Original Research Paper

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Role of Intrauterine Packing in Primary Post Partum Haemorrhage

Medical Science

KEYWORDS : -Intrateine packing,Postpartum haemorrhage,Primary postpartum haemorrhage

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ABSTRACT

Title-Role of intrauterine packing in primary postpartum hemorrhage

Aims and Objective-

1. *To Study various causes of primary PPH.*
2. *To Study management of primary PPH in cases of :*

(A) Vaginal Delivery

(B) Caesarean Section

3. *To Study efficacy of utero vaginal packing in controlling primary atonic PPH.*
4. *Outcome of uterine packing in atonic PPH.*
5. *Maternal morbidity following uterine packing in atonic PPH.*

Material and Methods-This is study of 100 cases of Primary PPH in vaginal delivery and caesarean section. Intrauterine packing was done with a variable length of sterile ribbon gauze. Vaginal route was used for woman who developed PPH after vaginal delivery. Firm packing was done in layering ribbon gauze from fundus to cervix. In case of caesarean section incision was closed, tip of ribbon gauze was observed for soakage.This study was conducted in Umaid Hospital, Department of Obst and Gynae, Jodhpur.

METHOD-Intrauterine packing was done by using 8-10 meter gauze starting from the fundus with the help of sponge holding forceps up to the cervix.After securing bilateral uterine incision angles, uterus was packed with folded sterile gauze about 2m long and 10cm wide gauze in layers through the caesarean incision from one cornua to the other with a sponge holding forceps or with the help of the index and middle finger, from the fundus into the lower uterine segment with its end passing through the cervix into the vagina.Incision in lower segment was sutured continuously in two layers taking care not to include inadvertently the gauze into the sutures. Prophylactic broad-spectrum intravenous antibiotics coverage was used in all cases. Patients vital signs were taken every hour and vaginal bleeding was assessed. After giving mild sedative drugs, uterine packing was removed after 24-48 hours of insertion. According to the amount of blood loss and preoperative hemoglobin level blood transfusion was given. Postoperative complications were noted and patients were followed for upto six weeks in the outpatient clinic.

Results- Among 100 patients ,50 patients were in the age group of 21 -25 year and only 8 patients were above age of 30 years.68 patients were from rural area and 81 % cases were from low socioeconomic status Uterine atony unresponsive to oxytocics was the commonest cause of postpartum hemorrhage, seen in 76 patients followed by placenta previa in 12 patients. 8 out of 9 required transfusion, in only 1 case, hemorrhage continued and a hysterectomy was done. Pack was removed earliest at 12 hours and maximum at 24 hours in successful cases in present study.77 patients had caesarean section and 23 patients had vaginal delivery as far as mode of delivery is concerned.

Conclusion- Utero vaginal packing is effective in arresting the bleeding due to Primary PPH. In our setup, with limited and overburdened resources, utero vaginal packing still retains an important role in emergency obstetrics.. Patient at primary and secondary health care set up can be managed easily by intrauterine packing, it buys them time while transporting them to tertiary hospital.It is A Ray of Hope for such under privileged patients.Every obstetrician should be familiar with the technique of packing as this may save life, avoid laparotomy and conserve uterus.

INTRODUCTION

According to World Health Organization (WHO), post partum haemorrhage (PPH) is the commonest cause of maternal mortality and accounts for one quarter of all maternal deaths worldwide. In a systemic review by Khan KS et al (2006), it was reported that in developing countries, PPH accounts for over one-third of all maternal deaths. In similar report by Department of Reproductive Health and Research, WHO (2000), it was found that 14 million cases of PPH occur every year with a case fatality rate of 1%.1

The famous monument Tajmahal was built by mughal emperor Shah Jahan in the memory of his wife Mumtaz who died of PPH during her 14th child birth in early part of the 17th century. In a recent confidential enquiry into maternal and child death as "Saving mother's lives (2003-2005)",2 the phenomenon of "too little, too late" was highlighted. Although postpartum haemorrhage (PPH) has declined in frequency as a cause of maternal death, it remains a significant cause of maternal morbidity and mortality.

Post partum hemorrhagic complications (including rupture uterus) account for 10.5% of non abortive maternal deaths in the United States. In developing countries, maternal death rate from haemorrhage is even higher. Because PPH is one of the more common and, easily treated complications of delivery, the obstetrician may not underestimate the volume and impact of PPH until a catastrophic situation develops. PPH is best managed by a high level of awareness of the causes of haemorrhage and a systematic approach to management when this problem develops.

There is no single satisfactory definition of PPH. An estimated blood loss in excess of 500 ml following a vaginal delivery or a loss greater than 1000 ml following caesarean section often has been used for diagnosis of PPH.3 The Scottish Confidential Audit of severe maternal morbidity by Penny G et al 2005 defines PPH as major haemorrhage where an estimated blood loss of >2500 ml or the transfusion of 5 or more units of blood or therapy for coagulopathy. The quantity of blood loss is less important than the effect it has on the healthywoman which depends on her blood volume and any underlying health factors. For this reason, it has been suggested by Doumouchtsis et al

(2008)4 that any amount of blood loss which causes major physiological changes (e.g. a fall in blood pressure or increase in pulse rate) should be included in the definition of PPH. The risk of dying from PPH depends not only on the amount and rate of blood loss but also on the health of the woman. The most common consequences of PPH include hypovolemic shock, disseminated intravascular coagulopathies (DIC), renal failure, hepatic failure and acute respiratory distress syndrome (ARDS)5. As every woman is potentially at risk of postpartum haemorrhage, Active management of labour should be offered to manage this life threatening condition promptly and effectively.

PPH is of 2 types6:-

1. Primary PPH occurs within 24 hours of delivery of the baby.
2. Secondary PPH occurs after 24 hours but within 6-12 weeks postpartum.

ETIOLOGY AND PRECIPITATING FACTORS6

Causes of primary postpartum HAEMORRHAGE In recent years, individual authors and academic groups have used the four Tspnemonic to provide a simplistic categorization of the causes of PPH.

Uterine atony

Uterine atony, the most common cause of PPH. It can occur after normal vaginal delivery, instrumental vaginal delivery and abdominal delivery.

Trauma

Trauma is reported as the primary cause of PPH. Genital tract trauma at delivery to the broad ligament, uterine rupture, cervical and vaginal tears and perineal tears are all associated with increased blood loss at normal vaginal delivery.

