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Abstract

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Pregnancies following the use of balloon tamponade technology in the previous pregnancy



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Introduction:

Evidence-based data depicts that various pharmacological agents should be used as a first line approach in the management of PPH after rubbing up the uterus. If these first line uterotonics (FLU) are unsuccessful, various second-line approaches (SLA) have been advocated including balloon tamponade technology.¹

Although many factors are considered when deciding which SLA is/are to be used, the parity of the mother and her potential future fertility is an important consideration. Consequently, hysterectomy is not always the first choice in women of low parity. The belief is that by sparing the uterus, a patient's future fertility is preserved (Table 1).²

Despite the increasing number of publications demonstrating an effective use of the uterine-specific Bakri balloon (Cook Medical, Bloomington, USA), few publications have commented on subsequent pregnancies in such cases (Fig. 1).

Four cases are described in which a subsequent pregnancy occurred following the use of a Bakri balloon that was solely used as a SLA in the management of PPH when FLU failed. These examples were identified from a personal case series of over 30 cases in which a Bakri balloon was used.³

Case 1:

Index pregnancy

A 26 yr old Jehovah's Witness, with an uncomplicated first pregnancy, presented in established labour at 39 weeks gestation. Following the vaginal birth of her baby and placenta, profuse PPH occurred. Despite the use of 10iu im oxytocin, 250ug ergometrine and 40iu oxytocin infusion, bleeding persisted. A combination of an atonic uterus, cervical/vaginal trauma was identified in the operating theatre. A Bakri balloon was insufflated with 450mls N-Saline (in order to achieve a positive tamponade test), together with the appropriate repair of the genital tract trauma. Estimated blood loss (EBL) was 2.5l. The balloon was removed within 24hrs with continual oxytocin infusion. The patient was discharged on day 4 and was seen at 6 weeks with an ultrasound scan (USS) that was reported as "normal". In addition, normal menses returned following cessation of breast feeding.

Subsequent pregnancy:

Eighteen months later, this woman presented at 6 weeks gestation. At 39⁺¹ weeks gestation, she had a social induction of labour using ARM, due to living at a distant location with respect to the main hospital. Four hours later, she birthed her baby with a first degree perineal tear that eventually was sutured. Active management of the third stage together with a 40 IU syntocinon infusion was commenced as previously planned throughout her pregnancy.

Despite this, a subsequent trickle of blood ensued that was managed with PR misoprostol (800mcg) and IM (250mcg) ergometrine. A total estimated blood loss of 1000mls was recorded. The patient was discharged on the second day following delivery, after breast-feeding was established.

References:

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- ³Georgiou, C (2012). Using the uterine-specific Bakri balloon in the management of PPH in *A Comprehensive Textbook of Postpartum Hemorrhage: An essential clinical reference for effective management* (2nd Edition). Edited by: Sir Sabaratnam Arulkumaran, Mahantesh Karoshi, Louis G. Keith, Andre B.Lalonde and Christopher B-Lynch

CASE 2:

Index pregnancy

A 28yr old nulliparous woman with pregnancy induced hypertension requiring pharmacological treatment (labetolol 100mg, twice daily) was admitted in early labour at 37⁺⁵ weeks gestation. Following the birth of her baby, a retained placenta was manually removed piecemeal.

A PPH secondary to an atonic uterus ensued. Despite the use of first line uterotonics, a Bakri balloon, insufflated to 400mls was required in order to achieve a positive tamponade test. The final EBL was 3500mls. A syntocinon infusion (40iu oxytocin) was continued until the Bakri balloon was removed, within 24 hrs of placement. Two units of blood were required. The patient was discharged on Day 4 and was seen in an outpatient setting at 6 weeks, whilst still breast-feeding. An USS at this stage revealed a uterus which was "unremarkable in appearance". The histopathology of the placenta was reported as normal and without evidence of placenta accreta. Regular normal menses commenced when breast-feeding ceased at 10 weeks.

Subsequent pregnancy

Twenty-three months later this woman presented in her second pregnancy at 14 weeks pregnant with a booking BP of 110/66. She was no longer on any anti-hypertensive medication. A 19-week anomaly scan indicated the presence of an anterior placenta with a posterior succenturiate lobe. This was not low lying. Active management of the third stage together with a prophylactic 40iu oxytocin infusion was recommended. The remainder of the pregnancy was uncomplicated.

Spontaneous labour ensued at 38⁺⁵ weeks gestation. This was followed by a vaginal delivery 2hrs following the spontaneous rupture of membranes, without the need of an oxytocin augmentation. The placenta was delivered and considered complete with the identification of the succenturiate lobe. Active management of the third stage, together with a prophylactic 40iu oxytocin infusion, was performed and a total estimated blood loss of 300mls was recorded. The patient was discharged on the third day following delivery. This was after breast-feeding was established. The patient was seen at 7 weeks and although she continued to breast-feed, her periods returned and were described as normal.

