Bakri balloon for the management of placenta praevia: Retrospective study (Protocol)

Peer review status:
No

Corresponding Author:
Dr. Fatima Siddiqui,
Intern, Madinah Maternity and Children Hospital - Saudi Arabia

Submitting Author:
Dr. Mohammad Othman,
Assistant Professor, Al-Baha University, Saudi Arabia, Al-Hada - Saudi Arabia

Other Authors:
Dr. Fadwa Alahmadi,
Senior Resident Obstetrics and Gynaecology, Madinah Maternity and Children Hospital - Saudi Arabia
Dr. Lamia Aljaiar,
Consultant Obstetrician and Gynecologist, Madinah Maternity and Children Hospital - Saudi Arabia

Article ID: WMC005037
Article Type: Research Protocol
Submitted on: 12-Dec-2015, 01:10:59 PM GMT   Published on: 14-Dec-2015, 06:00:49 AM GMT
Article URL: http://www.webmedcentral.com/article_view/5037
Subject Categories: OBSTETRICS AND GYNAECOLOGY
Keywords: Bakri Balloon, Placenta Previa, Tamponade, Haemorrhage, B Lynch, Hysterectomy

How to cite the article: Siddiqui F, Alahmadi F, Aljaiar L, Othman M. Bakri balloon for the management of placenta praevia: Retrospective study (Protocol). WebmedCentral OBSTETRICS AND GYNAECOLOGY 2015;6(12):WMC005037

Copyright: This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC-BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Source(s) of Funding:
None

Competing Interests:
None Known

Additional Files:
Figure 1
Figure 2
Figure 3
Bakri balloon for the management of placenta praevia: Retrospective study (Protocol)

Author(s): Siddiqui F, Alahmadi F, Aljaair L, Othman M

Abstract

Placenta previa is frequently associated with severe obstetric hemorrhage. According to the degree of invasion of the placenta into the uterine wall placenta previa may be accreta, increta or percreta. Incidence of adherent placenta is 1 in 2500 deliveries. Added to that, there is a dramatic increase in the incidence of placenta previa and placenta accreta due to the increasing rate of cesarean delivery combined with increasing maternal age. Placenta previa usually associated with uterine atony, bleeding from the lower flap of the uterine wall, and may cause sever postpartum hemorrhage.

A lot of methods used to control bleeding from the placenta previa gravid uterus intraoperative and postoperative. Bakri balloon was used for the first time in 1992, and was approved as one of the primary support tools in treating PPH. A number of recent reports have described the successful use of balloon tamponade to manage hemorrhage from the lower uterine segment due to placenta praevia accreta.

This is a retrospective study aimed to evaluate the outcomes of uterine tamponade using a Bakri balloon for management in cases of placenta previa during caesarean deliveries.

Background

Placenta praevia is an obstetric complication in which the placenta is inserted partially or wholly in the lower uterine segment [1]. It is associated with maternal mortality and significant increase in maternal morbidities including massive hemorrhage, infection, adjacent organ damage, and emergency hysterectomy [1, 2]. Placenta praevia occurs in approximately 4.8 of every 1,000 pregnancies [2]. Women with placenta praevia often present with painless, bright red vaginal bleeding [3]. This commonly occurs around 32 weeks of gestation, but can be as early as late mid-trimester [4]. Exact cause of placenta praevia is unknown. It is hypothesized to be related to abnormal vascularisation of the endometrium caused by scarring or atrophy from previous trauma, surgery, or infection [1, 2, 4, 5].

Normally, the placenta adheres only to the decidua basalis, thus it separates smoothly from the wall of the uterus after delivery [6, 7]. Placenta accreta exists when the chorionic villi penetrate through the decidua basalis into the myometrium. Morbidly adherent placenta is three types according to the degree of invasion of the placenta into the uterine wall. The placenta is called accreta when it invades the myometrium superficially. Placenta increta exists when the chorionic villi invade the myometrium more deeply. Placenta percreta involves invasion of the placenta to the uterine serosa, and this might involve other nearby organs such as the urinary bladder or rectum (Figure 1) [4, 8].

Incidence of adherent placenta is 1 in 2500 deliveries [9-11]. Currently, there is dramatic increase in the incidence of placenta previa and placenta accreta due to the increasing rate of cesarean delivery combined with increasing maternal age [7, 12, 13]. An important risk factor for placenta accreta is placenta previa in the presence of a uterine scar [8]. Placenta previa is an independent risk factor for placenta accreta [1]. Additional reported risk factors for placenta accreta include maternal age and multiparity, other prior uterine surgery, prior uterine curettage, uterine irradiation, endometrial ablation, Asherman’s syndrome, uterine leiomyomata, uterine anomalies, hypertensive disorders of pregnancy, and smoking [11, 14, 15].

Placenta previa usually associated with uterine atony, bleeding from the lower flap of the uterine wall, and invasive placentation can cause postpartum hemorrhage [12, 16]. Intraoperative management options to control hemorrhage in placenta previa patients include bimanual uterine compression, implantation site compression with sutures, uterine arterial ligation, B lynch sutures, pelvic arterial embolization and hysterectomy. Added to that, leading to prolonged hospitalisation, admission to an intensive care unit and socio-economic costs [3, 9, 17].

