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Successful use of balloon tamponade in the management of postpartum hemorrhage in a case of bicornuate uterus

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Abstract

Worldwide 50%–70% of all cases of maternal morbidity have been attributed to postpartum hemorrhage. This report discusses a case of bicornuate uterus in a term pregnancy. The delivery was by cesarean section, which was followed by massive postpartum hemorrhage, managed successfully with balloon tamponade. This is the second reported case of successful management of post partum hemorrhage in a bicornuate uterus with balloon tamponade. A 22-year-old primigravida at 39 weeks of gestational age presented with vaginal leaking of clear fluid. Cesarean section was done due to meconium stained liquor in early labor; with an incidental finding of bicornuate uterus followed by massive postpartum hemorrhage managed successfully with balloon tamponade. The use of uterine balloon tamponade as an effective method to control postpartum hemorrhage has been studied extensively, but use in cases of hemorrhage associated with uterine malformations has not been reported much in literature. Use of uterine balloon tamponade in case of uterine malformations has been highlighted in our case as an effective non-surgical method to control hemorrhage.

Keywords

Postpartum hemorrhage, balloon tamponade, uterine atony

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Introduction

Worldwide 50%–70% of all cases of maternal morbidity have been attributed to postpartum hemorrhage.^{1–4} Risk factors for postpartum hemorrhage in pregnant women need to be identified earlier in their course of care, and subsequent plan and preparation for delivery is paramount to avoid this morbidity. Uterine atony is the commonest cause of postpartum hemorrhage and is responsible for 80% of the cases.⁵

In all, 1.5% of female population has some form of congenital uterine anomaly (range: 0.1%–3%). Bicornuate uteri represent 25% (range: 10%–39%) of Mullerian duct anomalies.^{6,7} It is possible that this figure is an underestimate, since subtle abnormalities often go undetected. Women with congenital malformations of uterus usually have higher incidence of complications during pregnancy and delivery. The association of postpartum hemorrhage with uterine malformations and its subsequent non-surgical managements have not been elaborately discussed in evidence-based literature. Management of postpartum hemorrhage due to uterine atony involves administration of uterotonics followed by uterine packing and balloon tamponade.

This report discusses a case of bicornuate uterus with pregnancy carried to term delivered by cesarean section due

to obstetrical reasons. Patient suffered from a massive postpartum hemorrhage which was then successfully managed with uterine balloon tamponade. It bears the significance of being one of the very few reported cases of successful non-surgical management of postpartum hemorrhage in a bicornuate uterus with balloon tamponade.

Case presentation

A 22-year-old primigravida, presented in labor room at 39 weeks of gestation with complaints of vaginal leakage of clear fluid and no palpable uterine contractions. She

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Figure 1. Bicornuate Uterus after Cesarean delivery.

was booked at the hospital at 14 weeks of gestation and had regular antenatal checkups. She had no significant past medical or surgical history. All her antenatal investigations and obstetrical ultrasounds were done, and there were no uterine anomalies mentioned in dating and anomaly scans. She was left to progress as spontaneous labor. Labor was stimulated after 12 h with tablet Prostin E2 vaginally, 2 doses 6 h

apart. During her intrapartum course, she developed raised blood pressure of 160/110 mmHg with urine albumin of 2+. Antihypertensives were started and positron emission tomography (PET) profile was sent which came out to be normal. Further during the course of her labor, fetal heart rate tracing started showing variable decelerations with grade 2 meconium stained liquor. The cervix was dilated up to 3 cm only. The decision was then made by primary physician to proceed for emergency cesarean section. Cesarean was conducted by attending physician and instructor on call. The baby was delivered with good apgar scores followed by delivery of placenta and membranes. The uterus was exteriorized and the incidental finding of heart shaped (bicornuate uterus) was noted (Figures 1 and 2).

Case management

The first layer of uterus was closed with a running suture; ballooning up of lower segment was noted. Immediate vaginal examination was performed to assess for vaginal bleeding which showed vagina and lower segment full of clots and approximately 800 mL of clots were removed manually. Syntocinon infusion of 40 units was commenced and repeated intravenous (IV) bolus of 10 units Syntocinon was given twice. Misoprostol 800 µg placed per rectally. Bimanual uterine massage was continued but complete uterine atony of pregnancy carrying horn of uterus was observed.



