CASE REPORT

Cervical tourniquet in case of uncontrollable haemorrhage during caesarean section owing to a placenta accreta

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SUMMARY

This case report describes a 38-year-old woman in whom a primary caesarean section for placenta previa was complicated by postpartum haemorrhage due to a placenta accreta. Despite tamponade with a Bakri balloon and placement of a B-Lynch suture, the amount of blood loss could not be effectively reduced. The blood loss was eventually minimised by the placement of a Penrose drain around the cervix as a cervical tourniquet. We think that a cervical tourniquet is an effective method of stopping haemorrhage during caesarean section, as shown in this case report, and we consider this technique to be a valuable addition to several existing methods through which fertility is preserved by preventing emergency hysterectomy.

BACKGROUND

Massive haemorrhage is the most important complication of an abnormally invasive placentation, and occurs most often after manual separation of the placenta from the decidual bed. It is still the leading cause of emergency hysterectomy even though conservative, fertility-preserving management is strongly preferred.¹ We present a case in which blood loss, during a caesarean section which was complicated by a placenta accreta, was managed by using a Penrose drain as a cervical tourniquet.

CASE PRESENTATION

Our case report concerns a 38-year-old woman (gravida three, para one) with a history of curettage for a missed abortion. Her previous delivery was complicated by postpartum haemorrhage due to an incomplete placenta, for which a manual placenta removal was performed. Because of persisting haemorrhage, a Bakri balloon was placed, followed by embolisation of the right uterine artery with spongostan injections and balloon occlusion of the right iliac artery. The total blood loss was 3200 ml. She was admitted to the intensive care unit for a period of 2 days.

The current pregnancy was complicated by a low-lying placenta, located 1 cm from the internal cervical ostium on the posterior wall of the uterus. During this pregnancy, hospital admission for vaginal blood loss was required twice; on both occurrences, the blood loss ceased spontaneously after bed rest. During the course of pregnancy, there were no signs of placenta accreta on ultrasound examination.

At 38-weeks gestation, an elective primary caesarean section was scheduled and a healthy baby was born. However, controlled cord traction was futile and manual removal of the placenta was only partly successful as a placental rest of approximately 10 cm remained in situ. As this residual placental tissue was densely attached to the uterine wall, and no cleavage plane could be found, it was suggestive of placenta accreta.

TREATMENT

In an attempt to stop the abundant bleeding from this residual placental tissue, a Bakri balloon filled with 180 ml water was placed inside the uterus and a B-Lynch suture using PDS 1.0 was placed around the uterus. However, as this combination of a compression suture and balloon tamponade did not sufficiently reduce the amount of blood loss, a Penrose drain was placed around the cervix—through two artificial openings in the ligament broad—and tightened. In this manner, the ascending branches of the uterine arteries were effectively compressed and the bleeding was reduced to minimal proportions. The caesarean section scar was then closed.

OUTCOME AND FOLLOW-UP

The total amount of blood loss was 3800 ml. After the administration of four packed cells and 2 g of fibrinogen, the haemoglobin level raised to 5.5 mmol/l and the patient remained circulatory stable. The following day, a relaparotomy was performed to remove the Penrose drain in order to restore the uterine blood supply. There were no signs of necrosis. Owing to uterine contractions, the B-Lynch was only loosely attached to the uterus and was therefore removed. The Bakri balloon was emptied and removed after which no substantial bleeding occurred. The patient was discharged from the hospital 7 days after the relaparotomy. Despite receiving prophylactic augmentin 625 mg three times a day for 10 consecutive days after the caesarean section, the patient presented to our outpatient clinic with fever 20 days after her surgery which was most likely caused by endometritis. Successful treatment was achieved with a 10 day course of erythromycin 500 mg four times a day.

Six weeks post partum, our patient was seen in our outpatient clinic for a standard postoperative check-up. Human chorionic gonadotropin values had normalised. Transvaginal ultrasound showed a placental rest of 2×2 cm for which we chose an

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expectative approach. Surprisingly, histology could not confirm the diagnosis of placenta accreta.

