

## CASE SERIES

# Condom Tamponade in the Management of Primary Postpartum Haemorrhage: A Report of three cases in Ghana

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## Abstract

Postpartum haemorrhage is one of the major causes of maternal mortality worldwide. The leading cause of primary postpartum haemorrhage is uterine atony and active management of the third stage of labour with oxytocin is recommended for preventing primary postpartum haemorrhage. Parenteral oxytocin is also the drug of choice for medical management of postpartum haemorrhage secondary to uterine atony. Condom uterine balloon tamponade is a low cost technique that can be used as a second-line option for treatment. We report retrospectively three cases of primary PPH secondary to uterine atony which were managed successfully with condom tamponade. Condom tamponade is effective in managing post partum haemorrhage secondary to uterine atony and we advocate for the training of all skilled attendants on how to insert the condom tamponade. (*Afr J Reprod Health 2015; 19[3]: 151-157*).

**Keywords:** condom tamponade, postpartum haemorrhage, management

## Résumé

L'hémorragie du post-partum est une des principales causes de mortalité maternelle dans le monde entier. La principale cause de l'hémorragie du post-partum principale est l'atonie utérine et la gestion active de la troisième phase du travail à l'ocytocine est recommandée pour prévenir les hémorragies du postpartum primaire. L'ocytocine parentérale est également le médicament de choix pour la gestion médicale des hémorragies du post-partum secondaire à une atonie utérine. La tamponnade du ballon du préservatif utérin est une technique à faible coût qui peut être utilisée comme une option de deuxième ligne pour le traitement. Nous rapportons rétrospectivement trois cas de la HPP primaire, secondaire à une atonie utérine qui ont été gérés avec succès avec la tamponnade du préservatif. La tamponnade du préservatif est efficace dans la gestion de l'hémorragie du post-partum secondaire à une atonie utérine et nous proposons que tous les agents qualifiés soient formés sur la manière d'insérer la tamponnade du préservatif. (*Afr J Reprod Health 2015; 19[3]: 151-157*).

**Mots-clés:** tamponnade du préservatif, hémorragie du post-partum, gestion

## Introduction

Worldwide thousands of women continue to die from causes directly related to pregnancy and childbirth and millions of others suffer from pregnancy related injuries and complications. Overwhelming majority of these occur in developing countries. Sub-Saharan Africa alone accounts for nearly three fifths of all maternal deaths with cumulative lifetime risk of maternal death as high as 1 in 39 pregnancies as against 1 in 2900 in Europe<sup>1</sup>. Maternal deaths are related to a variety of health, social and economic factors but majority are directly caused by a limited number of complications such as hypertensive disorders, abortions, sepsis, obstructed labour and

postpartum haemorrhage (PPH) requiring access to emergency obstetric care.

Postpartum haemorrhage for instance affects approximately 4% of all pregnancies<sup>2</sup> and yet accounts for about a quarter of maternal deaths making it one of the major causes of maternal mortality worldwide<sup>3,4,5</sup>. In addition PPH is the highest cause of obstetric disease specific morbidity<sup>6</sup>. The leading cause of primary PPH is uterine atony<sup>7</sup>. Other causes include retained placenta, membranes, or blood clots; genital tract lacerations and coagulopathy<sup>8</sup>.

Active management of the third stage of labour with oxytocin is recommended for preventing primary postpartum haemorrhage<sup>9</sup>. Similarly in the event of primary postpartum

haemorrhage secondary to uterine atony, uterine massage followed by parenteral oxytocin is the first line of management. Uterine conservation methods employed after failure of medical treatment include balloon tamponade, uterine artery embolization, compression sutures and uterine or internal iliac artery ligation<sup>8,10</sup>. None of the aforementioned methods has been found to be superior to the other. Balloon tamponade however is the procedure that requires the least expertise to perform and is also without surgery. These attributes make balloon tamponade the favourite choice among the others<sup>8</sup> particularly in resource poor settings. Among the types of balloons used in this procedure are the Sengstaken—Blakemore tube<sup>11,12</sup>, the Rusch catheter<sup>13</sup>, the Bakri tamponade balloon catheter<sup>14,15</sup> and the male condom balloon tamponade<sup>16,17,18</sup>.