Tissue

Retained placenta accounts for approximately 10% ofall cases of PPH. Effective uterine contraction to aidhemostasis requires complete expulsion of the placenta. Most retained placentas can be removed manually, but rarely the conditions of placenta percreta, increta and accreta may be responsible for placental retention.

Thrombin

Disorders of the clotting cascade and platelet dysfunction are the cause of PPH in 1% of cases . Known associations with coagulation failure include placental abruption, pre-eclampsia, septicemia and intrauterine sepsis, retained dead fetus, amniotic fluid embolus, incompatible blood transfusion, abortion with hypertonic saline and existing coagulation abnormalities.

RISK FACTORS FOR PRIMARY POSTPARTUM HAEMORRHAGE

- Age
- Ethnicity
- Body mass index
- Parity

Other medical conditions

Several medical conditions are also associated with PPH. Women with type 2 diabetes mellitus have an increased incidence of PPH, its(34%) compared to the non diabetic population. Epilepsy is also associated with PPH.

Connective tissue disorders such as Marfans and Ehlers-Danlos syndrome have also been associated with PPH. Blood loss at delivery is also increased with inherited coagulopathies. The most common inherited hemorrhagic disorder is von Willibrand's disease, with a reported prevalence of between 1% and 3%. Most patients (70%) have type 1 disease characterized by low plasma levelsof factor VIII, von Willibrand factor antigen and von Willibrand factor activity. Less common inherited bleeding disorders include carriage of hemophilia A(factor VIII deficiency) or hemophilia B (factor IXdeficiency) and factor XI deficiency. In their review, Economaides and colleagues suggest that the risks of primary PPH in patients with von Willibrand's disease, factor XI deficiency and carriers of hemophilia are 22%, 16%, and 18.5%, respectively, compared with 5% in the general obstetric population. James also reviewed the numerous case series and the case–control studies of women with bleeding disorders, Prolonged pregnancy, Fetal macrosomia, Multiple pregnancies, Fibroids, Antepartum haemorrhage, Previous history of PPH, Magann and colleagues found previous PPH to be associated with an increased risk for subsequent PPH and Previous caesarean delivery.

INTRAPARTUM RISK FACTORS FOR PRIMARY POSTPARTUM HAEMORRHAGE

- Induction of labor
- Duration of labor
- First stage
- Second stage
- Third stage
- Analgesics
- Delivery method

Placental causes and uterine atony are the most common forms of postpartum haemorrhage, it is worthwhile recalling the following facts. Postpartum haemorrhage due to other than trauma arises from the placental bed which is obviously inside the uterus. The blood supply comes from outside the uterus and traverses the myometrium. Primary haemostasis from the placental bed is due to compression of the uterine vessels as they pass through the myometrium. The degree of compression of these vessels depends on the force acting on the vessels. This force obeys the Young-Laplace relationship ($F= 2T / r$), where F equals the compressive force acting on the blood vessels, T is the wall tension (generated by the uterine contraction), and r is the radius of the uterus. It is apparent that the force compressing the vessels cannot be very high if r is large. Therefore, it is essential that the radius of the uterus be made small by emptying the uterus from any blood or placental tissue and increasing the wall tension of the uterus (T) by giving ecbolics. This is the scientific basis of the initial treatment and the prevention of primary postpartum haemorrhage.7

To prevent and manage PPH, there have been implementations of various invasive and non-invasive methods. Medical management of PPH usually involves the use of various uterotonics, such as oxytocin, Methylergometrine,15-methyl prostaglandin F2α, dinoprostone, and misoprostol .Ifuterotonics fail, techniques of tamponade include uterine gauze packing or the use of a Folley's intrauterine catheter, Sengstaken–Blakemore tube8, and Bakri balloon are used. Management of intractable primary PPH, refractory to oxytocics and prostaglandins requires prompt action. Intra uterine packing is a non-invasive, safe, quick and cost-effective method applied for prevention and management of PPH.

Uterine packing works as a pelvic mass created by thepacking that elevates the uterus up and out of the pelvis placing the uterine arteries on stretch and decreasing their perfusion pressure. The right packing exerts direct pressure on at least some branches of the uterine arteries, decreasing blood flow to the uterus. By preventing the escape of uter-

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ine blood loss out of the vagina, the packing contributes to a back-up pressure that helps to control uterine bleeding. Uterine packing may be a reasonable alternative to further surgical intervention in patients with intractable obstetrical haemorrhage.

Conservative and Surgical management of controlling PPH be enlisted as:

CONSERVATIVE MANAGEMENT[6]

Bimanual Compression: Bimanual compression of the uterus prevents an increase in the radius of the uterus due to atony. Simultaneously, the uterus is pushed cephalad, which puts the uterine arteries under tension and reduces blood flow to the uterus.

Oxytocin : Stimulation of uterine contraction is usually achieved in the first instance by bimanual uterine massage and the injection of oxytocin (either intramuscularly or intravenously), with or without ergometrine. The mode of action of oxytocin involves stimulation of the upper uterine segment to contract in a rhythmical fashion. Owing to its short plasma half-life (mean 3 min), a continuous intravenous infusion is required in order to maintain the uterus in a contracted state. The usual dose is 40 IU in 500 ml of saline, with the dosage rate adjusted according to response (typical infusion rate 10 IU/h or 2 ml/min). When administered intravenously, the onset of action is almost instantaneous and plateau concentration is achieved after 30 minutes. By contrast, intramuscular administration results in a slower onset of action (3–7 min) but a longer lasting clinical effect (up to 60 min).

Methergin: Methyl ergometrine is a smooth muscle constrictor that mostly acts on the uterus. It is most commonly used to prevent or control excessive bleeding following childbirth and spontaneous or elective abortion, and also to aid in expulsion of retained products of conception.

Carboprost: Carboprost (15-methyl PGF2α) acts as a smooth muscle stimulant and is a recognized second-line agent for use in the management of postpartum uterine atony unresponsive to oxytocin or ergometrine. It is an analogue of PGF2α (dinoprost) with a longer duration of action than its parent compound, which is attributed to its resistance to inactivation by oxidation at the 15-position. Available in single-dose vials of 0.25 mg, it may be administered by deep intramuscular injection or, alternatively, by direct intra myometrial injection. The latter route of administration is achieved either under direct vision at caesarean section or trans abdominally or transvaginally following vaginal delivery and has the advantage of a significantly quicker onset of action. Peripheral intramuscular injection yields peak plasma concentrations at 15 min in contrast to less than 5 min for the intra myometrial route.

