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Surgical technique

Caesarean hysterectomy for placenta praevia/accreta using an approach via the pouch of Douglas

AE Selman[a,b]

[a] Department of Obstetrics and Gynaecology, Clinical Hospital, Universidad de Chile, Santiago, Chile [b] Department of Obstetrics and Gynaecology, Clínica las Condes, Santiago, Chile
Correspondence: AE Selman, Division of Gynaecologic Oncology, Department of Obstetrics and Gynaecology, Clinical Hospital, Universidad de Chile, Santos Dumont 999, Independencia, Santiago, Chile. Email selmanalberto@gmail.com

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Placenta praevia/accreta is associated with significant maternal morbidity and mortality and is a common cause of obstetric hysterectomy. This paper describes posterior retrograde abdominal hysterectomy, a new surgical technique for caesarean hysterectomy, in 11 women with placenta percreta, increta or accreta There were no intraoperative or postoperative maternal complications, and only one fetus required admission to the neonatal unit, for prematurity. Our technique in placenta praevia/accreta allows easy identification of the vagina and early uterine devascularisation, as well as safe resection of the involved urinary bladder in women with placenta percreta showing bladder penetration. Analytical studies are needed to confirm our findings.

Keywords Caesarean hysterectomy, cytoreductive surgery, ovarian cancer, placenta accreta, placenta previa.

Tweetable abstract Posterior retrograde abdominal hysterectomy in women with placenta praevia/accreta may enable safer surgery.

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Introduction

The incidence of placenta accreta has paralleled the increase in caesarean deliveries, and now occurs in approximately three in every thousand deliveries in the USA.[1] Placenta accreta is considered a severe complication of pregnancy and may be associated with massive and potentially life-threatening intrapartum and postpartum haemorrhage.[2] As many as 90% of women with placenta accreta require blood transfusion, and 40% require more than 10 units of packed red blood cells.[3] In fact, it remains the leading indication for caesarean hysterectomy.[4] The bladder is the most frequently involved extrauterine organ in placenta percreta, and placenta percreta invading the urinary bladder is associated with substantial morbidity and mortality.[5]

Because placenta accreta is a potentially life-threatening obstetric condition, there is a need to perform postpartum hysterectomy in a safe and expeditious manner. Many of the previously described surgical approaches are associated with a risk of major haemorrhage; therefore, a retrograde hysterectomy from the pouch of Douglas would allow control of the bleeding and maximum separation of the bladder from the uterus before any excisional procedure begins.

Technique

Our new surgical technique for caesarean hysterectomy, which is based on our experience with the radical retrograde hysterectomy often required for ovarian cytoreductive surgery, was assessed in women with an antenatal diagnosis of placenta praevia/accreta (see Supplementary material, Video S1) treated between December 2008 and April 2014. Women with an antenatal diagnosis of placenta praevia/accreta were included in this study after providing written informed consent. Women who wanted to preserve their uterus were excluded.

Surgical technique

The woman is placed in the lithotomy position and the caesarean is performed by fundal hysterotomy away from

the placenta. The ligated umbilical cord and attached placenta are left within the uterus and the hysterotomy is closed with a continuous suture (for haemostasis). The uterus is exteriorised and kept under upward traction so that uterine vascular constriction can diminish blood loss. Direct handling or dissection at the placental site is avoided. The round ligaments are divided and ligated, and the broad ligaments are incised laterally and parallel to the infundibulo-pelvic ligaments to expose the retroperitoneum. The loose areolar tissue encountered in this space is carefully dissected parallel to the ureters and the pelvic sidewall vessels. Stepwise, the devascularisation procedure starts with ligature of the anterior divisions of the internal iliac arteries. Next, the utero-ovarian ligaments and tubes are divided and ligated bilaterally. The posterior vaginal fornix is exposed by placement of a sponge stick into the vagina, which is opened transversely, 1–2 cm below the cervicovaginal junction (Figure 1). Roger hysterectomy clamps are used to circumscribe the vagina, sequentially dividing and securing each pedicle with a suture ligature. This technique is similar to the radical retrograde approach used for en bloc resection of extensive pelvic disease, such as in women with ovarian cancer.[6] Caesarean hysterectomy is performed using the posterior retrograde approach,[7] in which the ureters are carefully identified, dissected and preserved through the anterior bladder pillar in order to keep them out of the field of dissection. The cervix is seized by Museux forceps and pulled up behind the uterus (Figure 2). The retrograde approach is continued by retracting the uterus sharply upward, exposing the remaining cardinal ligament attachments (with uterine vessels) medial to the ureters, uterosacral ligaments and bladder pillars, which are sequentially divided by clamps and secured with suture ligatures. The vesicouterine space is

