President's Message

We the team of 2007 has taken it with great dedication as a part of our philosophy for the year FOGSI cares-2007. Under this we have planned a series of knowledge spreading interventions through Gyan-Abhiyaan. One of this is Gyan-Prakashan (publications) spreading knowledge about different aspects of the subject. The current FOGSI Focus comes to you through this endeavor.

Under the philosophy of FOGSI Cares-2007- we have a theme, Obstetricians For Eclampsia And Hemorrhage Free India. So as to provide the obstetricians - members of FOGSI, Dr. Atul Munshi, our Senior Vice-president has rightly planned this issue of FOGSI focus on "PPH"- QUO VADIS (where are we - where are we going). We the team of FOGSI 2007 sincerely hope that this issue FOGSI Focus will refresh you knowledge of the present and future of post-partum hemorrhage lethal condition

Dr. Pankaj Desai
Vadodara

From the Editor's Desk

Post Partum Hemorrhage is a major cause of maternal suffering in the developing world.

FOGSI cares for the patients suffering from this avoidable cause of maternal morbidity and even mortality.

FOGSI also cares for Doctors looking after these mothers - especially information, awareness and their training aspect.

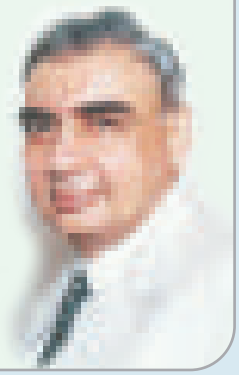
This issue of FOGSI Focus, therefore discusses PPH Quo Vadis-Where are we (Present), Where are we heading (Future)!

We have galaxy of contributors, expert in the field to address the issue. Many innovative ideas and future prospects are shared.

It is almost impossible to cover all aspects of the subject, This is an effort to include practical and clinically relevant details of PPH. It will be helpful to our practicing colleagues and post-graduate students.

If this issue stimulates, few of our members to take up the challenge of fighting this avoidable evil, we feel our efforts are worthwhile!

Wish you all a memorable & eventful 2007!



Dr. Atul Munshi
Ahmedabad

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Introduction PPH

Dr. Mahendra N. Parikh
Mumbai

The traditional definition of postpartum hemorrhage (PPH) is a blood loss of 500 mL or more. Ratnam and Rouff [1] state that most Asian women have smaller built, lesser blood volume, lower hemoglobin, and poor nutrition. Because of these facts even a lesser blood loss has a more sinister effect. Hence, they advocate 300 mL of blood loss as a definition of PPH. Another definition of PPH is a quantum of blood loss resulting in 10% drop in hematocrit. This a good definition but it is more theoretical than practical. A South African study defines PPH as more than usual blood loss [2]. But this definition relies on individual perception and hence lacks uniformity which is necessary for comparison. With such diversity there is a need for a universal definition of PPH although a blood loss of 500 mL or more is a most widely accepted definition. In any case in clinical practice the quantum of blood loss is difficult to measure while it is the impact of blood loss as is apparent from the patient's vital parameters and general condition that guides the management.

Globally about 11% of women having live births have severe PPH amounting to 14 million women a year [3]. The major burden of this is borne by women in underdeveloped and developing countries. Desai and Jani [4] quote the incidence of PPH to be 3-6% of all normal deliveries. The incidence is higher in operative deliveries especially when conducted under general anesthesia. The incidence is said to be 3.9% in vaginal deliveries and 6.4% in cesarean deliveries. Pregnancies having hypertension, antepartum hemorrhage, multiple gestation, overdistended uterus, uterine fibroids etc. have a much higher incidence of PPH. An overall incidence of 10% appears realistic. Expectant management of third stage of labor and

mis management of third stage obviously result in a much greater incidence of PPH. In rural India, where women have no access to trained birth attendant the incidence of PPH is bound to be high though precise reliable figures are not available. There is no doubt that postpartum blood loss is underestimated to the extent of 30-50%. The factual incidence of PPH is difficult to arrive at barring deliveries in teaching hospitals and in hospitals offering good obstetric services.