Arterial ligation and different types of compression suture have a low success rate among inexperienced surgeons [3, 8]. Pelvic arterial embolization requires high medical costs and sophisticated facilities [5, 8]. On the other hand, hysterectomy has high morbidity
and mortality rates and results in fertility loss. Therefore, other minimal to noninvasive procedures are needed to treat intraoperative and postpartum hemorrhage and preserve the uterus [4, 10, 18].

One of the earliest methods of achieving a tamponade effect was by uterine packing [5, 18]. Sterile gauze was always used for uterine packing [5, 10]. Recently, balloon technology has been used to tamponade uterus to control hemorrhage [1, 10]. This involves inserting a rubber or silicone balloon into the uterine cavity and inflating the balloon with normal saline. The balloons include the Sengstaken–Blakemore tube, the Bakri balloon, the Rusch balloon, Foley catheters and the condom catheter balloon (Figure 2) [1, 2, 5].

In 1992, Dr Younes Bakri introduced intrauterine balloon tamponade for the treatment of obstetric hemorrhage during cesarean delivery [1, 5, 7]. Both the International Federation of Gynaecology and Obstetrics (FIGO) and the International Confederation of Midwives (ICM) have approved the balloon as one of the primary support tools in treating PPH [5, 6]. A number of recent reports have described the successful use of balloon tamponade to manage hemorrhage from the lower uterine segment due to placenta praevia accreta [3, 8, 19].

Bakri balloon is a silicone, obstetrical balloon of a 24-French, 54-cm long, silicone catheter with a filling capacity of 500-mL [5, 7]. Ductile shape allows it to conform to uterine anatomy and shape. Added to that, it allows for hemostatic cushion application and limits clot adhesion. The large diameter lumen in the shaft and multipored, nonabrasive tip allows for constant drainage, so an ongoing uterine hemorrhage does not go undetected post-application [5-7]. Once deflated, the Bakri Balloon is easily removed transvaginally without the need for an additional surgical procedure. It is usually kept for 24 hours, but may be removed sooner upon physician determination of hemostasis or the need to apply more aggressive treatment [5, 6].

The present study aimed to evaluate the outcomes of uterine tamponade using a Bakri balloon for management in cases of placenta previa during cesarean deliveries.

Methodology

This is a retrospective study, will be carried out in Maternity and Children Hospital (MCH), Madinah, Saudi Arabia. Placenta praevia patient records will be identified and data will be extracted from placenta previa patient’s records that were operated in the hospital from September 2012 to September 2015. Due to the retrospective nature of the study, informed consent is not necessary but patient records will be de-identified prior to analysis. This study was approved by Madinah MCH Research Committee.

Madinah MCH is a tertiary hospital where medical care is given free of charge. MCH cover the whole region of Madina which is 151,990 km2 (58,680 mi2), with a total multi ethnic population of 1,977,933. MCH lies in Madina which is the capital of the region and the second holiest city in Islam (Figure 3) [20]. MCH average number of deliveries is 15,000 per year, and caesarian section rate is 21%.

Placenta previa was defined as a condition where the placenta lies low in the uterus, while partially or completely covering the cervix. The patients were diagnosed with placenta previa by RICS-9-D transvaginal probe and C4-8-D transabdominal probe using Voluson E6 ultrasound system (GE Healthcare) in the third trimester. Placenta accreta is diagnosed using gray scale ultrasound and the suggestive signs of placenta accreta were presence of placental vascular lacunae, loss of a sonolucent area, interruption of bladder-uterine serosa and visualization of a focal protruding mass between the placenta and bladder. Diagnosis were confirmed by Magnetic resonance imaging (MRI) within 1 week of the ultrasound and intraoperative.

All patients received general anesthesia for cesarean section. At the time of cesarean section, postpartum hemorrhage was initially managed with Oxytocin 10u IM and 40 units in 500ml normal saline at 125ml/hour if the uterus is relaxing intermittently. In refractory cases, 0.1 mg Carboprost trimthamine given intravenously. Next step if bleeding continued were to take figure 8 stitches in the bleeding site of the placental bed. Bakri balloon catheter insertion was performed in cases of more than 1000 mL postpartum hemorrhage and uncontrolled bleeding by previous steps. The Bakri balloon was inserted through the cesarean section incision or transvaginally according to cervical opening. After proper placement of the catheter, the balloon was partially inflated with 50–100 mL of sterile normal saline. After closure of the uterus and caesarian section scar balloon was further inflated up to 300-500 mL until the blood draining through catheter is significantly decreased. Post-balloon application, low-dose intravenous oxytocin infusion was maintained for 24 hours. The drainage amount...
was checked hourly for the first 6 hours and if < 100 mL/h, every 4 h thereafter. The decision to remove the drain was made the following day. Failure of Bakri balloon tamponade was defined as continuous uterine hemorrhage after proper placement and inflation of the balloon catheter, with the need for additional intervention to control the bleeding.

Outcomes include demographic characteristics of the participants (nationality, age, parity, gestational age at time of diagnosis and at time of caesarian section, and history of previous uterine operations), need for blood transfusion, failure of the balloon, need for further management, duration the balloon kept in, obstetric complications, neonatal morbidity, hospital course post-operative, follow up and progress afterward. Simple descriptive analysis will be used.

References