The male condom is primarily used as a contraceptive and in the prevention of sexually transmitted infections. However, in recent times it has found another use in condom tamponade for managing postpartum haemorrhage. Condoms are widely available in health facilities in Ghana and are relatively cheap. To date little is documented about the practices and successes of the use of condom tamponade in the management of postpartum haemorrhage in public health facilities in Ghana.

We report retrospectively three cases of failed medical treatment of primary postpartum haemorrhage secondary to uterine atony which were managed successfully with condom tamponade. The aim is to add to the existing knowledge of condom tamponade and also to advocate for the training of all skilled attendants on how to insert the condom tamponade.

## Methods

The cases were managed at the Obstetrics and Gynaecology department of the Ridge Regional Hospital in Accra, Ghana. The hospital which is located in the Osu Clotney Submetro of Accra was established in the

1920s as the European Hospital by the British to cater for the health needs of the expatriates. After Ghana gained independence the hospital was converted into a district hospital to serve the locality in which it is situated. In 1997 it was upgraded to the status of a regional hospital for the Greater Accra Region. The hospital serves as a referral Centre for the polyclinics, private clinics, and maternity homes in the Accra metropolis and beyond. In the year 2013, there were 7591 deliveries out of which 60% were referrals. Postpartum haemorrhage was the leading cause of maternal deaths accounting for 26% (9 out of 35) of maternal deaths.

A review of the case records of three cases that were managed at the hospital was undertaken. The cases were purposively selected to illustrate some of the different types of cases in which the condom tamponade can be used. It is routine to have informed consents obtained from patients before any procedures are undertaken in the hospital. Institutional permission was also obtained for the use of the data and for publication.

## *Description Of The Condom Tamponade Procedure*

### *Assembling of the condom catheter*

Under aseptic conditions a size 18 Foley's catheter is inserted into an unrolled male condom and the proximal end of the unrolled condom is tied with chromic catgut (any other suture can be used). The tie is to prevent escape of the saline solution when infused into the catheter. The tie should however not be too tight else the lumen of the catheter will be occluded and hinder the instillation of the saline.

### *Inserting the tamponade*

1. The cervix is exposed using Sims speculum (preferably two, one posterior and one

- anterior).
- Two sponge forceps (one anterior and one posterior) are used to pull the anterior and posterior lips of the cervix towards the introitus.
  - Another sponge forceps is used to introduce the prepared condom high up into the uterus holding the part of the catheter just distal to the tie. This is to prevent accidental puncture of the condom.
  - The two sponge forceps are now used to approximate the anterior and posterior lips of the cervix; one on either side of the catheter and very close to it. This narrows the cervical os and prevents prolapse of the filled condom into the vagina. At this point we replaced the sponge forceps with sutures while the introducer sponge forceps is still holding the condom high up in the uterus.
  - The condom is now filled with normal saline under gravity until the bleeding stops. The introducer sponge forceps is removed when the filling of the condom starts.
  - The distal end of the Foley's catheter is occluded with a small artery forceps or spigot with a 2cc syringe

### **Removal of tamponade**

The artery forceps or spigot is removed and the saline is drained gradually (initial 20ml in 5 minutes) whilst observing for any bleeding. If there is no bleeding, the rate of deflation is increased to a total time of about 30 minutes. After draining of the saline, the condom is removed followed by the forceps or sutures placed to narrow the cervical os.

### **Case Reports**

**Case 1:** This was a 28 year old nullipara who was admitted as a case of severe preeclampsia in March 2011. She has been referred from a private maternity home. She was 40 weeks pregnant. Her last haemoglobin (Hb) a month prior to presentation was 10.8g/dl.

On arrival she looked ill and was moderately pale. She was anicteric and had bilateral pitting pedal edema up to the knee. The pulse was 94 beats per minute (beats/min) and the blood

### **Condom Tamponade for Postpartum Haemorrhage**

pressure (BP) was 180/115mmHg. The respiratory rate was 18 cycles per minute (cycles/min) and the chest was clinically clear. The symphysis-fundal height was 39cm. The uterus was tense and tender and the fetal parts were difficult to palpate. The fetal heart was absent and this was confirmed by ultrasound scan. The cervix was about 2cm long, not effaced and closed. There was no vaginal bleeding. A provisional diagnosis of Severe Preeclampsia with Concealed abruptio placenta was made.

