Research Article

Intrauterine catheter to prevent hysterectomy in placenta previa and other morbid adherent placentas. A comparative study to other methods

Asma Zuhair Fadhil,[1] Edwar Z. Khosho[2]

[1] FICMS, Obstetrician and Gynecologist, Diwaniya Health Department, Iraq.
[2] FICMS Assistant Professor, Obstetrician and Gynecologist, Basrah Maternity Centre, Basrah, Iraq.

Iraqi New Medical Journal, 2014;1(1): P 22-25

Abstract

Background: Maternal and fetal morbidity and mortality from placenta praevia and placenta accreta are considerable and associated with high demands on health resources. With the rising incidence of caesarean sections combined with increasing maternal age, the number of cases of placenta praevia and its complications, including placenta accreta, will continue to increase, Women who have had a prior cesarean delivery and have a placenta previa or low anterior placenta in a subsequent pregnancy are at increased risk of abnormal placental attachment. The risk of placenta accreta, increta, or percreta reaches about 10 percent when placenta previa coexists with previous cesarean delivery, A suspected placenta accreta necessitates preparation for possible cesarean hysterectomy, including appropriate surgical expertise and availability of blood.

Objective: To evaluate the efficiency of intrauterine catheter for the saving uterus in cases of placenta previa.

Methods: A randomised clinical control study in which seventy four patients with placenta previa were included from February 2011 to April 2013 at Al-Hamza General Hospital and Maternal and Pediatrics Teaching Hospital in Al-Diwanyia City in Iraq. Patients are randomised to Cases Group when a Foley's catheter was used to control bleeding and control group when we used ordinary methods for controlling bleeding. Ordinary methods include the following procedures: Suturing uterine, tubo-overian, or internal iliac arteries, B-Lynch suture and/or Hysterectomy.

Results: Seventy four Patients with placenta previa were included in our study, 53 were in cases group while 21 were in control group. In cases group only 4/53 (7.55%) patients developed severe postpartum hemorrhage in comparison to 21/21 (100%) patients in control group P <0.001. Hystrectomy was needed to control bleeding in only two patients of cases group, while 18 patients (85.7%) in control group required hysterectomy during or after operation because of severe bleeding P <0.001.

Conclusion: Foley's catheter is a simple and effective way in controlling postpartum bleeding in patient with placenta previa.

Key words: Catheter, placenta previa, hysterectomy

INTRODUCTION

Placenta praevia is an obstetric complication in which the placenta is inserted partially or wholly in lower uterine segment.[1] It is much more common in early pregnancy than at term. it is one of the leading causes of antepartum haemorrhage (vaginal bleeding). It affects approximately 0.4-0.5% of all labours.[2] Increasing rate of cesarean sections (CS) worldwide has led to higher incidence of placenta praevia, accreta, percreta and severe postpartum hemorrhage (PPH) which are associated with significant morbidity and avoidable mortality.[3]

Tamponade, an old French word tampon, which means a plug inserted into an open wound or a body cavity to stop bleeding.[4] Uterine packing with roller gauze was the earliest form of uterine tamponade,[5] but was difficult to be applied and may not be effective in stopping bleeding. Foley's catheter, inflated with 60 ml[6] or 90 ml[7] normal saline, was also used with a success rate of up to 80%. However, the volume of its balloon was small for the immediate post-delivery uterine cavity.

Placenta accreta means that the placenta is firmly attached to the uterus. While placenta increta and percreta mean growth of placenta into the uterus and through it respectively. These conditions can sometimes be confirmed by ultrasound, CT scan, or MRI. Women with one of these conditions usually require a hysterectomy after delivery of the baby, because the

Corresponding Author: Asma zuhair Fadhil, Diwaniya Health Department. Diwaniya, Iraq. E Mail: **Habib_nag@yahoo.com**

placenta does not separate from the uterus.[8] Subtotal or total abdominal hysterectomy is usually the final option in the management of PPH. Hysterectomy is associated with numerous postoperative complications; including urinary tract injury, fistula formation, bowel injury, vascular injury, pelvic hematoma and sepsis. The loss of child-bearing potential and psychological consequences should also be considered.[9]

The successful use of the Foley's catheter balloon for internal uterine tamponade is also described.[10,11] The tip of gage 24 F Foley's catheter is guided into the uterine cavity and inflated with 60–80 ml of saline (anecdotally, a volume of 150 ml can be reached before it bursts). Additional Foley's catheters can be inserted, if necessary, until bleeding stops. As attractive, easy and cheap as this method is, some concerns have been raised regarding the use of the Foley's catheter for uterine tamponade. First, the capacity of the immediate postpartum uterine cavity, especially on term, is too large for effective tamponade to be achieved with one inflated balloon, and the risk of one balloon falling out of the uterus is high.[12] Second, significant bleeding may occur above the catheter bulb, as it may not fill the entire uterine cavity. Even the use of multiple Foley's catheters cannot ensure a complete compression effect on the entire uterine surface.

