Placenta percreta into the urinary bladder: the importance of the urologist

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The incidence of placenta accreta spectrum is on the rise. The most serious entity within this spectrum is percreta: extension beyond the uterus. The bladder is most commonly involved in these cases and is especially relevant for the urologist. Important sequelae include hemorrhage, massive transfusion, maternal mortality and urinary tract injury. Approaching this disorder as well as associated urinary tract involvement in a standardized and multi-disciplinary fashion significantly improves outcomes and reduces morbidity. Herein, we present a case of complete placenta percreta involving the bladder that was successfully managed with minimal obstetrical and genitourinary morbidity.

Key Words: placenta, urinary tract, hemorrhage

Introduction

Placenta accreta spectrum (PAS) is a serious obstetrical disorder. It occurs when there is an absence of decidua basalis that predisposes to invasion of the chorionic villi into the myometrium. The level of invasion is denoted accreta, increta or percreta. Accreta and increta refer to superficial and deep involvement of the myometrium, respectively, and account for 95% of PAS.[1] Placenta percreta occurs when the placenta extends beyond the serosa of the uterine wall with or without adjacent organ involvement. The sequelae of PAS include hemorrhage, massive transfusion, maternal mortality and urinary tract injury.[2]

Various quality improvement and patient safety initiatives have been proposed to manage this complex entity and they center around multidisciplinary care, early recognition and intervention.[3,4] The urologist is a critical member of the multidisciplinary team and planned urologic involvement has been associated with fewer urinary tract injuries and reduced blood loss.[2,5,6]

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Herein, we present a case of complete placenta percreta involving the bladder that was successfully managed in a multidisciplinary fashion with minimal obstetrical and urinary tract morbidity.

Case

A 36-year-old G10P2 female was transferred to our tertiary care center with vaginal bleeding, placenta previa and possible accreta. She was at 25 weeks gestation on presentation and otherwise healthy with a history of two caesarean sections. She was admitted to the high-risk obstetrical team and was stable with a hemoglobin of 110 and creatinine of 40. Urinalysis was positive for blood with > 50 erythrocytes/HPF. Doppler ultrasound confirmed anterior complete previa with a low portion of placenta bulging towards the bladder. There was no hydronephrosis. She continued to have vaginal bleeding in hospital and hemoglobin decreased to 95. A placental MRI was arranged because of the inconclusiveness of ultrasound and the looming need for surgery. MRI showed significant thinning of the interface between the uterus and bladder and was highly suspicious for percreta, Figure 1. A placenta accreta team was assembled including maternal fetal medicine, gynecology, urology and anesthesia. Given the age of the fetus it was decided to delay surgery for as long as possible. However, the plan was to ultimately carry out a caesarian hysterectomy.

On the night of post admission day 8 the patient developed brisk vaginal hemorrhage and spontaneous rupture of the membranes. The placenta accreta team was mobilized to the operating room. General anesthesia was administered and cystoscopy performed.

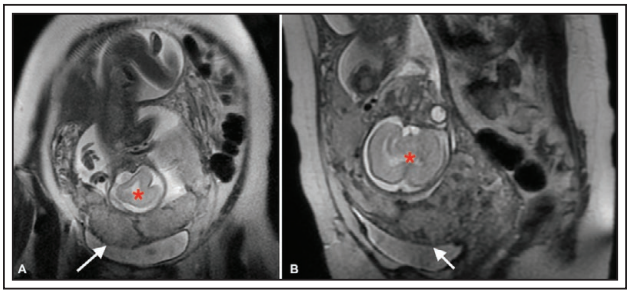

Figure 1. Multiparametric magnetic resonance (MR) imaging of placenta. Fetal head designated with star. (**A**) Coronal T2-weighted image showing focal bulge of placenta towards bladder with thinning of vesicouterine interface (arrow). (**B**) Sagittal T2-weighted image again showing findings of invasive placentation (arrow).