Blood samples were taken for full blood count, blood urea and electrolytes, grouping and cross matching and bed side clotting time and urine for urinalysis.

She was managed on intravenous (IV) hydralazine for blood pressure control, magnesium sulphate for seizure prophylaxis and prepared for emergency caesarean section which was done under spinal anaesthesia. The bed side clotting time before surgery was 10minutes and the Hb was 9.0g/dl.

The findings at surgery were a female fresh still born weighing 3.7kg, abruptio placentae with about 1000ml of retro placental clots and a Couvalaire uterus. Ten units of oxytocin were given intravenously after delivery of the fetus and oxytocin infusion (30 units in 500ml normal saline) was set up to run at approximately 30 drops per minute (drops/min). Soon after the surgery she was noticed to be bleeding heavily per vaginum. The blood was not clotting and the uterus was flabby. She lost about 500ml of blood within 5 minutes and her BP which hitherto was between 140/90mmHg and 160/105mmHg dropped to 90/60mmHg. Uterine massage was started and 600µg of misoprostol was inserted rectally but the bleeding continued. Her bed side clotting time was now more than 15 minutes.

A condom tamponade was inserted and filled with about 400ml of normal saline which stopped the bleeding. The total estimated blood loss was 800ml. The oxytocin infusion was continued for the next 12 hours. She was transfused two units of whole blood and four units of fresh frozen plasma. She was covered with broad spectrum antibiotics for five days. The condom tamponade was removed after 24 hours. She remained in intensive care for the next 72 hours (because of her general condition and not

specifically as a result of the PPH) after which she was transferred to the general ward. She was discharged home on post-operative day 7 with an Hb of 7.8 g/dl. She was given oral haematinics.

**Case 2:** This was a 25 year old nullipara who had assisted vaginal breech delivery with the aid of an episiotomy in September 2012. She was admitted in advance labour. The antenatal period had been uneventful and the pregnancy was at 39 weeks. Her Hb checked two weeks prior to presentation was 10.5g/dl.

The baby was a live healthy 2.9kg male. The third stage was managed actively and the placenta and membranes were complete. The episiotomy was repaired and there were no vaginal or cervical lacerations. The estimated blood loss was 200ml. The uterus was about 22 weeks size and well contracted.

About 30 minutes after delivery, she was noticed to be bleeding per vaginum. Examination revealed a mildly pale lady with a pulse of 96 beats/min and BP of 90/60mmHg. The uterus was 24 weeks size and flabby. The cervix was 5cm dilated and about 400ml of blood and clots were expelled from the uterus and vagina. She was resuscitated with normal saline and blood was taken for Hb and grouping and cross matching. A urethral catheter was passed and retained. Uterine massage was started and intramuscular oxytocin 10 units and oxytocin infusion (30 units in 500ml normal saline) at a rate of about 30 drops/min were given. She continued to bleed on and off and after 10 minutes intravenous ergometrine 0.5mg was given but the bleed continued.

A condom tamponade was passed and filled with about 300ml of normal saline after which the bleeding stopped. The oxytocin infusion was continued for the next 8 hours. The Hb checked was 8.9g/dl. She was not transfused any blood. She was covered with broad spectrum antibiotics for five days. The tamponade was removed after 18 hours. She was discharged home on the second day after delivery on oral haematinics.

**Case 3:** This was a 32 year old with four previous deliveries, one of which was a caesarean section. Following an uneventful antenatal period, she was admitted in labour at 38 weeks in May 2013. Her general condition was satisfactory and she was not pale. The cervix was 6cm dilated on

admission. She remained 6cm for the next 6 hours and therefore the decision was therefore for her to have caesarean section. Her Hb was 11.0g/dl.