Uterine tamponade may also be used in combination with B-Lynch suture, at cesarean delivery; patients with persistent bleeding from uterine atony after the administration of uterotonics were treated with the placement of a B-Lynch suture. When B-Lynch suture failed, subsequent placement of an intrauterine Bakri balloon followed. This combination is termed the uterine sandwich.[13,14]

Since the first description of its use by Bakri et al in five cases of PPH due to placenta praevia,[15] few case series ranging from three to 15 cases have been published where this balloon was used to arrest bleeding from uterine atony as well as abnormal placentation. In one series of 15 cases the commonest cause of PPH was uterine atony. The rest of the cases were due to placenta praevia. They reported 80% success rate.[16]

Condoms latex or plastic sheaths are used mainly as contraceptive devices and barriers against STDs. A condom can be used to create the tamponade by inflating it with isotonic solution.[17]

Foley's catheter is inexpensive, requires simple experience or skills and widely available in the hospital wards, in order to evaluate its effecasy as intrauterine tamponade for saving uterus in cases of PPH due to placenta previa and other morbid placental adherence this study is conducted.

METHODS

It is a randomized controlled clinical study in which seventy-four patients with placenta previa were included at two major hospitals in Al-Diwaniya city in Iraq, Al- Hamza General Hospital and Maternal and Pediatrics Teaching Hospital, from February 2011 to April 2013. A standardized data sheets were prepared for collection of information including: name, age, body weight, vital signs, gravity, previous scar, grade of placenta previa according to ultrasound criteria.

Inclusion and exclusion Criteria: All pregnant women who were admitted to the above hospitals for delivery with a diagnosis of placenta praevia and/or morbid adherent placenta were included in this study. Pregnant women who were known to have a bleeding tendency for any cause, have chronic medical diseases, have bleeding in late pregnancy other than placenta praevia like abruptio placentae, cervical diseases (infection, growth or polyps), and women whom the decision of hysterectomy was made for reasons other than controlling bleeding i.e multiparous women who were not willing to become pregnant in the future were excluded from this study.

Randomization: Patients were randomized into two groups: Cases and control groups. The former group included patients treated with intrauterine catheters, while the latter included patients who underwent ordinary methods for controlling bleeding. Ordinary methods included the following procedures; 1) Suturing uterine, tubo-overian, or internal iliac arteries, 2) B-Lynch suture and/or 3) Hysterectomy. Patients in both groups have received the following 1) Resuscitative measures as needed like transfusion of blood and blood products, 2) Ten units of Syntocinon intravenously (I.V) as a bolus dose followed by infusion of 40 units in one liter of normal saline till 24 hours after the operation, 3) Intravenous antibiotic in the following regimen: ampicillin/Cloxacillin 500 mg I.V every 6 hours plus metronidazole 500 mg I.V every 8 hours plus gentamicin 80 mg every 8 hours for 7 days. In case of allergy to penicillin we used ceftriaxone 1g per day I.V plus metronidazole 500 mg I.V every 8 hours for 7 days.

Primary outcomes: During their in-hospital stay all patients were followed up to record either complete control of bleeding or need for hysterectomy.

Procedures: After suturing placental bed in women of cases group, a size 24 F or 30 F Foley's catheter (Hospital and Medical Device Co. Ltd. China) is introduced vaginally and inflated with 60 to 80 ml of normal saline then the uterus was sutured while the catheter is inflated inside it. We keep the inflated Foley's catheter for 24-48 hours.

Patients had been divided according to the grade of placenta previa into two groups depending on ultrasound features. Grade 1 when the placenta is in the lower segment of the uterus but does not reach internal os, grade 2 when the lower edge of placenta reaches internal os, but does not cover it, in grade 3 Placenta covers internal os partially, while Grade 4 placenta covers internal os completely. Grade 1 and 2 are grouped as minor placenta previa while grade 3 and 4 are major.