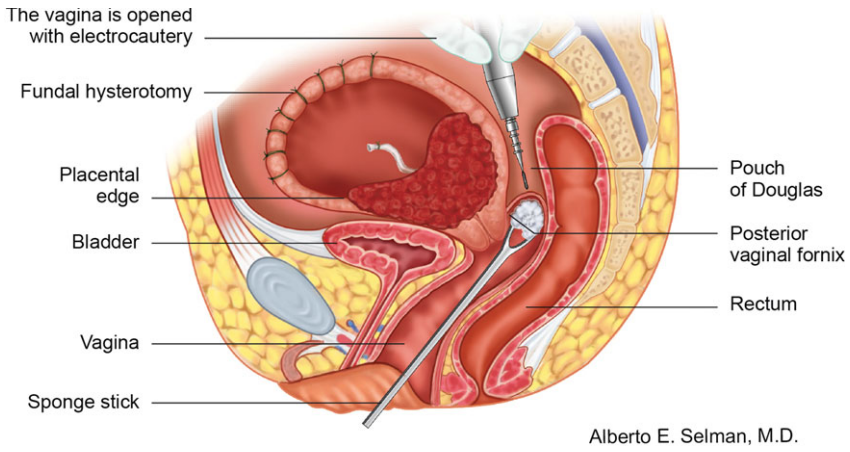

Figure 1. The posterior vaginal fornix is exposed and the vagina is opened transversely.

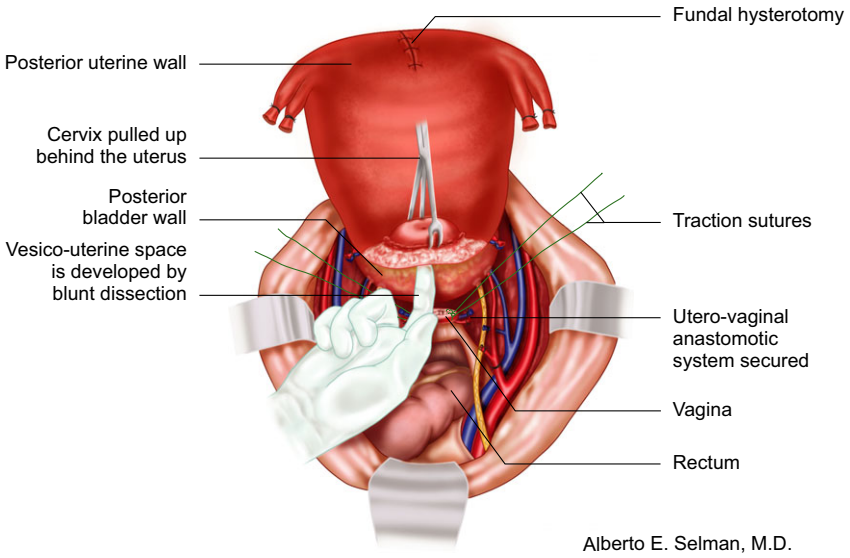

Figure 2. The vesico-uterine space is developed cephalad.

developed cephalad by blunt dissection (Figure 2) until the bladder is completely detached from the anterior aspect of the uterus or the lowermost extent of bladder invasion (usually above the trigone level) has been reached. If the bladder is involved, cephalad blunt dissection of the bladder is stopped. Cystotomy is particularly helpful for defining the dissection planes and determining whether resection of the posterior bladder wall is required. The extent and type of reconstruction may require simple closure of the bladder defect or ureteroneocystostomy followed by bladder repair. Aortic cross-clamping can be performed prophylactically in cases of suspected percreta or if the woman is haemodynamically unstable.

