in our intensive care unit setting was extremely important and hemodynamic stabilization was achieved the next day post-surgery.

The paucity of appropriate evidence for the optimal management of placenta percreta and clear severity stratification entails individualized strategy on a case-by-case basis. We believe that conservative or expectant approaches should be rare and considered individually, looking with more interest toward perfecting the immediate surgical management. Since these severe cases are rare, we insist on the use of a consistent multidisciplinary team, being shown that progressive experience gained by a team actually improves maternal outcomes and drives internal continuous quality (24).

CONCLUSIONS

Placenta percreta is a challenging condition with great risk of life-threatening bleeding. Besides the invasion of the urinary bladder requires even more robust treatment planning in multidisciplinary team. Referral of such cases to centers with high expertise and experience in managing abnormally invasive placenta is advisable. The expectant management of placenta percreta can associate disastrous maternal complications even beyond 6 weeks after CD. The underestimation of these late complications can have potentially devastating consequences; therefore, we support the cesarean hysterectomy.

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