Statistical analysis: Data were analysed by SPSS version 11. T test has been used to test the significance of the difference in the results. The results were considered statistically significant if P value is < 0.05.

RESULTS

Table 1 shows demographic features of patients in each group. In **table 2** Patients had been divided according to the grade of placenta previa into two groups depending on ultrasound features. First one with placenta Previa grade I, II (minor no. = 9), while the second group with placenta Previa grade III, IV (major no.= 65) in which there were no significant differences between them in both cases and control groups. During operation most of patients (cases and control) had morbid adherent placenta.

In Cases Group where catheter was used, four cases developed severe postpartum hemorrhage, while most cases of the second group (control group) developed bleeding

during and after operation P <0.001. In patients treated with catheter only two cases needed hysterectomy during or after operation because of severe bleeding while in control group 18 patients ended with hysterectomy P <0.001 as shown in **table 3**.

Table 1. Demographic characteristics of cases and control group.

Parameter	Control (n = 21)			Cases (n = 53)			P Value	Significance
	Mean	SD	SE	Mean	SD	SE		
Age	24.52	4.91	1.07	22.70	5.13	0.70	0.167	Not
BMI	29.16	2.40	0.52	27.72	2.49	0.34	0.026	
Systolic BP	106.19	5.90	1.29	106.42	5.58	0.77	0.878	Not
Diastolic BP	72.62	5.39	1.18	73.85	5.39	0.74	0.379	Not
Gravida	4 (1-12)			4 (1-12)			0.847	Not
Para	1 (1-6)			2 (0-6)			0.634	Not
Abortion	0 (0-6)			0 (0-6)			0.371	Not
CS	1 (1-6)			2 (1-6)			0.385	Not
VD	0 (0-2)			0 (0-2)			0.491	Not

SE: Standard Deviation
SE: Standard Error
CS: Cesearian Section
VD: Vaginal Delivery

Table 2. Grades of placenta in both groups.

Parameter		Control		Cases		P value	Significance
		No.	%	No.	%		
Placenta Previa	Minor	3	14.29	6	11.32	0.707	Not
	Major	18	85.71	47	88.68		
Morbid adherent placenta	Acreta	7	33.33	15	28.30	0.838	Not
	Percreta	10	47.62	30	56.60		
	Increta	1	4.76	1	1.89		

Table 3. Outcome of all cases.

Parameter	Control (n=21)		Cases (n =53)		P Value	Significance
	No.	%	No.	%		
Bleeding	21	100.00	4	7.55	<0.001	Highly significant
Hysterectomy	18	85.71	2	3.77	<0.001	Highly significant

DISCUSSION

Hemorrhage continues to be an important contributor to maternal morbidity and mortality.[18] According to the Primary Report of Maternal Death study in Iraq for the years 2007-2009; obstetric hemorrhage is the first direct cause for maternal death in Iraq 36.3 %.[19]

The incidence of caesarean hysterectomy varies between developed world 0.3-1.6/1,000 deliveries per year and developing world 3.8/1000 deliveries.[20] It is predicted that the incidence will decline worldwide with the improvements in the obstetric care and the increasing availability of fertility preserving methods.

In our study the Foley's catheter was used during operation for placenta previa to create a ballooning function by inflation with a reasonable amount of fluid. By this way done a pressure similar to that of other balloons and stops bleeding.

Table 3 shows the outcome of all cases we found that in cases we used catheter four cases developed severe postpartum hemorrhage controlled by drugs and blood transfusion, while most cases of the second group (control group) developed bleeding during and after operation. Only one patient treated with catheter needed hysterectomy during operation and another one after operation because of severe bleeding, while in control group, 18 patients ended with hysterectomy. This is a clear evidence about the importance of this method in saving uterus and decreasing the need for hysterectomy. This finding is similar to a study done in Bangladesh, the method was first used in Dhaka Medical College Hospital to manage intractable PPH due to uterine atonicity or placenta accreta.[17]

Bakri et al. used balloon to arrest bleeding from uterine atony as well as abnormal placentation. They reported 80% success rate.[16] In our study all cases were placenta previa and Foley's catheter induced a success rate in almost all the patients.

The uterine sandwich was successful for all 5 patients undergoing this approach, the median volume infused into the balloon was 100 mL (range 60-250 mL). No complications were observed. This study shows that placing an intrauterine Bakri balloon in conjunction with the B-Lynch uterine compression suture was successful in treating uterine atony.[13,14] Our study showed also no significant complications.