The consequences of PPH are disastrous and lead to maternal deaths and morbidity. PPH is a major cause of maternal death. Severe PPH kills 1,40,000 women yearly [3]. In India PPH is responsible for 15.15% maternal deaths according to Mukherjee et al [5], 25.87% according to Patel et al [6], and 11.7% according to Bedi et al [7]. In South Africa 40% of deaths from PPH occur at district hospitals [3]. Although reliable data is lacking situation in India must be similar. Morbidity from PPH mainly includes surgical interventions, sepsis and severe anemia. Twelve percent of women with PPH end up with severe anemia [3]. Of the emergency obstetric hysterectomies 9.83% were for atomic PPH in Sinha et al's [8] study and 10.3% in Mukherjee et al's [9] study. In view of the crippling consequences the incidence of PPH must be decreased. As obstetric care improves the incidence of PPH decreases and maternal deaths from PPH drastically reduce. In United Kingdom, during the three years from 1997 to 1999, there

was only one maternal death from PPH out of a total of 271 maternal deaths, a mere 0.37% [10]. Uterine atony is the most common cause of PPH. It is the undue haste and impatience during the third stage of labor that results in atonic PPH during normal delivery, operative vaginal delivery, and cesarean section. FOGSI's projects of EMOC (emergency obstetric care) and of training birth attendants will definitely reduce the incidence of PPH in rural India in future. Active management of third stage of labor brings meaningful reductions in the incidence and severity of PPH [11]. To overcome the shortage of manpower in primary health centers, WHO provides prefilled syringes containing ergometrine. Misoprostol has great utility in obstetric practice. It can be administered orally, sublingually and rectally. In addition it needs no refrigeration, has a long shelf life, is cheap, and carries no deterent side effects like causing hypertention and nausea or vomiting. It is an ideal drug for preventing PPH in rural India. It's role in reducing postpartum blood loss is now well established although it's superiority over oxytocin and ergometrine awaits further studies. The increasing adoption of misoprostol use for preventing PPH will definitely reduce the incidence of PPH and resultant mortality and morbidity in near future. It would however be mandatory to take necessary steps to prevent misuse of misoprostol during pregnancy and earlier stages of labor especially in rural practice.

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"Women are not dying because of a disease we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving."

- Mohd. Fathalla, President of FIGO-1997

Prediction & Prevention of PPH

PPH as a cause of maternal death in India:

A sample survey of maternal mortality in India was conducted by the Medical Nomenclature/Norms and Research Records committee of FOGSI for the year 2004-2005. Of the 4420 maternal deaths reported amongst 1253696 deliveries (MMR- 353/100,000), 22% of the deaths were due to postpartum haemorrhage. An estimated 26 million births occurred in India during 2004, with an estimated 24,000 maternal deaths due to postpartum haemorrhage! Nearly two-thirds of the maternal deaths occur in the Empowered Action Group (EAG) States including Uttar Pradesh, Uttaranchal, Madhya Pradesh, Chhattisgarh, Rajasthan, Jharkhand, Bihar, Orissa and Assam. Large percentage of women in rural India delivers at home without a skilled attendant. Only about 28% of all births in India during 2003 occurred in private or public institutions (2).

Prediction of PPH:

To predict and prevent we must be aware of the causes. It is impossible to consistently identify women at increased risk of PPH, although several factors have been identified as risk factors. Factors that affect the uterine contraction or the tone are over distension of the uterus as in polyhydramnios and multiple gestations. Other causes leading to atonic PPH are multi-parity, previous PPH, pre-eclampsia, placenta praevia, placental abruption, prolonged labour, infection and operative deliveries. However, two-thirds of PPH cases occur in women with no identifiable risk factors. Hence it is important to take preventive steps against PPH in all women at delivery. It is important to remember that blood loss up to 1000 ml may not result in fall in blood pressure and signs of shock. Blood loss up to 1500ml may result in slight fall in BP and only when the blood loss is more than 2000 ml, marked fall in BP with evidence of shock manifested

Prevention of PPH:

Active management of third stage of labor is evidence based, feasible and low-cost intervention to prevent postpartum haemorrhage and can prevent 60 to70 percent of atonic

Prof. P. K. Sekharan
Trivendrum

PPH. Active management of third stage of labor should be offered to all women in labour, as the presence of risk factors cannot predict all cases of postpartum haemorrhage.

Active Management of Third Stage of Labour: Active management of the third stage of labour consists of measures to speedup the delivery of placenta and to prevent PPH by averting uterine atony. The components are: (1) giving an uterotonic drug within one minute of birth of the child; (2) clamping and cutting the cord soon after birth; and (3) applying controlled cord traction with simultaneous counter-pressure to the uterus supra-pubically. After the delivery of the placenta, give gentle massage of the uterus to promote uterine contraction and to minimize bleeding. Active management of third stage of labour was associated with reduced maternal blood loss, reduced postpartum anaemia, and less requirement for blood transfusion (3).

