

# Modified retrograde cesarean hysterectomy for placenta previa accreta

Sato Hiroshi, Taguchi Nao, Imai Saeko, Kawaharamura Kanako, Suzuki Takako, Hirose Masaya

## ABSTRACT

**Introduction:** The incidence of placenta previa accreta continues to increase with rising cesarean section rates. Massive bleeding and/or urinary tract injury can occur in cesarean hysterectomy for placenta previa accreta and the operation is one of the most difficult obstetric surgeries. We designed “modified retrograde cesarean hysterectomy” for placenta previa accreta with combination of useful measures that were reported previously. We report this maneuver and investigate its utility. **Case Series:** From January 2013 to February 2015, we performed “modified retrograde cesarean hysterectomy” in four Japanese pregnant women with placenta previa accreta who did not want to retain fertility. We retrospectively analyzed the medical records of these four cases. Mean blood loss during the operation was  $2128 \pm 639$  ml. Allogenic transfusion was performed in only one woman. A pathologic examination showed placenta accreta in three women, placenta increta in one woman. Placenta percreta was not found in any of the women. No intraoperative complication including urinary tract injury occurred. Postoperative course was

uneventful in all of the women. **Conclusion:** “Modified retrograde cesarean hysterectomy” can brought less maternal morbidity through avoidance of urinary tract injury. This operation is thought to be useful and safe for the patients with placenta previa accreta who do not need to preserve fertility.

**Keywords:** Cesarean section, Hysterectomy, Placenta accreta, Placenta previa

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## INTRODUCTION

The abnormal placental implantation causes placenta accreta in which the decidua basalis is missing. It is classified into three types histopathologically: placenta accreta where the chorionic villi are in contact with the uterine myometrium, placenta increta where the chorionic villi invade the uterine myometrium and placenta percreta where the chorionic villi penetrate the uterine serosa. Antecedent cesarean delivery increases the frequency of placenta previa in the following pregnancy. Moreover, prior cesarean delivery and placenta previa implanted on anterior wall of uterus are the strong risk factors of placenta accreta [1]. Massive bleeding and/

or the urinary bladder injury can occur in cesarean hysterectomy for placenta previa in such cases. Tan et al. reported that cesarean hysterectomy for placenta accreta was associated with significant maternal morbidity and risk of urinary tract injury was very high in placenta percreta [2]. Furthermore, removal of the uterus may not achieve complete hemostasis when massive and rapid bleeding occurs in dissection between the bladder and the uterus due to placental invasion and/or abundant engorged vessels. Dissection of the bladder from the uterus is performed in the early step of conventional hysterectomy and bleeding due to this procedure may be life-threatening. Therefore, cesarean hysterectomy for placenta previa accreta has been always challenging. Many authors reported various measures for cesarean hysterectomy for placenta previa accreta [3–5]. We constructed the procedures for cesarean hysterectomy in such cases with combination of their measures and named “modified retrograde cesarean hysterectomy”. “Modified retrograde cesarean hysterectomy” was performed in the following order.

After introduction of general anesthesia under lithotomy position, the neonate was delivered through a transverse fundal incision to avoid the placenta and the hysterotomy was closed without removal of the placenta. Bilateral ureteral catheterization under cystoscopy was performed by a urologist. The round ligaments, fallopian tubes and the proper ligaments of the ovary were cut. Bilateral ureters and internal iliac arteries were identified and isolated. Vessel-tapes were put around the bilateral internal iliac arteries for hemostatic control in massive bleeding (Figure 1). The fingers of an assistant operator were directed through the vagina to identify the posterior vaginal fornix. Immediately below the level of the cervix, the posterior vaginal fornix are incised and uterosacral ligaments are cut by a bipolar sealing device. Uterine vessels were divided along the uterus. The bladder was distended with 300 ml of diluted methylene blue. This maneuver made the edge of the bladder clearly visible. The incision in the vaginal wall was extended from the posterior wall to the lateral wall with a bipolar sealing device and cardinal ligaments were cut and ligated. At the level of anterior vaginal fornix, the tissue between the bladder and the vagina was dissected and a tunnel was created (lower uterine segment bypass) [4].