Kim KJ and Cha SJ.[21] have used Supracervical cerclage with intracavitary balloon (SCCB) to control bleeding associated with placenta previa, their study has showed that the SCCB is a simple and effective technique to control bleeding associated

with placenta previa. While in our study we used intrauterine catheter with or without placental bed suturing to control the bleeding in order to prevent hysterectomy and it was very effective and safe in almost all patients.

In our study the result was similar to Bakri balloon, uterine sandwich, Condoms latex, and Kim KJ& Cha SJ with higher percentage of success with no bleeding postoperative and all patients have regular menstrual cycle during subsequent months. This may be due to time of using i.e. during operation or due to technique.

CONCLUSION

Urological catheter may be a simple, readily available and highly effective procedure to save patients with placenta previa a dreadful and inevitable decision of hystrectomy.

REFERENCES

1. Richard W, Sabaratnam A. Best practice in labour and delivery 1st ed Cambridge: Cambridge university Press 2009:142-146.
2. Faiz AS, Ananth CV. Etiology and risk factors for placenta previa: an overview and meta-analysis of observational studies. J Matern Fetal Neonatal Med 2003;13:175-190.
3. Confidential Enquiries into Maternal Deaths. Why mothers die: Triennial report 1997-1999. London: RCOG Press 2001
4. Collins English Dictionary, 5th ed. London: Collins, 2000:1563.
5. Drucker M, Wallach R. Uterine packing: A re-appraisal. Mt Sinai J Med 1979;46: 191-194.
6. Marcovici I, Scoccia B. Postpartum hemorrhage and intrauterine balloon tamponade. J Reprod Med 1999;44:122-126.
7. Khamaiseh K. The use of inflated Foley catheter balloon to arrest bleeding in PPH: 7 cases, presented in British Congress O&G 2007; Unpublished data.
8. De Loor JA, van Dam PA. Foley catheters for uncontrollable obstetric or gynaecologic hemorrhage. Obstet Gynecol 1996;88:737.
9. Marcovici I, Scoccia B. Postpartum hemorrhage and intrauterine balloon tamponade. A report of three cases. J Reprod Med 1999;44:122–6.
10. Akhter S, Begum MR, Kabir Z, Rashid M, Laila TR, Zabeen F. Use of a condom to control massive postpartum hemorrhage. Med Gen Med 2003;115:38.
11. Nivin Todd, Abnormalities of Pregnancy. The Merck Manual, 2005, Section 18 Chapter 252.
12. Baskett TF. sugical management of sever obstetric hemorrhage: experience with an obstetric hemorrhage equipment tray. J Obstet Gynaecol Can 2004;26:805-808.
13. Nelson W, O'Brien J. The uterine sandwich for persistent uterine atony: combining the B-lyncuh compression suture and an intrauterinbe Bakri Balloon. Am Journal Obstet Gynecol 2007;9-10.
14. Arduini M, Epicoco G, Clerici G, et al. B-lynch, intrauterine balloon and endouterine hemostatic suture for the management of post partum hemorrhage due to placenta previa accrete. Int J Gynaecol Obstet 2010;108(3):191-193.
15. Bakri YN, Amri A, Abdul Jabbar F, et al. Tamponade balloon for obstetrical bleeding. Int J Gynaecol Obstet 2001;74(2):139-142.
16. Vitthala S, Tsoumpou I, Anjum ZK, et al. Use of Bakri balloon in post partum haemorrhage: A series of 15 cases. J Obstet Gynecol 2009;49:191-194.
17. Akhter S, Begum MR, Kabir Z, Rashid M, Laila TR, Zabeen F. Use of a condom to control massive postpartum hemorrhage. Med Gen Med 2003;115:38
18. B. Clara.,Ph.D.Factors Associated With Peripartum Hysterectomy Author manuscript; available in PMC 2010.
19. Graham L, G., M-L Newell. Primary Report of Maternal Death study In Iraq for the Years 2007-2009:35.
20. Badejoko OO, Awowole IO, Ijarotimi AO, Badejoko BO, Loto OM, et al. Obstetric hysterectomy: trend and outcome in Ile-Ife, Nigeria. J Obstet Gynaecol 2013;33: 581-584.
21. Kim KJ, Cha SJ. Supracervical cerclage with intracavitary balloon to control bleeding associated with placenta previa. J Perinat Med 2011;39(4):477-81.