Uterotonic drugs:
The administration of a uterotonic drug immediately after the delivery of the child is the most important intervention to prevent PPH. Oxytocin has proven to be very effective in reducing the incidence of PPH and prolonged third stage of labour (4). Methyl ergometrine combined with Oxytocin (Syntometrine, Oxymetrine etc.) appears to be more effective than Oxytocin alone. Syntometrine is associated with more side effects, such as headache, nausea, vomiting and rise in blood pressure (5).

Oxytocin: Oxytocin (Pitocin) 10 units given I/M immediately after delivery of the child can result in 70% reduction of atonic PPH. Pitocin 10 units may be added to 500 ml of crystalloid solution and given intravenously at a rate of 100 ml/h. Oxytocin is the current drug of choice for prevention of PPH. The main advantages are rapid onset of action and the lack of side effects. Oxytocin does not increase the risk of retained placenta or the duration of third stage of labour.

Methyl ergometrine is given in dose of 0.2mg I/M or I/V at delivery of the anterior shoulder or immediately after the delivery of the baby to prevent PPH is effective but causes nausea and vomiting and increase in BP compared to oxytocin.

Syntometrine or Oxymetrine- Combination of ergometrine and oxytocin (ergometrine0.5mg and oxytocin 5 units) given intramuscularly immediately after the delivery of the child is associated with a small but statistically significant reduction in PPH compared to giving oxytocin alone.

Misoprostol for prevention of PPH
Misoprostol is a synthetic analog of prostaglandin E1, originally marketed for the prevention and treatment of peptic ulcer. Like other uterotonics, misoprostol causes the uterus to contract and thus can reduce postpartum bleeding. It has other potential benefits including ease of administration (oral or rectal) low cost and stability. Rectal misoprostol 600 μgm is as effective as oxytocin in prevention of PPH. In the treatment of PPH, 1000μgm of rectal misoprostol had uterotonic effect within 5 minutes in cases not responding to oxytocin or ergometrine.

Carboprost: Carboprost is a synthetic analog of prostaglandin given intramuscularly in dose of 250μgm. The uterotonic effect is seen within 5 minutes and action lasts for one hour. It should be given with caution in patients with asthma, hypertension and renal and hepatic disease.

Restrictive Episiotomy: Bleeding from episiotomies may contribute to postpartum haemorrhage. Avoidance of unnecessary episiotomies may contribute to the reduction in blood loss after delivery.

The prophylactic use of oxytocin in a dose of 10 units I/M or 20 units in 500 ml of normal saline intravenously at 100 ml/h reduces postpartum haemorrhage. Practice active management of third stage of labour in all patients in labour. Recognize that primary postpartum haemorrhage is one of the top five causes of maternal mortality in both developed and developing countries.