After incision of the anterior vaginal wall, only the bladder was attached on lower segment of the uterus, where placental invasion was suspected (Figure 2). The bladder was emptied and dissected from the uterus. Bladder injury was repaired if necessary. The vaginal canal was usually closed and the abdominal wall is normally repaired. These procedures are given in Table 1. From January 2013 to February 2015 we performed “modified retrograde cesarean hysterectomy” in four Japanese pregnant women with placenta previa accreta who don't want to keep fertility. In our hospital, we performed ultrasonography in all cases with placenta previa attached on cesarean scar.

Some characteristic findings such as placental lacunae, lack of a sonolucent zone and interruption of bladder line were reported [6]. In all cases, these signs were seen and placenta accreta was strongly suspected before 30 weeks of gestation. Cesarean hysterectomy for placenta previa accreta was performed at 34–36 weeks in order to avoid emergent operation. Barrett et al. reported that a scheduled delivery at 34 weeks of gestation was the preferred strategy [7]. In all cases, we consulted with urologist, anesthesiologist, neonatologist and other staff about the date of operation. We decided the date of operation when all of them we are available.

We report these four cases and investigate utility of “modified retrograde cesarean hysterectomy” for placenta previa accreta.

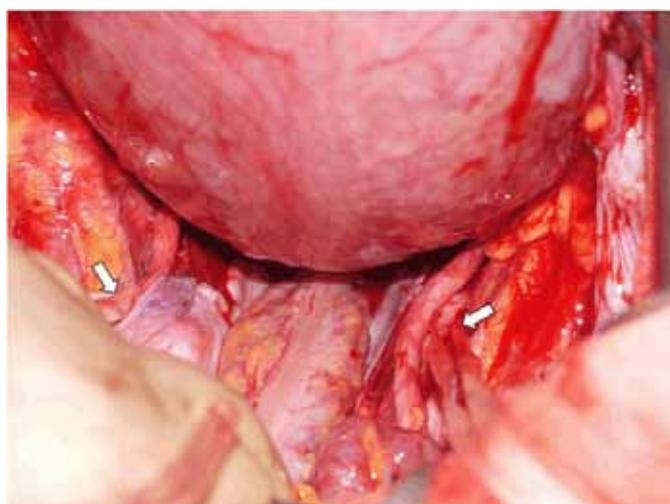


Figure 1: Photograph after cesarean delivery showing identification of bilateral ureters and internal iliac arteries around which vessel-tapes were put (arrow).



Figure 2: Photograph after incision of the anterior vaginal wall which is clamped with the forceps (arrow) showing that the uterus is attached only to the bladder.

Table 1: Summary of the procedures

1. General anesthesia under lithotomy position
2. Delivery through transverse fundal incision
3. Closure of hysterotomy
4. Bilateral ureteral catheterization
5. Cut of the round ligaments, the fallopian tubes and the proper ligaments of the ovary
6. Identification and isolation of the ureters and the internal iliac arteries
7. Incision of the posterior vaginal fornix and the uterosacral ligaments
8. Preparation of uterine vessels
9. Infusion of 300 ml of diluted methylene blue into the bladder
10. Cut of the cardinal ligaments
11. Incision of the vaginal wall from posterior to lateral
12. Dissection of the tissue between bladder and anterior vaginal wall
13. Cut of the anterior vaginal wall
14. Mobilization of the bladder from the uterus
15. Repair of the urinary tract injury if necessary
16. Closure of the vaginal cuff
17. Closure of the abdomen

## CASE SERIES

### Case 1

A 33-year-old female, para 2 (two previous cesarean sections) was managed from the first trimester of the pregnancy in our hospital. There was nothing particular on her past history and family history. She had major placenta previa which was attached on the previous cesarean scar. Placenta accreta was suspected based on ultrasonography. Modified retrograde cesarean hysterectomy was performed under general anesthesia at 36 weeks 5 days gestation. The blood loss during operation was 1610 ml and only autologous blood (preoperatively donated blood: 700 ml, re-used blood via cell saver: 800 ml) were transfused. The operation time was 252 min. No intraoperative complication including urinary tract injury occurred and postoperative course was uneventful. The histology revealed placenta increta.

### Case 2

A 39-year-old female, para 1 (one previous cesarean section) was managed from the first trimester of the pregnancy in our hospital. There was nothing particular on her past history and family history. Ultrasonography on the first trimester showed that the placenta was attached

on the cesarean scar which was thin myometrium. She had major placenta previa which was attached on the previous cesarean scar on the beginning of the third trimester. Placenta accreta was suspected based on ultrasonography. Modified retrograde cesarean hysterectomy was performed under general anesthesia at 34 weeks 6 days gestation. The blood loss during operation was 1570 ml and only autologous blood (preoperatively donated blood: 600 ml) was transfused. The operation time was 177 min. No intraoperative complication including urinary tract injury occurred and postoperative course was uneventful. The histology revealed placenta accreta.