Misoprostol : Misoprostol is a synthetic analogue of prostaglandin E1 which selectively binds to myometrial EP-2/ EP-3prostanoid receptors, thereby promoting uterine contractility.

SURGICAL MANAGEMENT :

Bilateral mass ligation of the uterine arteries: This has been used in cases of bleeding during Caesarean sections. Sutures including 2-3 cm of myometrium are placed 2-3 cm below the uterine incision.

Uterine Devascularisation: This consists of (1) unilateral and, if required (2) bilateral uterine vessel ligation, followed by (3) low bilateral uterine vessel ligation after mobilisation of the bladder, and (4) unilateral or bilateral ovarian vessel ligation (28) Both techniques allow revascularisation of the ligated vessels with subsequent normal uterine function.

B-Lynch described uterine atony. The suture aims to exert continuous vertical compression on the vascular system. In the case of post partum haemorrhage from placenta previa, a transverse lower segment compression suture is effective.

Uterine Tamponade: Balloon technology has been used to tamponade the postpartum uterus to control haemorrhage. This involves inserting a rubber or silicone balloon into the uterine cavity and inflating the balloon with normal saline. The intrauterine balloon is believed to act by exerting in inward-to-outward pressure 'that is greater than the systemic arterial pressure' to prevent continous bleeding.

More recently, an alternative mechanism of action has been proposed, which involves the hydrostatic pressure effect of the balloon on the uterine arteries.

AIMS AND OBJECTIVES

1. To Study various causes of primary PPH.
2. To Study management of primary PPH in cases of :
3. Vaginal Delivery
4. Caesarean Section
5. To Study efficacy of utero vaginal packing icotrolingprimary atonic PPH.
6. Outcome of uterine packing in atonic PPH.
7. Maternal morbidity following uterine packing in aton ic PPH.

REVIEW OF LITERATURE

Uterine packing should be considered in women with refractory postpartum hemorrhage related to uterine atony. It became Popular during the first half of the 20th century, uterine packing subsequently fell out of favour because of concern about concealed bleeding and infection(Hsu and co-worker,2003)9.Newer techniques, however have allayed some of these concerns, In one technique ,the tip of a no.24F Foley catheter with a 30-ml balloon is guided into the uterine cavity and filled with 60 to 80 ml of saline. The open tip permits continuous drainage from the uterus. If bleeding subsides, the catheter is typically removed after 12 to 24 hours (Roman and Rebarber, 2003)10. Ligation of the internal arteries at times reduces the hemorrhage appreciably (Allahbadia,1993; Clark and colleagues, 1985). However, the procedure may be technically difficult and is successful in less than half of the patients in whom it is attempted (American College of Obstetricians and Gynecologists,1998)11.

In 1997, B-Lynch and colleagues12 described a surgical technique performed in five woman with severe postpartum hemorrhage in which a pair of vertical brace #2 chromic sutures were secured around the uterus, giving the appearance of suspenders, to compass together the anterior or posterior walls. A simpler modification of technique has been described by Hayman and associates (2002)13. We have found this suture to be effective in some cases however, published experience with these techniques remains limited.

In the developing world risk of maternal death from post partum hemorrhage is 1 in 1000 deliveries. In UK the risk is 1 in 100000. Management of intractable post partum hemorrhage, refractory to oxytocics and prostaglandins requires prompt action. Most common cause of is atony of the uterus14.

Primary PPH is among the top 5 causes of maternal mortality in both developed and developing countries15. In review of more than 2000 maternal deaths in United States, Kaunitz and colleagues16 reported that 13% were due to hemorrhage, one third of which were attributed to PPH.

Richard Johanson21 described an innovative method of tamponade using hydrostatic balloon catheter to prevent PPH.

Hsu S. et al9 suggest that uterine packing may be areasonable alternative to further surgical intervention in patients with intractable obstetrical haemorrhage.

Gulfishan Haq et al22 have reported a success rate of 85% in their series of 20 patients, which included 4 cases with haemorrhage after second trimester miscarriage.

Robert C. Maier20 in his retrospective review of 9 cases of primary PPH showed a success rate of 77.78%.

Yet another study by Senzan Hsu et al9 reported success in 8 (88.89%) of 9 cases. 2 cases had haemorrhage after dilatation and evacuation and one of them failed to respond to packing.

Sherry Boschert24 in her "small 18 study" reported success rate of 66.66% after uterine packing.

Study conducted by Ali et al23 showed 86% success rate, while another study conducted by ShujaS25 showed 82.1% success rate.

A study conducted by Robert et al20 showed that successful treatment of haemorrhage was clinically evident after procedure was completed, although packing material became heavily stained with serosanguinous fluid. Fever after uterine packing was minimal and of no clinical significance.

In a study from Dow University Pakistan on uterine packing showed successful management and it was recommended that packing should be practiced even at tertiary hospitals as primary tool for managing PPH.

Ashley S Roman in his article of "seven ways to control postpartum haemorrhage" describes "re-emergence" of uterine packing, which fell out of use largely due to concerns of concealed haemorrhage10. He also mentioned that several modifications have allayed these concerns. Interval for removal of pack has to be individualized according to clinical findings.

Uterine atony is identified as the main cause of PPH accounting for about 90% in most reports (Bateman et al., 2010; Carroli et al., 2008; Combs et al., 1991; Doran et al, 1955)26-27.

In developing countries like Malaysia, uterine atony contributed 37.5% to 67.7% of PPH associated mortality between 1994-2005 (Division of Family Health Development, Ministry of Health, 1994; Division of Family Health Development, Ministry of Health, 1996; Division of Family Health Development, Ministry of Health, 2000; Division of Family Health Development, Ministry of Health, 2005). Massive PPH is defined as blood loss of 1000ml or more (Carroli et al., 2008)28. Uterine massage performed immediately after administration of oxytocin did not show significant additional benefit as compared to oxytocin alone (Abdel-Aleem et al., 2010).

External aortic compression devices have been described by several authors (Winter, 1939; Soltan et al., 2009)29. These have been shown to be effective in reducing the resuscitation time and also the amount of blood being transfused with minimal side-effects reported. However, these devices are not readily available.

Bimanual compression is performed by inserting the right hand into vagina at anterior surface of the uterus and the left hand is on abdomen at the fundus towards the posterior surface of uterus. The uterus is compressed between the two hands to minimise bleeding. This technique can be used as a temporary measure while patient is being stabilised for definitive treatment. In the past, sterile roller gauze had been used to pack the uterine cavity to reduce blood loss during massive PPH caused by uterine atony (Douglass, 1955)30.