An augmented vascular network along the posterior wall was seen, Figure 2. The ureteric orifices were normal and 5Fr ureteric catheters were inserted and a foley catheter placed.

Through a midline laparotomy incision, the obstetrics team performed a caesarean delivery via a longitudinal uterine incision superior to the placental edge. The infant was delivered with delayed tone secondary to anesthetic. Apgars were 1, 5 and 7 with a birth weight of 980g. The cord was ligated and the uterus closed.

Large blood vessels were apparent from the lower uterine segment to the bladder. This plane was difficult to discern and the bladder was distended to aid delineation. Multiple percretal vessels were isolated and divided. These were extremely friable and resulted in bleeding. A 5 mm blunt tip LigaSure was therefore utilized and provided effective vessel-sealing and hemostasis. With ongoing posterior dissection, a focal location of frank invasion was encountered. The bladder was entered in the posterior aspect of the dome to begin a partial cystectomy. The partial cystectomy was performed using the LigaSure, keeping the invaded segment of bladder attached to the placenta, Figure 3. With the bladder mobilized and percreta addressed, the gynecology team performed a caesarean hysterectomy, Figure 3. This occurred without complication and the uterine vessels were safely divided away from the ureters. The ureteral catheters facilitated tactile identification.

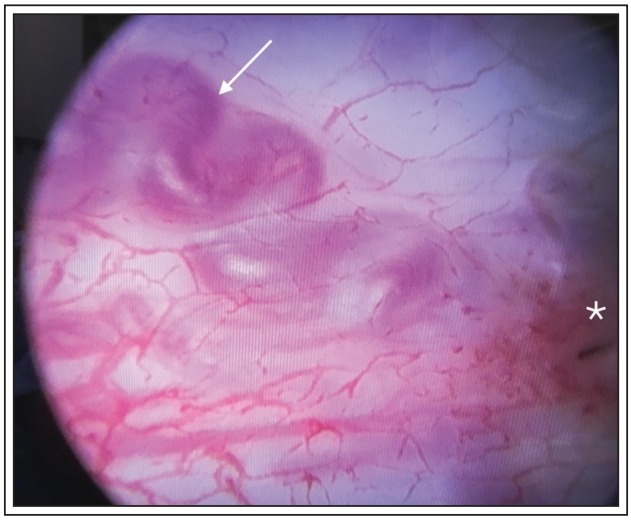

Figure 2. Intraoperative cystoscopic image demonstrating an abnormal network of vessels along the posterior bladder wall (arrow) with proximity to left ureteric orifice (star).

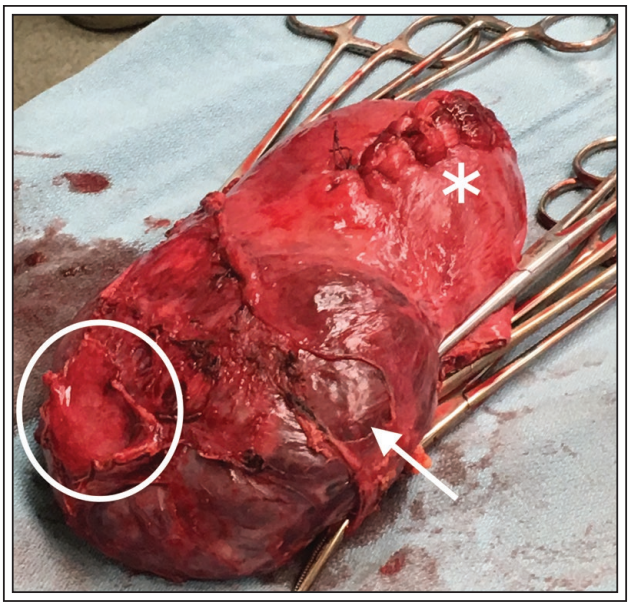

Figure 3. Uterus, placenta and bladder wall as single specimen. Placenta previa and percreta at lower uterine segment (arrow) with cuff of bladder (circle). Clamps on divided uterine pedicles. Suture line marks the longitudinal uterine incision used to deliver the fetus (star).

