Case Report

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Cesarean Scar Ectopic Pregnancy - Operative Management with Bilateral Temporary Iliac Artery Occlusion

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Abstract

Objective: The paper describes management of cesarean scar pregnancy with bilateral internal iliac artery occlusion prior to operative removal of the gestational sac.

Methods: Both internal iliac arteries were temporally occluded before the operation to assure perioperative bleeding control.

Results: The bleeding was well controlled during the operation and the cesarean scar pregnancy was safely removed. The anterior uterine wall healed completely within 8 weeks postoperatively. The total blood loss was approximate 1150 ml.

Conclusions: Bilateral internal iliac artery occlusion is a safe and effective method of perioperative bleeding control in patients diagnosed with cesarean scar pregnancy.

Keywords: Cesarean scar pregnancy, Arterial occlusion, Internal iliac artery occlusion

Introduction

Cesarean scar pregnancy (CSP) is a rare form of ectopic pregnancy. The incidence is estimated at 1:2226 of all pregnancies [1]. Its incidence corresponds with increasing cesarean section rate. CSP is a life-threatening condition due to an increased probability of hemorrhage caused by uterine rupture [2]. Conservative treatment of methotrexate (MTX) is believed to be an optimal therapeutic choice for patients with CSP located close to vesico-uterine space and bladder wall [3]. In our patient, despite administration of MTX for 4 weeks, the gestational sac systematically grew to 80 mm in diameter, subsequently infiltrating the bladder wall. The failure of conservative treatment encouraged us to use an operative treatment technique, backed up by intra operative bleeding control. Prior to the operation we decided to perform an elective temporary bilateral internal iliac artery occlusion. This technique has been successful in treating patients with placenta accreta [4,5].

Case Report

A 35 year-old patient (gravid a 2, para 2) presented to our hospital due to vaginal spotting at 7 weeks of gestation. She had a history of two cesarean sections: in 2005 (breech presentation) and 2012 (due to a previous cesarean section). Initial β-hCG level was 11870 mIU/L. A transvaginal ultrasound revealed an ectopic pregnancy located in the cesarean section scar...
The gestational sac was located frontally to the isthmic portion of the uterus and was surrounded by abundant trophoblastic circulation sized 48 × 43 mm and contained multiple septations and hyper-echogenic solid components. The uterine cavity and cervical canal were empty. The mass protruded from the frontal part of the uterus and was infiltrating the bladder, which met the criteria of an exogenic CSP [6]. Based on the initial examination, a conservative treatment with systemic methotrexate (MTX) of 100 mg i.m. was started. The same dose of MTX was repeated one and two weeks later. Although β-hCG levels dropped systematically (Figure 2), the gestational sac grew, infiltrating the bladder. β-hCG level was low (148.5 mIU/L), no FHR was present. Final presentation of the CSP in the ultrasound revealed a highly vascularized tumor of about 80 mm in diameter (Figure 3). The bladder wall adjacent to the CSP was only 2 mm thin. Because of unsuccessful conservative treatment of MTX and a high risk of uterine rupture, we decided to remove the CSP operatively.

Treatment

Due to high risk of profuse hemorrhage we decided to perform temporary internal iliac artery embolization prior to the operation. The right femoral artery was punctured, using the Seldinger technique, and 5F vascular introducer was placed. A straight 5F catheter (Balton, Warszawa, Poland) was placed above the aortic bifurcation and the digital subtraction angiography (DSA) was performed. A pelvic angiogram revealed a large mass located in the center of the pelvis, between the iliac arteries. An abundant blood supply was observed from internal iliac arteries (Figure 4). Then the left femoral artery was punctured, and the same 5F introducer was not inserted (Balton, Warszawa, Poland). A guide wire Hi-Torque Balance Middleweight 0.014 (Abbott, Illinois, USA) was cross-over placed in the left internal iliac artery, through the bifurcation of the aorta. Then, a balloon catheter size 5 × 20 mm (Aviator Plus, Cordis, USA) was introduced to the left internal iliac artery, inflated and left in place of the origin of the vessel. Then, a second balloon catheter was placed into the right iliac artery, using the same technique (Figure 5). Both balloons were inflated with saline solution to 4 atm. and left in place (Figure 6). The patient was then transferred to the operating room and operated immediately. The time between the occlusion of internal iliac arteries and the operation (skin incision) was about 30 minutes. Prior to the operation the bladder was filled with 300 mL of methylene blue.

The patient had general endotracheal anesthesia. A Joel-Cohen incision was performed and the bladder was gently detached from the CSP. The CSP formed more than 2/3 of the anterior uterine wall. The removal of the mass was performed without direct visualization due to
strong bleeding. Blood loss in this part of the procedure was about 750 ml. After removal, only the upper 1/3 of the anterior uterine wall was present. No symptoms of vesical damage were observed. The operated site was compressed and six mattress sutures were placed to approximate uterine edges. Finally, the second layer of figure-of-eight single sutures was placed. As there were no symptoms of intra-abdominal bleeding both balloons were deflated and the abdominal cavity was closed. After deflation of intra-arterial catheters a moderate vaginal bleeding (approx. 400 mL) was noted and managed with Foley catheters put into uterine cavity and filled with 30 mL of saline solution (no cervical dilation was needed). Total blood loss was about 1150 mL. Finally, the arterial catheters were removed. During the operation the patient was given one packed red blood cells (PRBC), 500 mL of colloids and 500 mL of 0.9% NaCl. Her initial systolic blood pressure (SBP) was 90/60 mm Hg and did not change significantly during the procedure. After the operation the patient stayed for 16 hours in ICU and was given another 1 L of intravenous fluids, 2 units of PRBC and 2 units of FFP. Then, the patient was transferred to our department, the abdominal drain as well as intrauterine Foley catheter were removed. The postoperative stay was uneventful and the patient was discharged 5 days after operation. Two months after the operation a transvaginal ultrasound revealed normal structure of the anterior uterine wall (Figure 7).