It has been estimated that worldwide over 125,000 women die of postpartum hemorrhage (PPH) each year. PPH complicates approximately 3.7% of vaginal and 6.4% of caesarean delivery. In India 25.6% of maternal deaths are due to hemorrhage. Uterine atony accounts for 75%-90% of primary PPH28.

The traditional management of this condition begins with conservative methods such as bimanual compression, medical therapy with uterotonic agents, uterine temponade with balloons and occasionally arterial embolisation; the failure of which often mandates surgical intervention. Surgical measures such as ligation of the major pelvic vessels demand a rarely used skill possessed by few consultant. In the event of intractable hemorrhage despite the above measures hysterectomy is usually the final resort31.

The technique of packing of the lower uterine segment is described for use when local control of bleeding points is unsuccessful. Preservation of reproductive potential may be accomplished with this technique with minimal maternal morbidity32.

Pressure and tamponade are commonly used methods to control bleeding. Uterine packing applies these principles, making it a popular technique for over a century, whereas balloon tamponade is a more recent development.

Uterine packing is a quick, viable option to achieve hemostasis. Critics' concerns address the large quantities of blood that may be absorbed by the pack or hidden behind the pack before hospital staff can recognize that bleeding has continued. It may be performed in one of two acceptable trans vaginal methods; both using non-medicated, dry gauze.

The first technique of uterine packing employs a tubular packer, such as the Holmes or Torpin packer33. The cervix is exposed, then grasped securely with a sponge forceps or a tenaculum. The stylet or plunger of the packer is used to insert the gauze into the uterus until it is packed tightly all the way to the introitus.

In the second technique, a packing or dressing forceps is used to introduce the gauze into the uterus, using short

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strokes and taking care not to remove the tips of the forceps until the uterus and vagina are tightly packed. Broad-spectrum antibiotics should always be used prophylactically to prevent complications from sepsis. The pack can be left in place and managed in the same fashion as intra abdominal packing. To remove the pack, the patient should receive Oxytocin, which provides adequate muscle contraction and thus preventing the re-initiation of uterine bleeding.

An alternate method is balloon tamponade, Balloon tamponade has been used in different scenarios of uncontrolled bleeding, including esophageal varices, massive bladder hemorrhage and bleeding associated with prostatectomy. The general idea is to insert a sterilized balloon into the uterine cavity, then fill the balloon with warm water to see if additional pressure can control the patient's hemorrhage. Four methods have been described in the literature34-36.

In the original description of the 'tamponade test', a Sengstaken-Blakemore tube is used, prepared by cutting off the portion of the tube distal to the stomach balloon. Two pair of sponge forceps are needed: the first, used to grasp the anterior lip of the cervix and facilitates the placement of the balloon into the uterine cavity, held by the second pair of forceps. Warm saline was used to fill the balloon until it was visible at the cervical canal - using approximately 50-300 mL of fluid34-36.

Johanson, et al37, 2001 , described the same process using a Rusch balloon catheter, a type of urologic hydrostatic balloon catheter. The patient is placed in the Lloyd Davies position and a weighted speculum is used to insert the balloon into the uterine cavity. The balloon is inflated through the drainage port, using approximately 400-500 mL of warm saline.

Bakri, et al., 200138, developed 'the tamponade balloon' specifically for lower-uterine post-partum hemorrhage. The patient is placed in the lithotomy, or 'frog-leg' position and the distal end of the balloon catheter is inserted into the uterus through the cervix. A speculum is used to place vaginal packing, then the balloon is inflated with 250-500 mL of warm water. A Foley catheter may be used for this maneuver, using the largest caliber Foley catheter after first removing the portion of the catheter beyond the balloon attachment. The catheter is introduced through the cervix in to the uterus, and the balloon is filled with adequate fluid to provide a tamponade effect - 5 to 40 mL has been described as an appropriate amount. Clamping the catheter will provide additional pressure.

A successful tamponade demonstrates decreased or minimal bleeding after balloon inflation, thus terminating the need for surgical treatment. To help maintain the placement of the balloon, the upper vagina is packed with roller gauze. The previously placed Foley catheter should be kept in place to facilitate bladder drainage. Additionally, the previously started oxytocin infusion should be maintained for 12-24 hours and broad spectrum antibiotics are continued for three days to decrease the patient's risk for sepsis. After 24 hours of monitoring without subsequent bleeding, first the balloon is deflated but left in place. If no bleeding is seen after 30 minutes of observation, the oxytocin infusion is stopped and the patient is again monitored for 30 minutes. The balloon and vaginal packing may be removed if all bleeding has ceased.

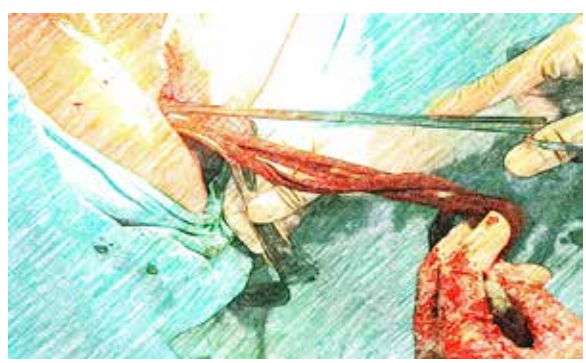
In the majority of cases (18out of19), the Bakri balloon was the first modality of treatment after medical management; in the remaining patient it was used after failure of compression sutures. In this patient with placenta praevia, B-Lynch sutures were applied followed by closure of the uterine wound, but the sutures broke following ongoing manipulations and a Bakri balloon was therefore inserted vaginally.

Additional treatment modalities were carried out in four cases39, including two that entailed uterine arterial embolisation and two for whom peripartum hysterectomy was carried out. In all four patients, continuous bleeding exceeded 500 mL (drained via a catheter), thus prompting further management. The overall success rate in preventing hysterectomy with the Bakri balloon catheter as the only procedure was 15 out of 19 (79%), and its success rate in conjunction with other procedures was 17 out of 19(89%).

In developing countries like ours, where health system is not well developed and other invasive procedures like compression suture, arterial embolisation, pelvic devascularisation by arterial ligation and uterine balloon tamponade which require more expertise and sophisticated technology are not always available, Uterovaginal packing by roller gauze may be a good substitute for uterine tamponade.

Uterovaginal packing can be done by less trained medical personnel and can be learnt easily by all members of obstetric team. All members of obstetric team should know how to insert uterovaginal pack because time is of essence in management of PPH.

