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Case report

Robotically assisted delayed total laparoscopic hysterectomy for placenta percreta[☆]



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ABSTRACT

Background: The prevalence of morbidly adherent placenta has dramatically increased in the setting of the rising cesarean rate in the United States. Delayed surgical management of placenta accreta and its variants is emerging as methods that may significantly decrease bleeding and perioperative complications; however, optimal surgical approaches have not yet been determined. In this report, we present a case of robotic-assisted delayed interval hysterectomy in a patient with placenta percreta.

Method: A minimally invasive approach, via a robotic-assisted total laparoscopic hysterectomy, was utilized for a 39-year-old gravida 9 para 3 with placenta percreta with placenta left in situ ten weeks after a tertiary cesarean section.

Experience: The robotic approach provided excellent visualization to facilitate fine planes of dissection, lower than expected estimated blood loss, and faster recover times when compared with conventional surgical approaches traditionally utilized for interval hysterectomies for placenta percreta.

Conclusion: Robotic-assisted hysterectomy may be considered as an alternative to laparotomy for the delayed interval surgical management of morbidly adherent placenta percreta.

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1. Introduction

As the rate of cesarean section in the United States has increased from under 5% in the 1960s to over 30% in 2002, abnormal placentation has dramatically risen in parallel (Wu et al., 2005; Martin et al., 2015). The incidence of placenta accreta, defined as an abnormal attachment of the placenta to the myometrium, is now suspected to occur with 1:533 deliveries (Wu et al., 2005). More severe variants of abnormal placentation include placenta increta, in which placental villi invade into the myometrium, and placenta percreta, in which placental villi invade through the myometrium. In cases of placenta percreta, the bladder is the most common attachment site outside of the uterus (Perez-Delboy and Wright, 2014). These disorders, characterized as morbidly adherent placenta (MAP), are associated with high risk of maternal morbidity from large volume blood loss, need for transfusion, intra-abdominal infections, ureteral damage, and fistula formation, as well as maternal mortality rates estimated as high as 7% (Sentilhes et al., 2010).

Severe maternal morbidity and mortality from MAP stem almost entirely from hemorrhage-related complications. Median estimated blood loss at time of cesarean hysterectomy for patients with placenta accreta has been reported to be 3 l with a mean transfusion requirement of 5 units of packed red blood cells (Wright et al., 2011). In addition to higher estimated blood loss, placenta percreta places patients at higher risk of bladder and ureteral injury (Sentilhes et al., 2010). In patients with placenta percreta, conservative management in which the uterus and the placenta are left in situ at time of cesarean delivery has been shown to decrease blood loss, need for transfusion, and disseminated intravascular coagulation through placental involution (Perez-Delboy and Wright, 2014; Wright et al., 2011). Despite limited literature on the best time for a delayed hysterectomy, to maximize the decrease in placental volume seen after embolization, the interval procedure is typically scheduled 6 to 8 weeks after delivery. Though in rare cases the placenta involutes and is passed vaginally, the vast majority of patients require a second surgery. In these patients, the delayed hysterectomy is routinely via laparotomy.

2. Method

Minimally invasive approaches for interval hysterectomy in patients with MAP have not been well studied despite lower rates of complications, lower blood loss, and shorter hospital stays for laparoscopy

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when compared to laparotomy. A small number of case reports describe additional benefits of laparoscopic assisted vaginal hysterectomy for placenta percreta including better visualization allowing for superior dissection of the bladder and improved hemostasis attributable to pneumoperitoneum (Wright et al., 2011). Robotic assisted laparoscopic hysterectomy has previously been described in a patient with placenta increta following delivery of a 20-week fetus in the setting of preterm premature rupture of membranes (Boes et al., 2013). Here, we present a patient who underwent a delayed interval robotic-assisted total laparoscopic hysterectomy for placenta percreta. Steps are detailed in operative video.