Second Line approach	Number of References identified	Number of cases in studies	Number of eligible cases	Original age at use of SLA (Yrs)	Original Gravity (G) and Parity(P)	Follow up duration (Months)	Duration of return to menses	Changes in menses since SLA	Number wishing to be/ became pregnant	Duration to next pregnancy / presentation	Total number of pregnancies	Terminations of pregnancy	Number of Miscarriages (1st trimester)	Number of Ectopics	Number of Preterm deliveries	Number of Term deliveries
<u>Hypogastric artery ligation</u>	11	98	63	16-40	G:1-8 P:0-6	Not specified	2 cycles to 52 days	"Light", "Normal", "Regular"	36	10 weeks - 7yrs	41	5	6	2	0	28
<u>Uterine artery ligation</u>	9	373	229	19-45	G:2-4 P:1-6	12-99	40-60 days	"Amenorrhoea", "Normal in rhythm duration and amount", "Unaltered"	59	1 month - 3.6yrs	56	2	0	1	1	52
<u>Embolisation</u>	25	672	493	18-50	G:1-10, P:0-8	4-152	4 weeks to 8 months	"Less abundant", "decreased flow", "Normal", "Irregular", "menopause", "Irregular", "Comparabile", "Prolonged", "Normal amount/flow"	154	2 months - 4yrs	161	15	18	2	8	118
<u>Uterine compression sutures</u>	19	153	64	19-43	G:1-4, P:0-3	6-36	5-17 weeks	"Comparabile", "Prolonged", "Normal amount/flow"	42	3 months - 3yrs	24	1	2	0	0	21
<u>Balloon Tamponade Technology*</u>	2	3	3	19-?	G2-?	NM	NM	NM	3	NM	3	0	0	0	0	3**

Table 1: SLA used in the management of PPH with and subsequent menses, fertility and pregnancies. NM:Not mentioned, *: Excluding this poster, **:Assumed term birth.

CASE 3:

Index pregnancy

A 28yr old multiparous woman in her 4th ongoing pregnancy presented at 37⁺² weeks with spontaneous rupture of membranes and draining clear liquor. She had experienced three previous vaginal deliveries and the last one was complicated by a PPH following the manual removal of the placenta.

She birthed her baby 24hrs later and she was administered 10iu oxytocin, IM. The placenta was noted to be adherent and a 40iu oxytocin infusion was commenced. Despite this and repeated intermittent attempts to remove the placenta by controlled cord traction, the placenta remained adherent. The woman was transferred to the operating theatre for manual removal of the placenta. Following this, bleeding ensued and despite the additional use of ergometrine (250mcg) and misoprostol (800ug), the uterus remained atonic. A decision was made to use a Bakri balloon.

A positive tamponade test was achieved at 450mls N-Saline. A final EBL of 1000mls was recorded. Three units of blood were transfused. The woman was discharged on day 3 following the birth of her baby with the view of attending her GP with respect to tubal ligation. She ceased breast-feeding at 7 weeks and experienced her first menses at 8 weeks and this was also described as normal.

Subsequent pregnancy

15 months later, she presented with a subsequent pregnancy at 10 weeks gestation. She did not manage to attain tubal sterilization. A similar management plan involving controlled cord traction and the use of prophylactic 40iu syntocinon infusion was recommended.

Her antenatal care was unremarkable, but she relocated to a different State and presented at 37 weeks in labour. Following the birth of her baby she again required a manual removal of the placenta in theatre. There was an estimated blood loss of 400mls. Despite this amount of bleeding, a Bakri balloon insufflated to 500mls was inserted following the manual removal "as a precautionary measure". This was removed within 24hrs.

She continued to breast-feed for only 6 weeks postpartum and then, experienced her 1st period at 8 weeks. Her USS at this time was described as unremarkable.

CASE 4:

Index pregnancy

A 25yr old nulliparous woman presented at 37⁺² weeks with spontaneous rupture of membranes and draining clear liquor in an otherwise uncomplicated pregnancy.

She birthed her baby 24hrs later and she was administered 10iu oxytocin, IM. The placenta was delivered and a PPH ensued, secondary to an atonic uterus. A 40iu oxytocin infusion was commenced. Despite the use of ergometrine (250mcg) and misoprostol (800ug), the uterus remained atonic. A decision was made to use a Bakri balloon.

The woman was transferred to the operating theatre and a Bakri balloon was inserted, 450mls was required to obtain a positive tamponade test. A final EBL of 2000mls was recorded. Three units of blood were transfused. The woman was discharged on day 3 following the birth of her baby. She planned to breast feed and use the Progesterone only pill as a method of contraception. She ceased breast-feeding at 5 months and experienced her first menses at this time. The periods were described as normal. An USS at this time was reported as normal.

Subsequent pregnancy

29 months later, she presented with a subsequent pregnancy at 13 weeks gestation. In addition to her routine antenatal care a similar management plan involving controlled cord traction and the use of prophylactic 40iu syntocinon was recommended, as with the other cases.

Antenatal care was unremarkable, and she presented in early labour at 40 weeks and 2 days. She progressed to full dilatation and following an ARM birthed her baby. The placenta was subsequently delivered following the administration of 10iu oxytocin IM. She experienced a second degree tear that required suturing and the final estimated blood loss was 400mls.



Figure 1: The steady increase in publications involving the Bakri balloon over the last 3.5yrs

Conclusion:

➤ The use of the Bakri balloon, as the sole second line approach in the management of postpartum haemorrhage, when first line uterotonics have failed, does not appear to be associated with any adverse effects on subsequent fertility, pregnancy and deliveries.

➤ More data with respect to subsequent pregnancies and menstrual function are necessary to establish the long-term safety of balloon tamponade technology in the management of PPH

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