A large bladder capacity was noted, and the vaginal cuff was 3 cm away from the posterior bladder incision site. Given the proximity to the trigone, 6 Fr double-J stents were placed. The bladder was closed in two layers in a watertight fashion. Blood loss was 1.5 L and she received 1 unit. She was discharged home on postoperative day 6 with a foley catheter and no complications. Follow up cystogram showed posterior extravasation with reflux at 3 weeks. The stents were removed. Repeat cystogram at 1 and 2 months showed persistent small posterior extravasation with no tracking into the vagina. The foley was removed and the patient voided normally and was dry. At 4 months the patient reported normal voiding and occasional mild exertional incontinence without the need for pads.

Discussion

The incidence of PAS has been steadily increasing over the past 40 years and now occurs in about 1 in 500 pregnancies.[2] Higher rates of caesarean delivery and increasing maternal age are believed to be responsible.[5] Optimal management has been reported as early recognition and a tertiary care multidisciplinary approach.[4] Patients managed in this fashion have substantially improved outcomes compared to unplanned or acutely discovered cases.[2,7-9] Management of the uterus typically involves a caesarean hysterectomy following delivery of the fetus.

The rate of urinary tract injury is high and is reported between 16%-29%; this thought to be from a combination of urinary tract involvement, massive hemorrhage, and caesarean hysterectomy[5,10] The bladder is most commonly involved however the ureters and bowel are not immune.[6] The preoperative involvement of a urologist as part of the multidisciplinary team has been repeatedly shown to significantly reduce the risk of urinary tract injury at surgery.[1,3,5,6] Cystoscopy has equivalent sensitivity and specificity to ultrasound when it comes to diagnosing percreta and provides valuable information about the location of invasion, bladder capacity and proximity to the trigone.[10,11] Although based primarily on case studies, the use of ureteric stents has been shown to reduce ureteric injury and may aid in identifying the ureters.[3-5,7,10] In our case, the stents facilitated recognition of the ureters during division of the enlarged uterine vessels. Cystoscopy and stent insertion can be performed rapidly following anesthesia induction without imaging. Management of urinary tract involvement can include dissection of the vesicouterine space, identification of the ureters, partial cystectomy or ureteral reimplantation. In our case, an intentional transverse cystotomy was created superior to the location of invasion which allowed us to delineate the margins for the partial cystectomy and assess proximity to the trigone. This approach has been shown to minimize bleeding by avoiding the invasive placental vessels.[4,10]

The major concern in PAS is hemorrhage. Multidisciplinary management and preoperative planning have significantly reduced the average blood loss although it remains high at between 2-3.5 L with ranges of 0.5 to 18 L.[6-9] The blood loss in our case was only 1.5 L which we believe was facilitated by the multidisciplinary approach and use of the vessel-sealing device (LigaSure). The device reliably controlled placental vessels along the vesicouterine plane and significantly enabled the partial cystectomy with good hemostasis. Vessel-sealing devices in cases of PAS are not routinely used; however, we feel that they should be included when there is potential for significant blood loss as in these cases.[4]

With its increasing incidence, it is important that the urologist be familiar with PAS, its diagnosis and management. When recognized, it has been recommended that patients be managed in a tertiary care center with ready access to the necessary services, resources and adjuncts.[2,4] Early diagnosis is critical and both US and MRI can be used.[4,5] Of importance, is the involvement of a urologist in the multidisciplinary team.

The main operating room should ideally be used instead of the standard labor and delivery suite given their lack of specialized equipment and access.[2] Following anesthesia, cystoscopy should be performed with bilateral ureteric catheter insertion. After delivery of the fetus, the degree of urinary tract involvement should be assessed and a vessel-sealing device should be used when dissecting the vesicouterine space in cases of percreta. Frank invasion into the bladder is best managed by partial cystectomy to avoid operating on the placental vessels. As demonstrated in our case, following these recommendations can result in significantly improved outcomes and reduced morbidity. □

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