### Case 3

A 28-year-old female, para 2 (two previous cesarean sections) was referred to our hospital for management of placenta previa with warning bleeding and regular uterine contraction at 24 weeks 3 days gestation. There was nothing particular on her past history and family history. She had major placenta previa which was attached on the previous cesarean scar. Placenta accreta was suspected based on ultrasonography. Modified retrograde cesarean hysterectomy was obliged at 33 weeks of gestation for warning bleeding and threatened preterm labor. The blood loss during operation was 2850 ml. The operation time was 241 min. In this case, autologous blood storage (preoperatively donated blood: 350 ml) was not sufficient. Allogenic transfusion (Red cell concentrates: 720 ml Fresh frozen plasma: 840 ml) was performed only in this case. No intraoperative complication including urinary tract injury occurred and postoperative course was uneventful. The histology revealed placenta accreta.

### Case 4

A 36-year-old woman, para 2 (two previous cesarean sections) was referred to our hospital for management of placenta previa at 27 weeks 1 days gestation. There was nothing particular on her past history and family history. She had major placenta previa which was attached on the previous cesarean scar. Placenta accreta was suspected based on ultrasonography. Modified retrograde cesarean hysterectomy was performed under general anesthesia at 35 weeks 6 days gestation. The blood loss during operation was 2480 ml and only autologous blood (preoperatively donated blood: 1400 ml) was transfused. The operation time was 185 min. No intraoperative complication including urinary tract injury occurred and postoperative course was uneventful. The histology revealed placenta accreta.

## DISCUSSION

Placenta previa implanted on the cesarean scar may cause placenta accreta, increta or percreta, leading life-threatening hemorrhage and urinary tract injury during

operation with or without hysterectomy [8]. Authors of previous reports have also devised various measures for cesarean hysterectomy for placenta previa accreta, including “posterior approach hysterectomy” by Price et al. [3] and “retrovesical lower uterine segment bypass hysterectomy” by Pelosi and Pelosi [4]. Price et al. performed “posterior approach hysterectomy” for two

women in whom placenta previa percreta was suspected [3]. In both women, they attempted to mobilize the bladder with placental invasion before the “posterior approach”. Unsuccessful mobilization of the bladder resulted in massive hemorrhage. Pelosi and Pelosi reported that entrance of lower uterine segment bypass was paravesical spaces 2 cm lateral to the uterus at the level of the vesicouterine fold [4]. These spaces may vary depending on the degrees of placental invasion and/or adhesion. Therefore, we applied both approaches. In “modified retrograde cesarean hysterectomy”, an approach from the cul-de-sac posteriorly and incrementally upward along the cervix (Figure 3) enables clarification of the position of the lower uterine segment and bladder. The entrance of the retrovesical lower uterine segment bypass is a space between a previous cesarean scar of the uterus suspected of placental invasion and uterovesical ligament (Figure 4). After identification of the ureter, division of cardinal ligaments and incision of posterior and lateral vagina, the entrance can be more easily and correctly identified. After incision of the anterior vaginal wall, the uterus is attached to the body only at the area where placental invasion is suspected. This maneuver enable us to begin control of bleeding from the bladder and repair of the bladder soon after resection of uterus. Consideration to use the same procedure to manage future cases with diagnosis of placenta percreta would be more appropriate.

The posterior approach is specific and the operation time may be a little longer than traditional cesarean hysterectomy. The mean operation time was 213.75 ±38.22 minutes including the time taking for ureteral catheterization. In addition, traction and flexion of an enlarged cervix during operation might cause bleeding of the placental edge (Cases 3 and 4). In these two cases, total blood loss during operation was more than 2000 ml. We believe that this hemorrhage may be controllable by cervical closure and compression by round forceps. This technique was reported by Matsubara et al. as the “holding the cervix” technique [5]. In the posterior approach, bleeding from the vaginal cuff may be increased compared with the normal approach because it takes more time to begin closure of the vaginal cuff. In all women, we used vessel-sealing devices for the incision of the vagina. Usefulness of vessel sealing devices for peripartum hysterectomy was recently reported [9]. The mean total blood loss during operation was 2128±639 ml. This is not decreased compared with previous reports [2, 10, 11]. Tan et al. reported that cesarean hysterectomy was performed in 13 cases with placenta accreta or increta without percreta and urinary tract injury occurred in five cases of them [2]. In our cases, no urinary tract injury occurred. Although number of cases was small, we could safely perform the modified retrograde cesarean hysterectomy without any urinary tract injury.