3. Experience

A 39-year-old gravida 9 para 3 with a surgical history notable for 2 prior low transverse cesarean deliveries and 5 prior dilation and curettage procedures was diagnosed prenatally by an ultrasound at 32 + 5 weeks gestation that showed placenta accreta, possible percreta. Her past medical history was uncomplicated. The pelvic ultrasound showed obliteration of the uterine interface, loss of the hypoechoic retroplacental zone, and increased vascularity proximal to the bladder, concerning for abnormal placentation. She subsequently underwent a pelvic MRI at 33 + 3 weeks that demonstrated loss of the myometrial margin and a placental lobule seen along the superior urinary bladder surface consistent with placenta accreta, and concerning for possible percreta. The patient was admitted to the hospital at 35 + 2 weeks gestation in preparation for a scheduled tertiary cesarean section via a mid-line vertical incision, fundal hysterotomy, uterine artery embolization and delayed hysterectomy. The patient was also consented for the possibility of an immediate hysterectomy in the event of uncontrollable bleeding. Prior to surgery at 35 + 6 weeks, she underwent placement of hypogastric artery balloon catheters and bilateral ureteral stents. Pre-operative cystoscopy was performed, showing a mass effect on the superior aspect of the dome of the bladder. Her cesarean section was notable for suspected placenta percreta on both the left anterior surface of the uterus above the bladder reflection and invasion of tortuous blood vessels on the uterine serosa into the right broad ligament. Given these findings and extensive pre-operative counseling, in hope of decreasing the likelihood of bladder injury, blood loss, and need for ureteral re-implantation, the placenta was left in-situ and a 3150 g neonate was delivered via fundal hysterotomy with Apgars of 1, 5, and 9. The umbilical cord was ligated, the placenta left in situ, and the hysterotomy was closed in the usual fashion. The patient then underwent embolization of her uterine arteries, and the ureteral stents were removed. Total estimated blood loss for the case was 1 l.

The patient received 2 units of packed red cells for symptomatic anemia on post-operative day 1. She recovered well and was discharged home with a plan for interval hysterectomy between 6 and 8 weeks. At the time of planned interval hysterectomy, the patient declined surgery despite intensive counseling, stating she was not physically or emotionally ready for a second surgery. She was lost to follow-up and re-presented to the emergency department 9 + 4 weeks from her cesarean section with complaints of vaginal bleeding. On physical exam, vaginal bleeding was minimal and her vital signs were within normal limits. She was admitted to the hospital and underwent a pelvic MRI which was notable for an enlarged uterus, with preserved fat plane between the bladder and the uterus and no evidence of periuterine extension of the placenta or bladder invasion.

Given her stable condition and her surgical history, she was counseled on the risks and benefits of various surgical options of management including open and minimally invasive approaches, and she opted to proceed with minimally invasive hysterectomy. She was taken to the operating room ten weeks after her cesarean section. She was given 2 g intravenous cefazolin for antibiotic prophylaxis, positioned in dorsal lithotomy, ureteral stents were placed, and an Advincula Arch uterine manipulator with a KOH cup was inserted. The

surgical system was docked in the center position after ports were placed in the typical fashion to allow for the completion of a radical hysterectomy. Surgical instrumentation used in this case included the monopolar shears, the PK™ dissecting forceps, and the prograsp forceps.

On survey of the abdomen, the lower uterine segment was bulging with the bladder densely adhered to the anterior portion of the placenta (Fig. 1). The hysterectomy (see video) was started by opening the pelvic sidewall lateral and parallel to the infundibulopelvic ligament. Limited collateral blood vessel formation was noted in the pelvis. The utero-ovarian ligaments were identified and dissected. The uterine arteries were skeletonized and sealed at their origin for added hemostasis. Following careful dissection of the bladder from the anterior uterus, the placenta was noted to be bulging, obscuring visual and tactile localization of the KOH cup anteriorly. Thus, colpotomy was initiated posteriorly. Once the posterior colpotomy was completed, careful dissection was undertaken to facilitate the anterior colpotomy. The uterus was placed in a 15 cm endocatch bag and removed vaginally through contained in-bag morcellation. Hemostasis was assured and the vaginal cuff was closed in the usual fashion. The estimated blood loss was 400 ml and operative time was 3 h and 10 min. Post-operatively, the patient received 2 units of packed red cells for symptomatic anemia. She was discharged home on post-operative day 3 in excellent condition. Pathology returned consistent with placenta percreta with the myometrium showing marked degeneration and hyalinization (Fig. 2).