SKETCH OF INTRA UTERINE PACKING BY VAGINAL ROUTE IN NORMAL DEVLIVERY



MATERIAL AND METHODS

This is a prospective study of 100 cases of Primary PPH in vaginal delivery and caesarean section. Intrauterine packing was done with a variable length of sterile ribbon gauze. Vaginal route was used for woman who developed PPH after vaginal delivery. Firm packing was done in layering ribbon gauze from fundus to cervix. In case of caesarean section incision was closed, tip of ribbon gauze was observed for soakage.

STUDY VENUE

Umaid Hospital, Department of Obst and Gynae, Dr. S.N. Medical College, Jodhpur.

INCLUS5ION CRITERIA

All cases of primary PPH either vaginal delivery or caesarean section were managed by intrauterine packing.

EXCLUSION CRITERIA

1. Woman with Secondary PPH
2. Woman with Genital Tract Laceration.

METHOD

This prospective interventional study was conducted at the Department of obstetrics and gynaecology, Dr. S.N. Medical College, Umaid Hospital, Jodhpur.

Intrauterine packing was done by using 8-10 meter gauze starting from the fundus with the help of sponge holding forceps up to the cervix. Vagina was also firmly packed for additional pressure to the uterine packing. Care was taken to observe the strict aseptic measures.

Postoperative complications were noted and patients were followed for upto six weeks in the outpatient clinic. Procedure was considered safe if there were minimal or no complication while effectiveness was considered if bleeding stopped after packing and patients were Haemodynamically stable. All information was collected on self made proforma.

Caesarean delivery was done under epidural analgesia or general anesthesia according to the patient's condition.

After securing bilateral uterine incision angles, uterus was packed with folded sterile gauze about 2m long and 10cm wide gauze in layers through the caesarean incision from one cornua to the other with a sponge holding forceps or with the help of the index and middle finger, from the fundus into the lower uterine segment with its end passing through the cervix into the vagina.

Uterine packing should not be too tight or loose but adequate to create pressure to prevent bleeding without leaving empty space in uterine cavity. Incision in lower segment was sutured continuously in two layers taking care not to include inadvertently the gauze into the sutures.

Prophylactic broad-spectrum intravenous antibiotics coverage was used in all cases. Patients vital signs were taken every hour and vaginal bleeding was assessed. After giving mild sedative drugs, uterine packing was removed after 24-48 hours of insertion. According to the amount of blood loss and preoperative hemoglobin level blood transfusion was given.

Patients were examined in lithotomy position to exclude genital tract trauma, retained products of conception or blood clots in the uterine cavity as a cause of bleeding. Vaginal speculum was then inserted, anterior lip of the cervix held with a sponge holding forceps and the uterine cavity packed firmly with sterile gauze starting from the fundus downwards.

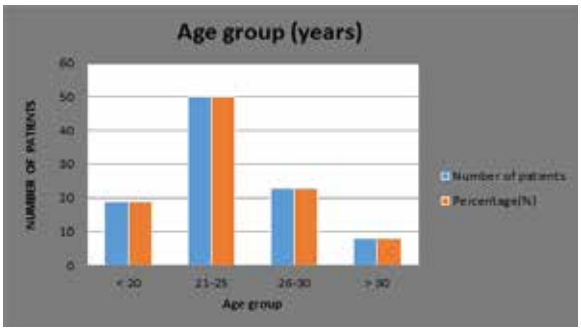
Once uterine cavity was tightly packed, vagina was packed as well with about six inches of gauze hanging outside the vagina. Approximately 2-3 roles of gauze about 4 to 5 meters in length were used. Postoperatively intensive monitoring, replacement therapy and removal of pack was done after 24 to 48 hours.

OBSERVATIONS

TABLE/FIGURE NO. 1

AGE WISE DISTRIBUTION OF PATIENTS

Age group	Number of patients	Percentage (%)
≤20	19	19%
21-25	50	50%
26-30	23	23%
>30	8	8%
Total	100	100%

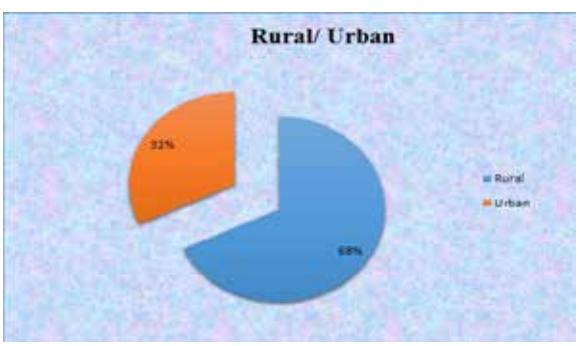


Represents age wise distribution of 100 casyears and 8% patients were above age of 30 years.es 19% patients were below 20 years, 50% patients were between 21-25 years, 23% patients were between 26-30 years and 8% patients were above age of 30 years.

TABLE/FIGURE NO.2

DISTRIBUTION OF CASES ACCORDING TO RURAL AND URBAN POPULATION

Area	Number of patients	Percentage (%)
Rural	68	68%
Urban	32	32%
Total	100	100%

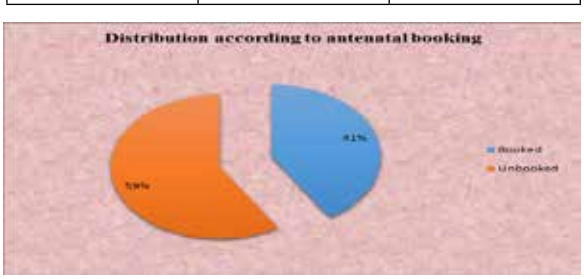


This table shows that 68% of total patients came from rural area and 32% from urban area.

TABLE/FIGURE NO.3

DISTRIBUTION OF CASES ACCORDING TO ANTENATAL BOOKING

Cases	Number of patients	Percentage (%)
Booked	41	41%
Unbooked	59	59%
Total	100	100%



This table shows that 59% cases of the total cases were emergency admissions and were unbooked while 41% cases were booked admissions.