Some authors have reported “uterus-conserving” management for placenta previa accreta [12–14]. In these previous reports, placenta was spontaneously absorbed or delivered. Other authors have reported “step wise

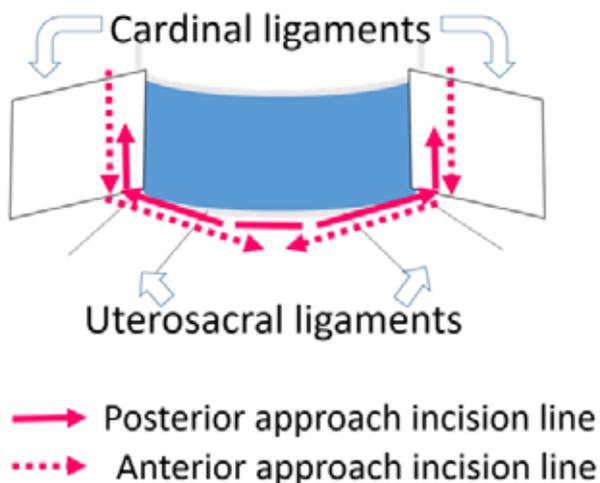


Figure 3: Schema of the uterus from the posterior view showing the difference between posterior approach incision (solid line arrow) and anterior approach incision (dotted line arrow).

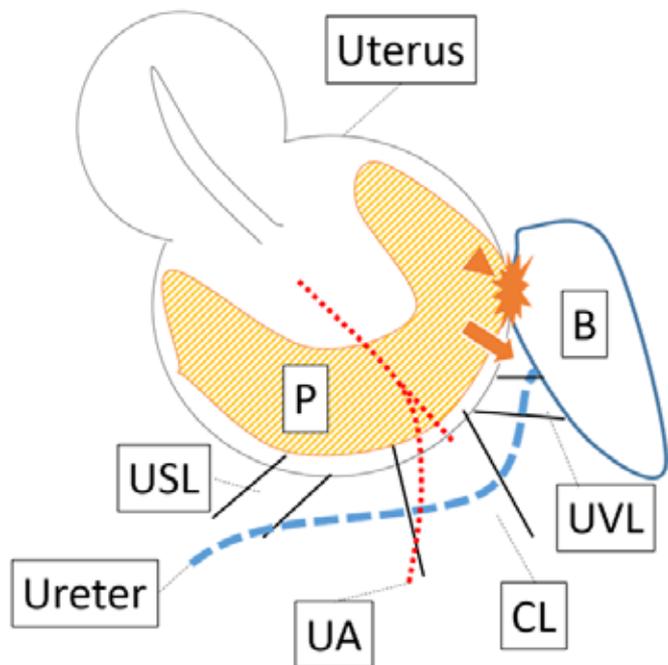


Figure 4: Schema of the uterus from the right lateral view showing entrance of retrovesical lower uterine segment bypass (arrow) which is a space between a previous cesarean scar of uterus, with suspicion of placental invasion (arrow head), and the uterovesical ligament.

Abbreviations P: placenta, B: urinary bladder, UA: uterine artery, CL: cardinal ligament, USL: uterosacral ligament, UVL: uterovesical ligament

management” in which total hysterectomy is planned several days after cesarean section [15]. In both types of managements, unexpected massive bleeding may occur [16]. At that time, obstetricians may need to perform transfusion and/or emergent hysterectomy. Cesarean hysterectomy for placenta previa accreta must be safely performed if obstetricians treat such patients as the last resort of saving maternal life. We applied and combined procedures that were previously reported by some authors in each step in cesarean hysterectomy to reduce the morbidity.

## CONCLUSION

When placenta previa accreta is suspected, appropriate management should be planned. “Modified retrograde cesarean hysterectomy” is useful and safe for patients with placenta previa accreta who do not need to preserve fertility. We hope that treatment strategies for placenta previa accreta will be further improved in the future.

