

# A Novel Tourniquet Technique to Reduce Hemorrhage in Placenta Accreta and Allow Transportation of Patient to Tertiary Care Hospital

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## Abstract

Placenta accreta is an obstetrical complication that can result in life threatening hemorrhage if not managed with adequate care and cause high maternal morbidity. Caesarean hysterectomy is an effective method to control intra-operative bleeding; however, we present a case of placenta accreta that was diagnosed intra-operatively in our secondary set-up hospital. Owing to the lack of multidisciplinary team, bleeding was temporarily controlled by tying a tourniquet using a Foley's catheter around the lower uterine segment with the tourniquet left in-situ and patient was shifted to a tertiary care hospital. This novel tourniquet technique bought time to transport the patient, arrange for a multidisciplinary team needed for this patient's management, and reduce hemorrhage which directly determined maternal outcome.

**Keywords:** Placenta accreta • Cesarean hysterectomy • Tourniquet • Haemorrhage

## Introduction

Placenta accreta spectrum refers to placenta directly adheres to uterine myometrium and is further classified as placenta accreta, increta and percreta based on the degree of invasion into the myometrium. Penetration of trophoblastic villi into the entire thickness of myometrium and invasion into nearby organs such as bladder and rectum is diagnosed as placenta percreta [1]. The risk of placenta accreta spectrum increases with number of previous caesarean deliveries with 50-67% in women who have had three or more caesarean deliveries [2]. Antenatal diagnosis of placenta accreta is possible via ultrasound and MRI however around 1/3<sup>rd</sup> to 2/3<sup>rd</sup> cases remain undiagnosed. Major maternal complications arise primarily due to massive haemorrhage [3] with estimated mean blood loss of 3000-5000 ml in placenta accreta [4]. These risks are particularly high when caesarean section takes place in a facility that is not equipped with managing placenta accreta [5]. We here report a case of placenta percreta that was diagnosed intra-operatively in our secondary care hospital who's bleeding was secured by tying a simple tourniquet around the cervix and patient was transported to a tertiary care hospital 150 km away to proceed with caesarean hysterectomy.

## Case Report

A 30-year-old, G3P2\*0, previous 2 caesarean section born 3 and 1 year ago respectively with no antenatal care presented to our emergency department at 37+ weeks gestation with lower abdominal pain. She only had an ultrasound report which showed gestational age of 36 weeks and placenta was localized fundus-posteriorly. There were no signs of placenta accreta spectrum on ultrasound examination. An urgent CBC was sent and her haemoglobin was 9.5 gm/dl. The on-call surgeon made a decision for emergency caesarean section owing to a raised pulse (130 bpm) with previous scar in labour and to avoid rupture of the uterus. At the time of emergency caesarean section, the

placenta was found to be anterior and low-lying. Bladder was found higher up which was carefully separated and pushed down. A transverse incision on the uterus was given and a healthy male baby weighing 2800 gm was delivered with an APGAR of 7 and 8 at the 1<sup>st</sup> and 5<sup>th</sup> minute respectively. Controlled cord traction was applied to deliver the placenta but it failed as placenta was densely adherent to the uterine wall. Part of the placenta was in lower uterine segment and almost completely embedded in myometrium and serosa. Manual extraction of this invasive placenta was impossible.

In an attempt to stop the abundant bleeding from this adherent placental tissue, a 16 F Foley's catheter tube was tied around the cervix, 3-4 cm anterior to cesarean section incision. Bladder was pushed as down as possible by opening the uterovesical fold of the peritoneum. In this manner, the ascending branches of uterine arteries were effectively compressed and bleeding was reduced as much as possible. Uterus was closed back and Foley's catheter left in situ to avoid further bleed and to timely transfer patient to a tertiary care hospital for multidisciplinary management. Estimated blood loss was 1000 ml and intraoperative vitals were as follows: BP: 70/40 mmHg, Pulse: 121 bpm, RR: 18/ min, O<sub>2</sub> saturation: 99%. Patient remained vitally and hemodynamically stable in the tertiary care hospital. She underwent a re-laparotomy the following day (within 12 hours of 1<sup>st</sup> surgery) to remove Foley's catheter and perform caesarean hysterectomy. A multidisciplinary team was present and on board comprising of senior gynaecologists, anaesthesiologist, haematologist and laboratory staff. Patient bled profusely after opening the tourniquet. Bladder was easily separated and caesarean hysterectomy with right salpingectomy and left salpingo-oophorectomy done owing to placenta percreta. The total amount of blood loss was 2000 ml (1000 ml in first surgery). After the administration of 3 packed red cells, the haemoglobin level was 7.2 gm/dl and the patient remained hemodynamically stable. Patient was discharged on 4<sup>th</sup> post-operative day and was seen in our hospital on 12<sup>th</sup> postoperative day for standard post-operative check-up and removal of stitches. Patient was further managed for correction of anemia.

## Discussion

This patient presented in our hospital which is a secondary set-up for maternal and children healthcare. The hospital is located approximately 150kms from the nearby largest city where up to the mark tertiary care facilities are available. Placenta accreta spectrum disorder when diagnosed peri-operatively can potentially lead to massive hemorrhage and increase morbidity and mortality of patient if not managed promptly [6]. Hence these patients should be operated under multidisciplinary team due to anticipated blood

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loss and the need for potential resuscitation and blood transfusion [7]. This patient was an un-booked case who had presented to our emergency care with deteriorating vitals and previous scar in labour with no ultrasonic features of placenta accrete. This made the on call surgeon proceed with emergency caesarean section. As the placenta was localized fundus-posterior on ultrasound examination, no special measures and precautions were taken prior to or during the caesarean section for e.g., blood products. Peri-operative findings of placental invasion suggested the diagnosis of placenta percreta which required an emergency obstetric hysterectomy. Patient had to be transferred under experienced multidisciplinary team for obstetric hysterectomy.

As the patient was profusely bleeding from placenta and was getting hemodynamically unstable (BP: 70/40 mmHg, pulse: 136 bpm), therefore a previously described simple tourniquet technique was applied [8] which quickly secured hemostasis and cleared surgical field. However, this simple tourniquet technique involved using a Foley's catheter instead of atraumatic deBakey vascular clamps. This had multiple advantages over other hemostatic techniques: Foley's catheter was readily available; it was easy and quick to perform and did not require special expertise given the size of our hospital. Furthermore, there was no bladder involvement which reduced the risk of tourniquet slipping over the placental bed. Foley's rubber tube is ideal when it has to be left intra-abdominally for longer hours [9] that allowed time for transportation of patient to tertiary care hospital, calling experienced surgeon and arranging blood products for transfusion. This tourniquet technique reinforced the initial rationale of performing emergency caesarean section: To reduce maternal mortality and morbidity. Effective bleeding control in this patient directly determined maternal outcome and reduced total blood loss to 2000 ml as opposed to more than 3000 ml mentioned in various literature [4,10].

## Conclusion

In conclusion, various haemostatic techniques have been described each having its own indications, expertise and availability of necessary instruments. In this case report, we present that using a Foley's catheter as a simple cervical tourniquet can effectively reduce haemorrhage, in particular in case of blood

loss originating from the placenta. This valuable technique can buy time for surgeon to convert emergency caesarean hysterectomy to elective caesarean hysterectomy.

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