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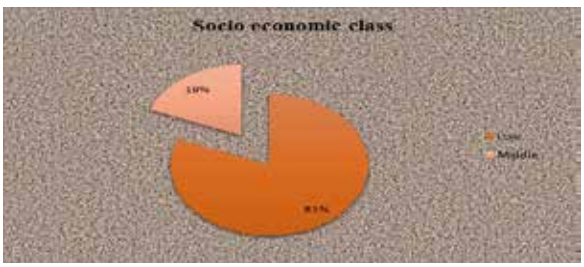
TABLE/FIGURE NO.4
DISTRIBUTION OF PATIENTS ACCORDING TO SOCIO ECONOMIC STATUS

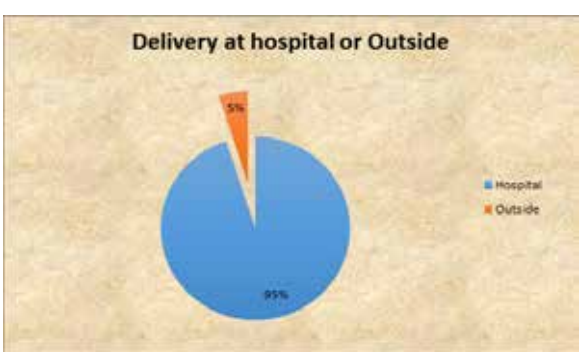
Socio economic status	Number of patients	Percentage (%)
Low	81	81%
Medium	19	19%
Total	100	100%



Above table shows that 81% of total cases were from low socioeconomic status while 19% patients were from middle class status.

TABLE/FIGURE NO.5
DISTRIBUTION OF PATIENTS ACCORDING TO PLACE OF DELIVERY

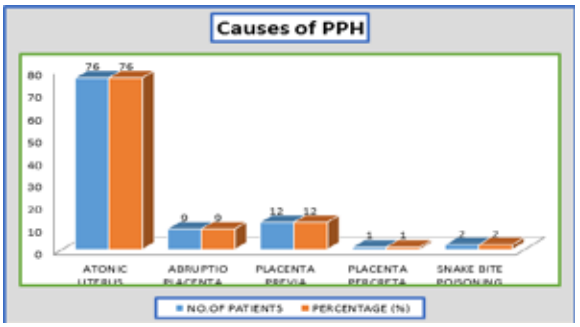
Place of Delivery	Number of patients	Percentage (%)
Inside Hospital	95	95%
Outside Hospital	5	5%
Total	100	100%



This table shows that out of 100 patients,95% patients had delivery in our hospital while 5% patients had delivery in Peripheral hospital.

TABLE/FIGURE NO.6
DISTRIBUTION ACCORDING TO CAUSE OF PPH

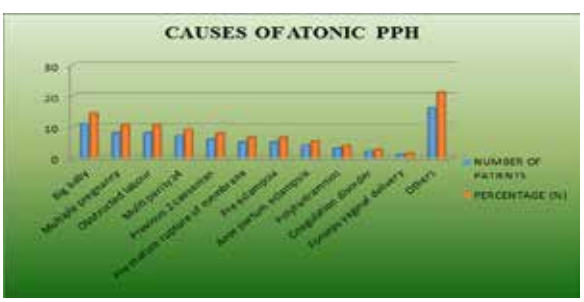
Causes of PPH	Number of patients	Percentage(%)
Atonic uterus	76	76%
Abruptio placenta	9	9%
Placenta previa	12	12%
Placenta percreta	1	1%
Snake bite poisoning	2	2%
Total	100	100%



Above table shows causes of PPH which occurred due to atony in 76% patients followed by placenta previa in 12%.

TABLE/FIGURE NO.7
DISTRIBUTION ACCORDING TO CAUSES OF ATONY

Causes of PPH	Number of patients	Percentage (%)
Big baby	11	14.47%
Multiple pregnancy	8	10.52%
Obstructed labour	8	10.52%
Multi parity ≥4	7	9.21%
Previous 2 caesarean	6	7.89%
Pre mature rupture of membrane	5	6.57%
Pre eclampsia	5	6.57%
Ante partum eclampsia	4	5.26%
Polyhydramnios	3	3.94%
Coagulation disorder	2	2.63%
Forceps vaginal delivery	1	1.31%
Others	16	21.05%
Total	76	100%



Above table shows causes of atonic PPH

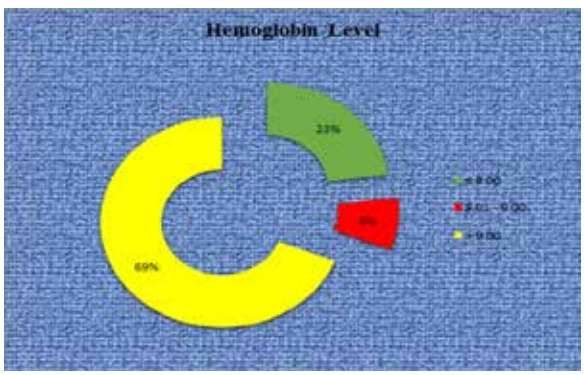
TABLE/FIGURE NO.8
DISTRIBUTION OF PATIENTS ACCORDING TO MODE OF DELIVERY

Mode of Delivery		Number of patients	Percentage (%)
LSCS		77	77%
NORMAL DELIVERY	Inside hospital	18	18%
	Outside hospital	5	5%
Total		100	100%

This figure shows that out of 100 patients,77% patients underwent caesarean section while 21% patients had normal delivery. 5 Delivered patients were refered from peripheral hostipal on account of PPH.

TABLE/FIGURE NO.9
DISTRIBUTION OF PATIENTS ACCORDINGTO HEMOGLOBIN LEVEL DURING ADMISSION

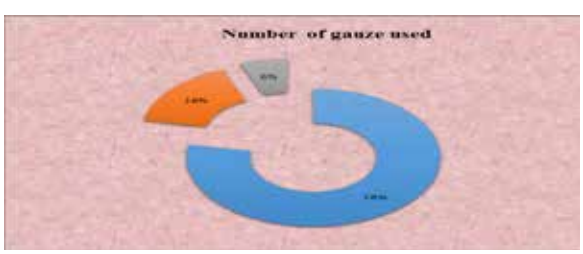
Hemoglobin(Hb)%	Number of patients	Percentage (%)
≤ 8.00	23	23%
8.01 - 9.00	8	8%
> 9.00	69	69%
Total	100	100%



This table shows that 69% patients had Hb more than 9gm%while 23% had Hb less than 8gm%.