Figure 4: Digital subtraction angiography (DSA) showed the large mass supplied by the right and left internal iliac arteries.

Figure 5: The right internal iliac artery with a balloon catheter. The second balloon catheter placed in the left internal iliac artery was control by the DSA from the vascular introducer in the left femoral artery.

Figure 6: Two balloon catheters, inflated and placed bilaterally in the internal iliac arteries.
**Discussion**

The treatment modality of CSP depends on patient's condition and location of the pregnancy. Management options vary between watchful observation and emergency hysterectomy. Different non-conservative treatment methods were described in the literature, including curettage, hysteroscopy as well as hysterectomies. Some of these procedures were performed after uterine artery embolization.

Cesarean scar pregnancies can present as an endo or exogenic type. While endogenic CSP can end up with viable birth (albeit still being at high risk for massive bleeding), the exogenic CSP usually progresses to uterine rupture and consecutive hemorrhage in first trimester of pregnancy [7]. Therefore, the former can be managed with expectant management but the latter is commonly known as a life-threatening condition is required to be treated as early as it is possible. The conservative strategy is optimal for CSP located within the vesico-uterine space, in hemodynamically stable painless patients less than 8 weeks of gestation and when the bladder wall is thinner than 2 mm [8]. Nevertheless, some studies showed that systemic methotrexate (MTX) treatment had a high failure rate of more than 50% [8]. Thus, some authors recommend this therapy only to patients accepting surgery as a second line treatment in case of failure of systemic MTX therapy. This high failure rate is believed to result from the fibrous tissues surrounding the scar itself and thus diminishing therapeutic concentration of MTX in the gestational sac [8]. Overall, many authors proposed combined administration of systemic MTX, with other agents to improve treatment results [8].

Angiographic arterial embolization is widely used in different parts of the body to perform minimally invasive bleeding control. Selective uterine artery embolization (UAE) is well known to be an efficient method of dealing with CSP in a group of patients who want to preserve fertility [9]. Despite its potential hazards such as ischemia and necrosis, this technique is associated with low morbidity and high uterine preservation rate [9]. UAE embolization leads to gradual involution of the pregnancy and, depending on embolization agents used the revascularization of uterine arteries starts around 2 weeks after the procedure and is restored completely within 3 months [10]. It has to be noted that UAE, even if combined with local MTX administration, requires additional dilatation and curettage due to persistent bleeding in 6 of 10 patients. This usually happens when CSP diameter is bigger than 5 cm [11]. Some of these patients have massive bleeding that requires reembolisation or hysterectomy. Another unfavorable consequence of the UAE can be acquired arteriovenous malformation that might present a few weeks after the initial procedure as sudden, massive vaginal bleeding [9]. In this case the diameter of the mass was 8 cm, thus the expected risk of bleeding in post procedural period was too high to accept it as a potential hazard. After consultation with interventional radiologists we decided to perform a temporary occlusion of both internal iliac arteries. Balloon occlusion of internal iliac artery does not completely stop blood flow to the uterus, it only reduces systolic pressure distal to the site of occlusion. Decreased blood flow enables easier management of operating field and helps to avoid iatrogenic complications.

Temporary internal iliac artery occlusion was previously used in patients undergoing cesarean delivery with placenta accreta with various results [5,9]. The ultimate goal of surgical treatment is preservation of fertility and prevention of massive bleeding. Despite significant blood loss within the abdominal part of performed operation, the bleeding was not as rich as we would expect judging by size of the mass. We had to dissect the CSP from the bladder wall to prevent its injury. This dissection from the bladder lasted about 5 minutes and was associated with strong bleeding. After the excision the bleeding was controlled with local compression and when the anterior uterine wall defect was closed the bleeding stopped completely. After short observation both balloons were deflated while the abdominal cavity was still open. We did not see bleeding in the abdominal cavity and the...
abdomen was closed. During the closure of the abdomen a vaginal bleeding occurred and was managed by a Foley catheter. It is important to note that catheters placed inside pelvic vessels, can, although rarely, result in complications including lower limb ischemia related to thromboembolism of iliac arteries, the formation of post procedural pseudoaneurysm and rupture of artery [12]. None of these complications occurred in our patient.

Conclusions

Bleeding control was the most important concern in operative management of our patient. Because of the large size of the cesarean scar pregnancy, infiltration of the bladder wall, high risk of uncontrolled early or late post-procedural bleeding, we chose to perform elective operation after temporary bilateral iliac artery occlusion. The procedure yielded expected results: the intraoperative bleeding was controlled and only occurred during preparation of the bladder wall from chorionic tissues. No complications related intravascular procedure nor to the surgery itself were observed.

References