DISCUSSION

Several uterine-sparing techniques can be considered when facing excessive obstetric haemorrhage with the aim of preserving fertility. In the recent years, the use of a Bakri balloon and B-Lynch sutures has gained popularity. A combination of these two methods has shown to be successful in achieving haemostasis of haemorrhage during caesarean sections.² In our case, we used the combination of a Bakri balloon, a B-Lynch suture and a Penrose drain around the cervix. To our knowledge, no previous case report has been published about the use of the Penrose drain as a cervical tourniquet in the treatment of haemorrhage during caesarean sections. Application of a cervical tourniquet is, however, a well-known technique in gynaecological surgery for preventing excessive blood loss during myomectomy. Taylor *et al*³ showed that a tourniquet around the cervix reduces blood loss during a myomectomy. In this trial, a polyglactin suture was placed around the cervix and left in situ. After 6 months, there was no significant difference in Doppler resistance of the uterine artery compared to the control group. Ikechebelu *et al*⁴ placed a Foley catheter around the cervix during an open myomectomy. There was a significant decrease in blood loss and transfusion rate favouring the tourniquet group. We chose a Penrose drain for its elasticity, usability and because it could effectively compress the cervical vasculature. Nevertheless, in our case, the use of the Penrose drain necessitated a relaparotomy after 1 day to remove the potentially irritating latex device and—since latex does not resolve by time—to restore the major uterine blood supply. Therefore, an absorbable suture may offer advantages over the Penrose drain and may be considered to prevent relaparotomy. The tension of the suture will gradually diminish due to postpartum contraction of the cervix resulting in a decrease in the cervical circumference, and the obstructed uterine blood flow may likely be restored.

We believe that the cervical tourniquet is an especially useful technique in those cases where bleeding originates from the lower segment of the uterus. Haemorrhaging from the lower uterine segment is often difficult to stop with uterine compression techniques due to a decrease in muscular tissue and thus contractility of this area of the uterus. Physiological tamponade of the vascular remains of a low-lying placenta is thus hindered. We have the impression that in these cases medication given to increase the uterine contractility appears to be less effective. The effectiveness of the tourniquet can be explained by the fact that it effectively strangles the major blood supply (ie, the uterine artery) in this area. Although the tourniquet technique resembles the bilateral uterine vessel ligation as part of stepwise uterine devascularisation,⁵ because the ligation also stops the major blood supply to the lower uterine segment, we think that this method might be easier and faster to perform and, most importantly, is reversible, thus restoring the entire uterine blood supply. Furthermore, it can also be used to quickly control blood loss and gain time to perform other haemostatic procedures. Hereafter, the tourniquet may be removed if indicated.

In our case, the patient's history of embolisation, curettage and her diagnosis of a low-lying placenta put her at an increased risk for abnormal placentation. A few case reports have been published about abnormal adhesions after embolisation. In these cases, the uterine artery was embolised as a treatment for leiomyomas.⁶ However, no further research has been conducted about placentation after embolisation as a treatment for postpartum haemorrhage.

Although women who have had a curettage in the past have an increased risk of a manual placental removal or retained placenta, the relation to a placenta increta/accreta remains unclear.⁷ Another risk factor for a placenta increta is placenta previa. Miller *et al*⁸ reviewed all cases of a placenta accreta and found that in women with placenta previa, the risk of placenta accreta ranged from 2% with no previous caesarean deliveries to almost 39% in women with two or more previous caesarean deliveries. In our patient, no signs of placenta accreta were seen on ultrasound examination, and therefore no special precautions were taken before and during the caesarean section. It has to be noted, however, that a posterior localisation of the placenta makes an accurate diagnosis by ultrasound more difficult.

We chose not to administer methotrexate to our patient with a retained placenta as a review reported that methotrexate has no effect on the full-term placenta because the trophoblast cells will no longer be dividing.⁹ Another report showed that human chorionic gonadotropin levels fall at similar rates with or without methotrexate.¹⁰

In conclusion, in this case report, we have described that a cervical tourniquet can be effectively used to stop haemorrhage during caesarean section. We consider this technique as a valuable addition to the several methods that already exist to prevent emergency hysterectomy and preserve fertility.

Learning points

- ▶ A cervical tourniquet can be effectively used in case of haemorrhage during caesarean section, in particular, in case of blood loss that originates from the lower uterine segment.
- ▶ It can be used to quickly control blood loss and gain time to perform other haemostatic procedures.
- ▶ We used a Penrose drain, but an absorbable suture may be considered to prevent a relaparotomy for drain removal.

Competing interests None.

Patient consent Obtained.

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