4. Discussion

This case report of a patient with morbidly adherent placenta treated with an interval robotic-assisted hysterectomy ten weeks post-partum demonstrates that a minimally invasive robotic surgical approach is a feasible option for management of select patients with morbidly adherent placenta. Though there may be variations on how to complete this procedure robotically, our recommendation is to approach these cases with a docking style and instrumentation selection that is typically utilized for radical hysterectomy.

Hysterectomies performed for placenta accreta, increta, and percreta are high-risk procedures associated with substantial maternal morbidity and mortality, largely attributed to the high blood loss. Additionally, patients with placenta percreta and subsequent invasion of the placenta near or into the bladder are at dramatically increased risk of intraoperative bladder or ureteral injury. Use of robotic-assisted total laparoscopic hysterectomy in select patients can decrease both blood loss and rates of bladder injury through improved visualization and surgical precision. Patients also benefit from the well-established advantages of minimally invasive procedures, including decreased post-operative pain, shorter hospital stay, and faster recovery.

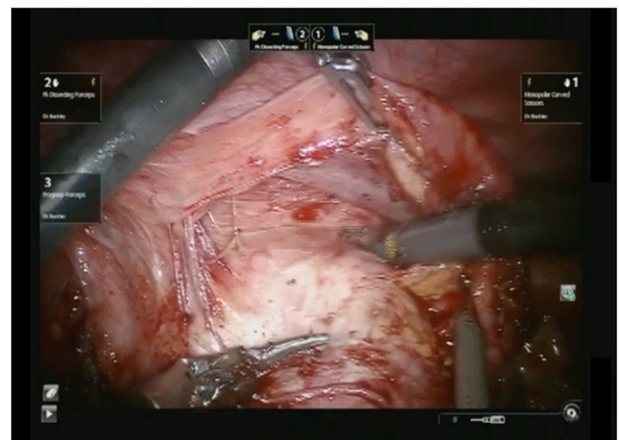


Fig. 1. Placenta seen on the anterior surface of the uterus.

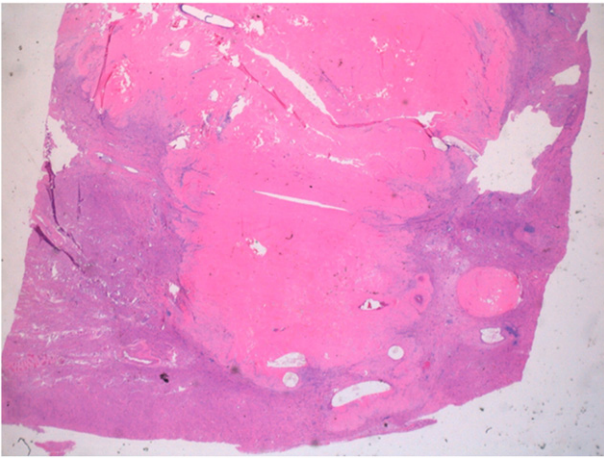


Fig. 2. Pathology demonstrating placenta percreta.

Careful patient selection is important for successful use of minimally invasive approaches for hysterectomy for morbidly adherent placenta. Patients should be followed closely in the outpatient setting with regular ultrasounds and MRI to define extent of uterine invasion. Many patients with morbidly adherent placenta pathology require emergent surgical interventions, which precludes a robotic approach. The patient described in this report underwent post-cesarean section uterine artery embolization, allowing for decreased vascularization of the uterus

during her hysterectomy. This approach requires coordinated, multidisciplinary pre-surgical planning, which may only be possible at tertiary care centers. In addition, operative teams must be experienced with robotic surgery, blood products should be readily available, and teams must be ready to convert to open laparotomy in case of emergency.

The increasing incidence and the associated severe morbidity and mortality of morbidly adherent placenta in the United States make this an urgent issue of study. Determination of optimal surgical approaches, including robotic approaches for management of placenta accreta, increta, and percreta, is essential to decreasing maternal morbidity and mortality from this increasingly common disease.

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