Figure 2. Heart Shaped (Bicornuate) Uterus After Cesarean Delivery

Patient's vitals started deteriorating, with blood pressure of 80/40 mmHg and pulse rate of 120–130/min despite fluid resuscitation and conservative management. It was then decided to proceed for uterine balloon tamponade in the form of a condom catheter. Uterine incision was reopened, balloon tamponade inserted vaginally and its placement ensured in the right horn, 500 mL of saline was used to inflate balloon. Uterine closure was done routinely and hemostasis secured and assured. Abdomen closed in reverse order. Estimated blood loss was about 2000–2500 mL. Two units of packed red blood cells and two units of fresh frozen plasma (FFP) were transfused in immediate postoperative period. Hemoglobin on the date of surgery dropped down to 6.4 g/dL from preoperative level of 11.4 gm/dL. Repeat hemoglobin on second day of surgery was static at 6.3 gm/dL, so two more packed red blood cells were transfused. The balloon tamponade was retained for 24 h and IV broad spectrum antibiotics were continued. The balloon gradually deflated and removed on first postoperative day and vaginal bleeding was found to be normal. Patient was discharged on fourth postoperative day in a stable condition and was found to be in a good state of health in her postoperative outpatient follow-up visit on eighth day.

Discussion

In all, 25% of all maternal deaths occurring worldwide are attributable to obstetric hemorrhage which in turn is the top most direct cause of maternal mortality.⁸ It occurs in more than 10% of all births and is associated with a 1% case fatality rate.⁸ In low resource countries, postpartum hemorrhage continues to be the leading cause of maternal mortality. Obstetric hemorrhage is responsible for 34% of

maternal deaths in Africa, 31% in Asia, and 21% in Latin America and the Caribbean and among those who survive postpartum hemorrhage, approximately 12% will have severe anemia.⁹

Immediate and timely action is the key to saving lives in the instances of postpartum hemorrhage. Different strategies involved include uterotonic drugs at the top of the list, but sometimes these drugs fail or are not available. While resorting to second line of action, a combination of surgical and mechanical methods are available in low-resource settings. Current Canadian,¹⁰ British,¹¹ and American¹² obstetrics society guidelines recommend contemplation of uterine tamponade before other surgical interventions in cases of PPH that are refractory to medical therapy. Options for balloon tamponade include the Foley catheter,¹³ Sengstaken-Blakemore tube,¹⁴ Rusch urologic balloon,¹⁵ Bakri Postpartum Balloon (Cook Medical, Spencer, IN),¹⁶ condom catheter,¹⁷ and the BT-Cath.

The use of uterine balloon tamponade as an effective method to control postpartum hemorrhage has been studied extensively, but its use in hemorrhage associated with uterine malformations has not been reported much in literature.

In this case, despite administering uterotonics, the ongoing massive hemorrhage and the evident atonic right uterine horn led us to the decision of carrying on with uterine tamponade with a condom catheter in preference to other surgical resorts like B lynch suture or arterial devascularization for control of hemorrhage. The placement of catheter under vision into the right horn was also the key in controlling the hemorrhage. The non-surgical method of placement of balloon device inside the uterine cavity and then slow application of pressure to the uterus by the fluid inside the balloon due to tamponade effect is effective in controlling hemorrhage, and it saves the patient of the morbidity and risks from surgical procedures, which was evident in our patient.

Thus, we can say that implementation of standard protocols is the key in management of these critical situations, but as there are no evidence-based guidelines for managing postpartum hemorrhage in patients with uterine malformations, reporting of these cases can help in devising a treatment algorithm. Intrauterine balloon tamponade should be adopted as part of the management for massive postpartum hemorrhage in local obstetric units.

Conclusion

Most cases of severe PPH can be prevented if the bleeding is controlled and managed immediately. Reducing death and morbidity due to PPH requires various evidence-based approaches to be employed effectively. Uterine balloon tamponade has emerged as a promising approach among these methods. Its use in cases of uterine malformations has been highlighted in our case as an effective non-surgical method to control hemorrhage.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical approval to report this case was obtained from *Ethical Review Committee of Agha Khan University Hospital Pakistan 5109-Obs-ERC-17*.

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Informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

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