She however became fully dilated while waiting in theatre for the caesarean section and delivered a healthy female with birth weight of 3.4kg. The third stage was managed actively and lasted 10 minutes. The placenta and membranes were complete. Soon after the third stage she started bleeding profusely per vaginum. The pulse was 110 beats/min and weak with a BP of 85/50 mmHg. The uterus was 22wk size and flabby. There was no evidence of free fluid in the abdomen. Estimated blood loss was 1000ml. A diagnosis of Primary postpartum haemorrhage secondary to uterine atony with a differential of Scar dehiscence was made.

A second IV line with a wide bore cannula was secured and resuscitation with crystalloids was started. She was initially managed with uterine massage, intramuscular oxytocin 10 units, oxytocin infusion (30 units in 500ml normal saline) at a rate of about 30 drops/min. Examination of the cervix and vagina did not reveal any laceration. The bleeding stopped briefly only to restart after about 15 minutes. The additional blood loss was estimated to be 300ml. Intravenous ergometrine 0.5mg was given but this could not stop the bleeding.

A condom tamponade was passed and filled with about 400ml of normal saline after which the bleeding stopped. The oxytocin infusion was continued for the next 8 hours. She was transfused two units of whole blood. She was covered with broad spectrum antibiotics for five days. The tamponade was removed after 24hr. She was discharged home well on post-delivery day three with Hb of 8.5g/dl. She was given oral haematinics.

## Discussion

Postpartum hemorrhage is an obstetric emergency and a leading cause of maternal mortality. The recommendation is a step-wise approach to management of post-partum haemorrhage from less invasive therapies like uterine massage and uterotonic drugs to more invasive ones like arterial embolization, uterine compression sutures, uterine

artery ligation and ultimately hysterectomy. Intrauterine balloon tamponade is an effective intermediate therapy option that can be implemented by frontline health workers with minimal training. It is a life-saving intervention, especially in settings where blood transfusion and surgical facilities may not be readily available. Condom tamponade for instance is an effective method for controlling intractable postpartum haemorrhage. It is very simple and does not require much expertise to use. Hence it can have a wide application even in very resource poor settings.

To unleash the innovative potential of cheap and affordable strategies to help overcome some of the challenges militating against the reduction in maternal mortality, we have reviewed three cases of PPH managed successfully with condom tamponade in a health facility in Ghana where condoms are available and primarily used as contraceptives. In addition, items like Foley's catheter, intravenous infusion sets and chromic catgut are common in every labour ward in Ghana. Hence if the expertise is made available, condom tamponade can be passed in virtually every labour ward in the country. In this report we seek to demonstrate the utility of condom tamponade and had presented three different cases of postpartum haemorrhage which were unsuccessfully managed with medical therapy and had to be augmented with the condom tamponade. In all cases condom tamponade was easily passed and removed around 24 hours and patient discharged home within two to seven days.

The presumed mechanism of action of the tamponade in stopping the bleeding is by creating an intrauterine pressure which exerts hydrostatic pressure on the capillaries and veins in the uterus. The pressure does not necessarily have to be higher than the systemic arterial pressure<sup>10,19</sup>. In addition, hydrostatic pressure effect of the balloon on the uterine arteries has been proposed<sup>20</sup> and stimulation of uterine contractions by the balloon in the cervix has also been demonstrated<sup>21</sup>.

Because the condom tamponade is meant for uterine atony, trauma as a cause of the PPH must be ruled out through thorough visual examination of the genital tract. That tamponade can be used to

control bleeding even in the face of coagulopathy as in Case 1 has been reported by others<sup>17</sup>. Case 1 had come in with severe abruption with confirmed fetal death. She was at risk of coagulopathy and would have been an ideal candidate for vaginal delivery. However, considering the fact that the cervix was even not effaced we anticipated a long labour which was going to prolong the duration of the coagulopathy. In addition, getting sufficient blood and blood products in the face of severe coagulopathy in our settings can be a nightmare. We therefore considered caesarean section as the better option.