TABLE/FIGURE NO.10
DISTRIBUTION OF PATIENTS ACCORDING TO NUMBER OF ROLLER GAUZE USED(1 ROLLER GAUZE=1mt)

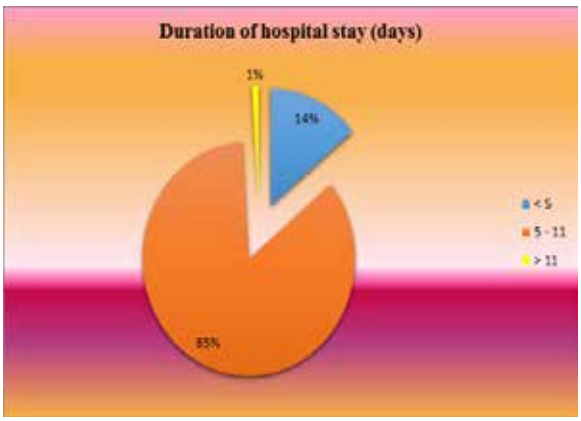
Number of roller gauze used	Number of patients	Percentage (%)
<3	78	78%
3	16	16%
>4	6	6%
Total	100	100%



Above table shows that less then 3 roller gauze were used in 78% patients,3 roller gauze were used in 16% patients and more than 4 roller gauze were used in 6% patients.

TABLE/FIGURE NO.11
DISTRIBUTION OF PATIENTS ACCORDING TO HOSPITAL STAY

Duration of hospital stay(in days)	Number of patients	Percentage (%)
≤5	14	14.00 (%)
5 - 11	85	85.00 (%)
> 11	1	1.00 (%)
Total	100	100.00 (%)



This table shows that 85% patients had hospital stay between 5-10 days, 14% patients had stay for less than 5 days while 1% stayed for more than 11 days. Patient with stay more than 11 days was referred on account of PPH developed sepsis after hysterectomy.

FIGURE NO.12
DISTRIBUTION OF PATIENTS ACCORDING TO EFFECTIVITY OF PACKING

Effectivity	Number of patients	Percentage (%)
Effective	98	98%
Ineffective/STAH	2	2%
Total	100	100%

Above figure shows that out of 100 patients, packing was effective in 98% patients. In 2% patients it was ineffective needed STAH.

Both patients were multigravida.One had placentae percreta while other had obstructed labour.

DISCUSSION

A variety of various methods have been proposed to avoid maternal mortality and morbidity due to PPH. Each has its advocates and is associated with identifiable benefits, uterine packing is safe and relatively noninvasive and can avoid a laparotomy.

In the present study, Among 100 patients who underwent intrauterine packing, 50 patients were in the age group of 21 -25 year and only 8 patients were above age of 30 years. 95(95%) patients had delivery in our hospital and 5(5%) patients were reffered from outside, 41 patients were booked (41%) in present study.

68 patients were from rural area and 81 % cases were from low socioeconomic status Uterine atony unresponsive to oxytocics was the commonest cause of postpartum hemorrhage, seen in 76 patients followed by placenta previa in 12 patients.

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Robert C. Maier20 in his retrospective review of 9 cases of primary PPH showed a success rate of 77.78% , 2 cases in which packing was unsuccessful cause of haemorrhage was uterine atony and placenta previa, This correlates with present study as in 2 failed cases cause of haemorrhage was uterine atony.

Sherry Boschert24 reported success rate of 66.66% after uterine packing.

Study conducted by Ali et al23 showed 86% success rate, while another study conducted by ShujaS25 showed 82.1% success rate.

In developing countries like ours, where health system is not well developed and other invasive procedures like compression suture, arterial embolisation, pelvic devascularisation by arterial ligation and uterine balloon tamponade which require more expertise and sophisticated technology are not always available, Uterovaginal packing by roller gauze may be a good substitute for uterine tamponade.

The technique of packing of the lower uterine segment is described for local control of bleeding points. Preservation of reproductive potential may be accomplished with this technique with minimal morbidity Historically, packing of the uterine cavity for post partum hemorrhage was endorsed by many standard textbooks of the 1930's and 1940's. Williams Obstetrics supported the practice until the tenth edition.

Druzin46 described a technique of packing the lower uterine segments at cesarean section for hemorrhage associated with placenta praevia and focal accreta. He used this technique only after attempting suture ligation of the bleeding sites and after bilateral uterine artery ligation failed to control the bleeding in the lower uterine segment.

Comparing the results of postpartum morbidity, a study by Hsu et al9 to determine safety and effectiveness of uterine packing for stopping hemorrhage in patients following delivery and pregnancy termination, a total of 9 patients were identified. One patient had failure of packing resulting in postpartum hysterectomy.There was no significant morbidity secondary to packing. In the present study 2 out of 100 patients needed hysterectomy.

In a recent review of obstetric records at the Children's Hospital of Buffalo, New York, 9 cases of uterine packing were reported over a 9-year period (5 during cesarean, 2 after vaginal delivery, and 2 after dilatation and evacuation) 9. Although the incidence of blood transfusion was not reduced, as 8 out of 9 required transfusion and the average blood loss as 2200 mL, packing was successful to stop the hemorrhage in 8 out of 9 cases; in only 1 case, hemorrhage continued and a hysterectomy was done. Thus, uterine packing was associated with decreased incidence of hysterectomy. This is in accordance with present study.

According to Robert C. Maier20 , the procedure has rarely been associated with concealed haemorrhage when properly performed. We found this statement to be true as none of our 98 successful cases had concealed haemorrhage,as was seen in the present study. A good packing technique involves careful layering of ribbon gauze pack and it was recommended that packing should be practiced even at tertiary hospitals as primary measure to control PPH.

Interval for removal of pack has to be individualized according to the clinical findings. Pack was removed earliest at 12 hours and maximum at 24 hours in successful cases in present study. Robert C20 reported earliest removal of pack at 5 hours and latest at 96 hours.

Dildy et al (2002)40,Maier et al (1993)41 concluded, uterine packing as safe, quick and effective method for controlling PPH. But, after the 1950s, uterine packing for management of PPH was disfavoured because it was a potentially traumatic and time consuming procedure. Risk of development of infection and concealed ongoing haemorrhage also rendered this procedure a non physiological approach.

Subtotal hysterectomy is a radical procedure that causes undesirable side effects of reproductive sterility, secondary ammenorrhoea, and physical and psychological trauma.

Our observations are similar to the observations made by Nwagha et al (2005)42 who have found uterine packing effective in 20 patients. Though they did intra uterine packing intra operatively only in patients who had delivery by caesarean section where as we have used uterine packing both in patients who had PPH following vaginal delivery and caesarean section. In present study of 100 patients 77 patients had caesarean section and 23 patients had vaginal delivery as far as mode of delivery is concerned.