Experience

Eleven women with placenta praevia/accreta underwent surgery using this protocol (Table 1). The median patient age, gestational age, surgical time and hospital stay were 36 years (range 21–43), 36 weeks (26^{+2}–38), 180 minutes (131–235) and 4 days (3–6), respectively.

Before induction of general anaesthesia for the hysterectomy, all women underwent combined spinal–epidural anaesthesia for the caesarean delivery. Large-bore venous lines, an arterial line and a central venous catheter were placed to optimise monitoring and to ensure adequate vascular access in cases of possible haemorrhage.

Two out of the 11 women with major placenta praevia required blood transfusion. One needed three units and the other four units of packed red blood cells because of preoperative anaemia.

There were no intraoperative complications in any of the women. After the surgery, all women were transferred to the intensive care unit for first-day postoperative care. All women presented normal perfusion parameters and none required additional blood products. Women with vesical resection were discharged with a Foley catheter, which was removed 7 days after surgery. No postoperative complications were encountered using this approach. Specifically, there were no vesicovaginal fistulae or postoperative issues with micturition or bladder capacity. There were no reoperations or readmissions. Only one infant required prolonged neonatal intensive care due to severe prematurity. The mother in this case was a 21-year-old woman with a cervico-isthmic corporeal pregnancy that had to be interrupted at 26^{+2} weeks of gestation due to uncontrolled haemorrhage (Figure 3). Of the 11 women studied, there were six cases of placenta percreta; three, two and one of these women presented histological evidence of penetration to the bladder, invasion through the myometrium and invasion to the paracolpos (cervico-isthmic corporeal pregnancy), respectively. The remaining five women had placenta increta ($n = 4$) or accreta ($n = 1$).

Table 1. Clinical considerations, surgical treatment and placental pathology

Source	Antenatal diagnosis	Previous caesarean	Surgical treatment	Placental pathology
CH	G2P1, anaemia, accreta	1	SS, IMACC, PC	Percreta (bladder)
CH	G5P4, GDM, percreta	4	SS, IMACC, PC	Percreta (bladder)
CH	G2P1, anaemia, accreta	0	SS	Increta
CH	G6P4, pre-eclampsia, accreta	4	SS, IMACC, PC	Percreta (bladder)
CLC	G3P1, APH, accreta	1	SS	Percreta (uterus)
CH	G4P3, accreta	3	SS, IMACC	Increta
CLC	G2P1, accreta	1	SS*	Percreta (uterus)
CH	G3P0, GDM, accreta	0	SS	Increta
CLC	G2P0, APH, anaemia, accreta	0	SS	Increta
CLC	G3P2, accreta	1	SS	Accreta
CH	G3P1, CICP, APH, anaemia, percreta	0	SS, IMACC, PCO	Percreta (paracolpos)

*Pfannenstiel incision.
CH, clinical hospital; G/P, gravity/parity; SS, standard surgery (median suprainfraumbilical laparotomy, median fundal hysterotomy, posterior retrograde abdominal hysterectomy, hypogastric artery ligation); IMACC, inframesenteric aortic cross-clamping; PC, partial cystectomy; GDM, gestational diabetes mellitus; CLC, Clínica las Condes; APH, antepartum haemorrhage; CICP, cervico-isthmic corporeal pregnancy; PCO, partial colpectomy.

Discussion

Outcomes are improved when delivery of women with placenta accreta is accomplished in centres with multidisciplinary expertise and experience in the care of this pathology. Such expertise may include: maternal and fetal medicine; gynaecological surgery; gynaecological oncology; vascular, trauma and urological surgery; transfusion medicine; intensive care, neonatologists, interventional radiologists and anaesthesiologists; specialised nursing staff; and ancillary personnel. The specific credentials of the surgeon (e.g. gynaecological oncologist, general obstetrician–gynaecologist, maternal and fetal medicine specialist) are probably less important than consistent, on-going experience with cases of placenta accreta. In fact, most authorities