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## Author Contributions

Hiroshi Sato – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Nao Taguchi – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Saeko Imai – Acquisition of data, Analysis and interpretation of data, Drafting the article, Final approval of the version to be published

Kanako Kawaharamura – Acquisition of data, Analysis and interpretation of data, Drafting the article, Final approval of the version to be published

Takako Suzuki – Acquisition of data, Analysis and interpretation of data, Drafting the article, Final approval of the version to be published

Masaya Hirose – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

## Guarantor

The corresponding author is the guarantor of submission.

## Conflict of Interest

Authors declare no conflict of interest.

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## REFERENCES

1. Eshkoli T, Weintraub AY, Sergienko R, Sheiner E. Placenta accreta: risk factors, perinatal outcomes, and consequences for subsequent births. *Am J Obstet Gynecol* 2013 Mar;208(3):219.e1–7.
2. Grace Tan SE, Jobling TW, Wallace EM, McNeilage LJ, Manolitsas T, Hodges RJ. Surgical management of placenta accreta: a 10-year experience. *Acta Obstet Gynecol Scand* 2013 Apr;92(4):445–50.
3. Price FV, Resnik E, Heller KA, Christopherson WA. Placenta previa percreta involving the urinary bladder: a report of two cases and review of the literature. *Obstet Gynecol* 1991 Sep;78(3 Pt 2):508–11.
4. Pelosi MA 3rd, Pelosi MA. Modified cesarean hysterectomy for placenta previa percreta with bladder invasion: retrovesical lower uterine segment bypass. *Obstet Gynecol* 1999 May;93(5 Pt 2):830–3.
5. Matsubara S, Kuwata T, Usui R, et al. Important surgical measures and techniques at cesarean hysterectomy for placenta previa accreta. *Acta Obstet Gynecol Scand* 2013 Apr;92(4):372–7.
6. Comstock CH, Bronsteen RA. The antenatal diagnosis of placenta accreta. *BJOG* 2014 Jan;121(2):171–81; discussion 181–2.
7. Robinson BK, Grobman WA. Effectiveness of timing strategies for delivery of individuals with placenta previa and accreta. *Obstet Gynecol* 2010 Oct;116(4):835–42.
8. Evsen MS, Sak ME, Soydine HE, Nur CF, Mehmet O, Gul T. Retrospective analysis of placenta accreta: management strategies--evaluation of 41 cases. *Ginekol Pol* 2012 Jul;83(7):501–4.
9. Rossetti D, Vitale SG, Bogani G, Rapisarda AM, Gulino FA, Frigerio L. Usefulness of vessel-sealing devices for peripartum hysterectomy: a retrospective cohort study. *Updates Surg* 2015 Sep;67(3):301–4.
10. Fitzpatrick KE, Sellers S, Spark P, Kurinczuk JJ, Brocklehurst P, Knight M. The management and outcomes of placenta accreta, increta, and percreta in the UK: a population-based descriptive study. *BJOG* 2014 Jan;121(1):62–70; discussion 70–1.
11. Matsuzaki S, Matsuzaki S, Ueda Y, et al. Placenta percreta with a vaginal fistula after successful management by uterine transverse fundal incision and subsequent cesarean hysterectomy. *Obstet Gynecol Sci* 2014 Sep;57(5):397–400.
12. Amsalem H, Kingdom JC, Farine D, et al. Planned caesarean hysterectomy versus “conserving” caesarean section in patients with placenta accreta. *J Obstet Gynaecol Can* 2011 Oct;33(10):1005–10.
13. Sentilhes L, Ambroselli C, Kayem G, et al. Maternal outcome after conservative treatment of placenta accreta. *Obstet Gynecol* 2010 Mar;115(3):526–34.
14. Khan M, Sachdeva P, Arora R, Bhasin S. Conservative management of morbidly adherent placenta - a

- case report and review of literature. *Placenta* 2013 Oct;34(10):963–6.
15. Sumigama S, Itakura A, Ota T, et al. Placenta previa increta/percreta in Japan: a retrospective study of ultrasound findings, management and clinical course. *J Obstet Gynaecol Res* 2007 Oct;33(5):606–11.
  16. Teo SB, Kanagalingam D, Tan HK, Tan LK. Massive postpartum haemorrhage after uterus-conserving surgery in placenta percreta: the danger of the partial placenta percreta. *BJOG* 2008 May;115(6):789–92.

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