In our observation, we found thatsuccess rate of uterine packing is more in youngerpatients and gradually decreased with increase in age and parity . Incidence of abdominalhysterectomy was more in patients with parity 4 or more. This is similar to the observations made by Ozden et al.

The relative increase in the incidence of failure of uterovaginal packing with increase in parity (3 or more) and need of other surgical intervention may be explained by the fact that in multiparous uterus collagen tissues are deposited in between the muscle fibres of uterus as mentioned in Dutta (2004)43.

Average blood loss in this study is comparable to previous studies . In present study, we observed that requirement of blood transfusion has increased with increase of age and parity . This is probably due to presence of pre existing anaemia, less contractile uterine muscular tissue in multiparous women as mentioned in Dutta (2004)43.

There is no randomized controlled trial but only some case series by Maier et al (1993)41, Nwagha et al (2005)42, Haq et al (2005)44 and case report by Bagga et al (2004)45 have been published about the effectiveness of uterine packing. All the case series and reports have concluded that it maybe a reasonable alternative to further surgical intervention in patients with intractable post partum haemorrhage.

Uterine packing needs to be remembered as a management option before performing surgical procedures in PPH resulting from placental site bleeding, coagulation failure or atony. It may control the problem completely or give time to organise a definitive procedure which may include transportation to another centre,In present study out of 5 patient that delivered outside 2 patients came from periphery with intrauterine packing insitu of which 1 patient landed up in hysterectomy. Thus packing no doubtedly help in buying time at need of hour. If a correctly placed pack is unable to control haemorrhage, repacking is not advocated and other therapeutic options should be considered.48

There are different modalities of intraoperative management of postpartum hemorrhage due to placenta previa/ accreta including tamponade techniques (Foley catheter,

Sengstaken-Blakemore tubeand SOS Bakri tamponade balloon), uterine artery ligation, and embolization, hypogastric artery ligation are used to decrease the degree of post partum hemorrhage, however, hysterectomy is used when conservative measures have failed8.

One recent study by Doumouchtsis et al (2007)4 comparing compression suture, arterial embolisation, pelvic devascularisation by arterial ligation and uterine balloon tamponade concluded that there was no significant difference in success rates among these procedures and they have recommended uterine balloon tamponade as first step in the management of intractable PPH which is not due to genital trauma or retained tissue, and which does not respond to medical treatment.

Another reason put forth by detractors of the procedure was adherence of packing material to bleeding surface, followed by delayed haemorrhage by dislodging the clot after removal of pack. The problem had been addressed by J. R. Wax et al47 in their case report in which they successfully tried to avoid adherence by using a non adherent bag interposed between bleeding surface and pack. In this study, in spite of difficult removal in four cases, no patient suffered from delayed haemorrhage.

In present study, 3 patients had developed fever and 1 patient develop urinary tract infection and this may be reduced by use of broad spectrum antibiotics and removal of the pack within 24 hours as confirmed byMaier's study.

There was no maternal death from post partum hemorrhage due to placenta previa/accreta during the study period. Placenta previa/accrete not only increases maternal mortality and morbidity, but also it increases the perinatal mortality and morbidity as a result of increase iatrogenic preterm delivery because of its association with antepartum hemorrhage.

Uterovaginal packing can be done by less trained medical personnel and can be learnt easily by all members of obstetric team. All members of obstetric team should know how to insert uterovaginal pack because time is of essence in management of PPH.

Careful selection of cases, aseptic technique, use of prophylacticantibiotics and not leaving the pack beyond 36 hours of insertion are important measures to minimize infection.Still there are reports of pack having been removed after 48 hours without any increase in infectious morbidity .

Many authors stated that uterine packing should be abandoned because of concealed haemorrhage, uterine infection and delayed haemorrhage. Maier41 and other investigators showed that these complications are very infrequent and should not be a contraindication to thispotentially life-saving tool for PPH, As has been further proved in present study.

INTRA UTERINE PACKING DURING CAESREAN SECTION

CONCLUSION

Results of present study show that utero vaginal packing is effective in arresting the bleeding due to Primary PPH.

In our setup, with limited and overburdened resources, utero vaginal packing still retains an important role in emergency obstetrics.

It is cost effective as well.

All that is required to accomplish packing is a sponge holding forceps and sterile ribbon gauze. Patient at primary and secondary health care set up can be managed easily by intrauterine packing, it buys them time while transporting them to tertiary hospital.

JSSK and MMNDY scheme launched by GOVT provides free health care services to these patients, more patients attend antenatal clinics, high risk PPH prone patients could be screened and followed till delivery and can be managed effectively, this is indeed helping in bringing down maternal mortality rates . A Ray of Hope for such under privileged patients.

Every obstetrician should be familiar with the technique of packing as this may save life, avoid laparotomy and conserve uterus.

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ABBREVIATIONS

A	-	ATONY
AP	-	ABRUPTIO PLACENTAE
FI	-	FAILED INDUCTION
FP	-	FAILED PROGRESS
OLIGO	-	OLIGOHYDRAMNIOS
PP	-	PLACENTAL PREVIA
BB	-	BIG BABY
CPD	-	CEPHALOPELVIC DISPROPORTION
BT	-	BLOOD TRANSFUSION
OL	-	OBSTRUCTED LABOR
TVD	-	TWIN VAGINAL DELIVERY
MP	-	MULTIPARITY
FD	-	FETAL DISTRESS
SBP	-	SNAKE BITE POISIONING
PPR	-	PLACENTA PERCRETA
STAH	-	SUBTOTAL ABDOMINAL HYSTRECTOMY
BOH	-	BAD OBSTETRIC HISTORY
T	-	TWIN
APR	-	ABNORMAL PRESENTATION
LAP	-	LAPAROTOMY
APE	-	ANTEPARTUM ECLAMPSIA
QDP	-	QUADRIPLET PREGNANCY
PE	-	PRE ECLAMPSIA
FVP	-	FORCEPS VAGINAL DELIVERY
HP	-	HAND PROLAPSE
PB	-	PRIMI BREECH
PROM	-	PREMATURE RUPTURE OF MEMBRANE
IUD	-	INTRA UTERINE DEATH
ND	-	NORMAL DELIVERY
CS	-	CESAREAN SECTION
2CS	-	2 CESAREAN SECTION
JSSK	-	JANANI SHISHU SURAKSHA KARYAKARM
MMNDY	-	MUKHYA MANTRI NI SHULK DAVA YOJNA