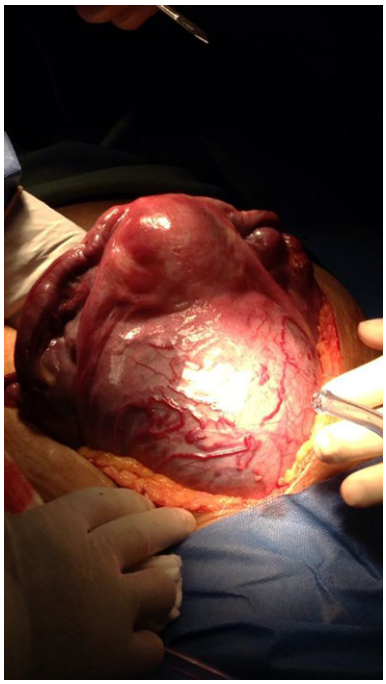

Figure 3. Cervico-isthmic corporeal pregnancy.

believe that outcomes are improved when the surgeon is comfortable with opening and exploring the retroperitoneal space.[8] Of note, this descriptive study only included women operated on with this new technique. Hence, the 11 women discussed are highly selected women taken from the total population of women afflicted with this pathology.

Blood loss during childbirth has been, and continues to be, a significant issue. However, the standard procedure for estimating obstetric bleeding has been found to be unreliable,[9] and a combination of direct measurement and gravimetric methods is the most practical. In addition, there may be failure to collect all the blood lost, and direct measurements and weight do not discriminate between blood and other types of fluid.[10] Hence, estimated blood loss must be used with caution as a quality indicator or as a variable in studies comparing complications. For clinical purposes, estimation of blood loss and measurement of postpartum haemoglobin is of low value and may lead to the wrong conclusions; accordingly, the estimated blood loss was not reported in this study.

The lower uterine segment, cervix and upper part of the vagina are supplied by a group of pelvic subperitoneal collaterals, originating from the internal pudendal artery, and by accessory collateral vessels from the internal iliac arteries, uterine artery and lower vesical arteries. Bilateral uterine artery ligation is ineffective in haemorrhages secondary to placenta praevia/accreta; in these cases, the bleeding needs to be controlled by a different technique.[11]

Ligation of the internal iliac arteries has been reported to greatly reduce the pulse pressure and to transform the pelvic arterial system into a venous-like system, with slow and sluggish blood flow.[12] Thereby, blood clots that are formed distal to the ligation remain in place, and this procedure also allows identification of the remaining individual bleeding vessels for ligation, which would otherwise be difficult.[13] I would like to make it clear that this is what we do; however, if the surgeon is not experienced with this procedure, it may add time and morbidity. The posterior approach could be used without performing internal iliac artery ligation. Although in this study arterial balloon catheters were considered to be unnecessary, owing to the potential complications associated with catheter placement such as infection, thrombosis and tissue necrosis, they could potentially be used instead of internal iliac artery ligation. The American College of Obstetricians and Gynecologists has reported that the current evidence is insufficient to make a firm recommendation on the use of balloon catheter occlusion versus embolisation to reduce blood loss and improve surgical outcome, but that individual situations may warrant their use.[3]

In conclusion, in the presence of anterior placenta praevia/accreta the lower uterine segment is commonly enlarged and hypervascularised, with the distorted anatomy and oedema of the surrounding structures making the cervicovaginal junction difficult to identify. Using our novel technique, the posterior vaginal fornix at the pouch of Douglas is exposed by placement of a sponge stick into the vagina. Once the cervicovaginal junction has been identified, the vagina is divided and sutured under direct vision. The flow from different types of vaginal anastomoses interconnected along the isthmic–vaginal borders or in the thickness of the cervicovaginal junction is interrupted, and uterine devascularisation is completed; consequently blood loss is rapidly diminished. The main improvement of this technique compared with standard hysterectomy is the cephalad blunt dissection of the bladder (which can be invaded), moving away from the trigone level, once the uterus is completely devascularised. This technique may enable safer surgery for women with anterior placenta praevia/accreta; however, analytical studies must be performed in the future to confirm its effectiveness and safety.

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Disclosure of interest
None declared. Completed disclosure of interests form available to view online as supporting information.

Contribution to authorship
AS has taken responsibility for all aspects of the work, including its conception, planning, performance, analysis and writing.

Details of ethics approval
The study protocol was approved by the Institutional Review Boards of Universidad de Chile Clinical Hospital (on 10 April 2013, reference number 578/13) and Clínica las Condes (on 19 January 2015).

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Video S1. Posterior retrograde abdominal hysterectomy in a women with placental invasion into the myometrium (increta). ■

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