One major challenge in applying the condom tamponade however is keeping the inflated condom in place when the cervix is dilated. Naturally the fluid filled condom will fit the least resistance space and with a dilated cervix soon after delivery, this will be in the vagina<sup>10</sup> and hence defeat its purpose. Among the methods used to keep the inflated condom in place are: inflating the vagina with another condom, holding the cervix with sponge forceps, use of vaginal packs and using stitches to narrow the size of the cervical os<sup>16,17,18,22,23</sup>. We found placing stitches on either side of the catheter to narrow the cervical os very useful. This ensures that the fluid filled condom remains in the uterine cavity. Again unlike the other methods which may give the patient some discomfort considering the long time the condom is left in place, the stitches are virtually without discomfort. Putting in the sutures however takes additional time and care must also be taken not to puncture the condom. In inexperienced hands, we suggest the use of sponge holders and vaginal packs.

Condoms do not allow for drainage of the uterine cavity. Even though some blood can flow over the surface of the condom into the vagina<sup>17</sup>, it is also possible for the blood to accumulate above the condom. There is therefore the need for close monitoring of the patient's vital signs and the fundal height of the uterus to identify failure early and proceed with further treatment.

Despite carrying out the procedure under aseptic conditions, we covered our patients with antibiotics as we could not guarantee complete asepsis following vaginal delivery with possible

contamination of the field with faecal matter. We also took into consideration the risk of puerperal sepsis following PPH<sup>24</sup>.

The rate of deflating the condom after bleeding has stopped is practitioner depended. Rates ranging from 10-15 minutes for 250 to 500ml of fluid<sup>23</sup>, 20ml/hr<sup>25</sup> to 125ml/hr<sup>26</sup> without rebound bleeding have all been reported. We deflated the first 20ml in 5 minutes and the rest in 25 minutes without rebound bleeding.

In case of failure of medical treatment in facilities without functioning theatres or doctors with the expertise to perform laparotomy and surgically manage the patients or both, the patients have to be referred. Time is of essence in the management of PPH. Most PPHs occur without any risk factor<sup>7</sup> and in the absence of effective medical intervention patients with PPH on the average die within 2 hours<sup>27</sup>. It is therefore imperative for every skilled birth attendant to be able to proceed to a second line of treatment such as putting in a condom tamponade when medical treatment fails. Even for the cases that need referral, putting in the condom tamponade can help reduce the amount of bleeding while the patient is in transit.

While midwives and nurses attend to 54% of deliveries in Ghana, doctors account for 13% with the remaining been attended to by traditional birth attendants, friends and relatives. The caesarean section rate in Ghana is 11%<sup>28</sup> and since only doctors perform caesarean sections in Ghana<sup>29</sup> their contribution towards vaginal deliveries may just be about 2%. When postpartum haemorrhage occurs during caesarean section, surgical management is immediately available when medical treatment fails, assuming the surgeon has the expertise to manage. However, in the event of failure of medical management after vaginal delivery there will be some time lapse before surgical management can be instituted. This gap will have to be filled by a second line treatment and condom tamponade is ideal.

Currently majority of midwives and nurses with midwifery skills in Ghana can only manage uterine atony medically. With their role as the core cadres for vaginal deliveries, the fight against morbidity and mortality from PPH will be difficult to achieve if all they can do is medical

management. This is why we seriously advocate for midwives and nurses with midwifery skills to be trained in how to apply the condom tamponade. Though the cases presented were handled by medical doctors with the assistance of midwives, our observation is that nurses and midwives can easily be taught the procedure. This has been demonstrated in other African countries<sup>30</sup> especially if they are to use sponge holders or vaginal packs to keep the inflated condom in place.

Our report is limited by the small number of cases. However, it is significant to note that this low technology procedure was able to manage all the cases.

## Conclusion

Condom tamponade has been found to be effective in managing post-partum haemorrhage secondary to uterine atony. In low resource settings, making use of condom tamponade can help stem the tide of maternal mortality secondary to PPH. We suggest that the Ghana Health Service put a premium on condom tamponade and train all maternity service providers in its application at least on a pilot basis prior to full implementation.

## Contribution of Authors

Ernest T Maya - Conceived the idea to write paper and was involved in preparation of the manuscript  
Kennedy A Buntugu – Was involved in preparation of the manuscript  
Lovelace Ako – Retrieved the case notes, summarized them and was involved in preparation of the manuscript  
Emmanuel K Srofenyoh - Was involved in preparation of the manuscript All the authors mentioned above approved the manuscript

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