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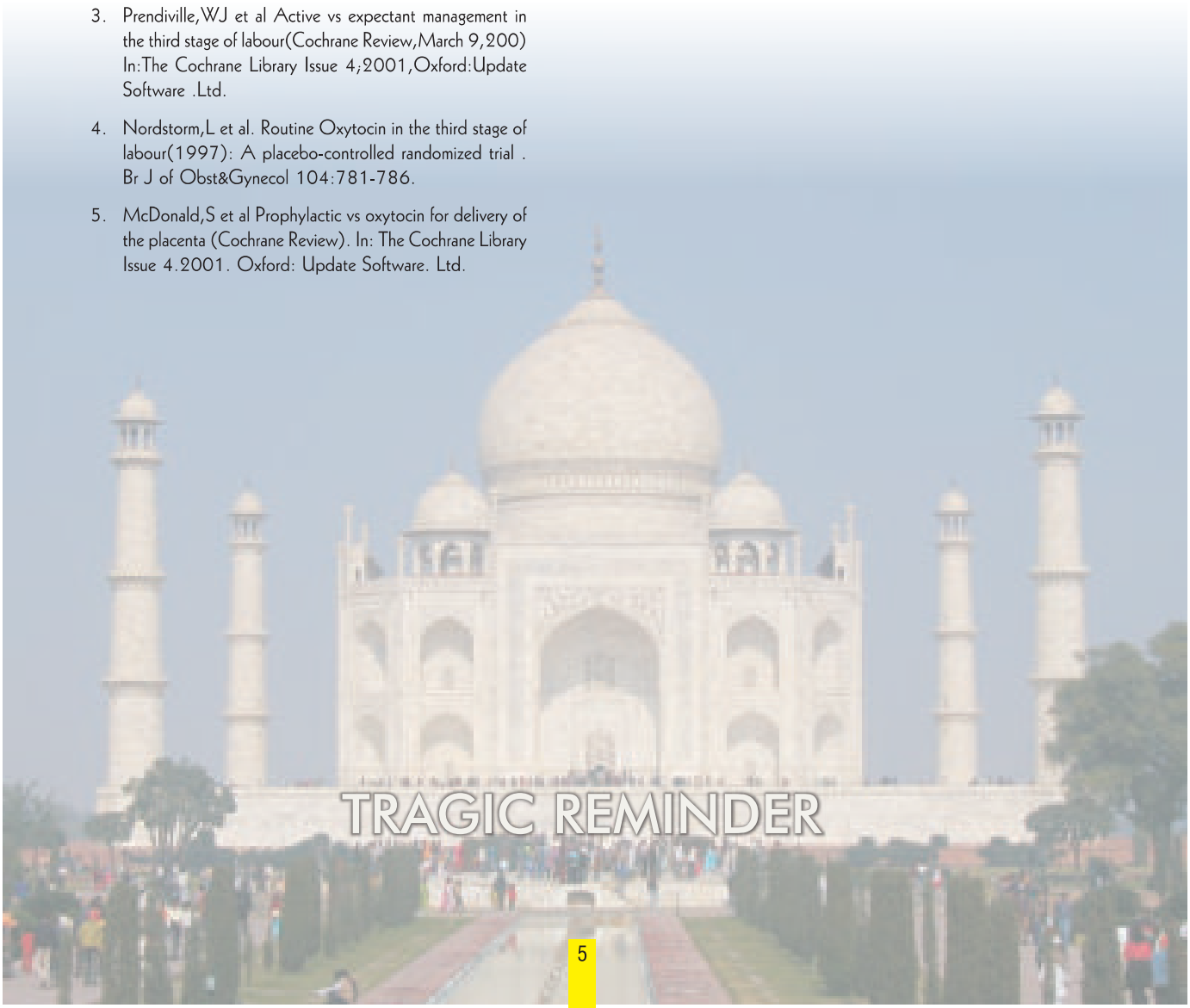

Possible causes of atonic PPH

Dr. Duru Shah
Mumbai

Postpartum hemorrhage is one of the major causes of Maternal Mortality and a redoubtable contributor to puerperal death from other causes like infection and renal failure. The WHO estimates that obstetric hemorrhage complicates 10.5% of all live births, 3/4th of which are because of postpartum hemorrhage.

Uterine atony, in which there is failure of the uterine muscle to contract normally following delivery of the baby and placenta, is responsible for upto 70% (1) of all causes of PPH. Normally bleeding from the severed vessels following delivery is stopped by contraction of the uterus and retraction of the vessels.

The possible causes for atonic PPH include

* Uterine overdistention
* Uterine fatigue
* Mismanagement of third stage of labor
* Antepartum hemorrhage
* Drugs
* Uterine inversion
* Other risk factors

Uterine overdistention:

Overdistention of the uterus can be caused by multifetal gestation, fetal macrosomia, polyhydramnios, fetal abnormality (severe hydrocephalus), failure to deliver the placenta or distention with blood before or after placental delivery.

Uterine Fatigue:

Poor myometrial contraction can result from prolonged labor or rapid forceful labor especially if stimulated. Cephao pelvic disproportion should be recognized in good time, and never permitted to eventuate in desultory labor. Labor can be prolonged many hours by starting continuously caudal analgesia prematurely. A significant increase in the rate of maternal blood loss was noted after long second stage (1.84 g/dl median difference between the intrapartum and post partum Hb level in comparison to patients with normal duration of second stage (0.7g/dl) (2) . Uterine atony follows precipitate labor as often as prolonged labor and one should be cautious about the induction of labor, as induced labor is often prolonged or precipitate. Induction of labor is significantly associated with greater mean blood loss at delivery compared with those not induced (5.8% vs 4.4%) (3).

Mismanagement of third stage:

More women die during the third stage of labor than during the first two stages combined. No attempts to deliver the placenta should be made until it has separated and the fundus is firmly retracted. Squeezing or kneading of the uterus should be avoided under all circumstances. A third stage of labor than 18 minutes is associated with a significant risk of PPH. After 30 minutes, the odds of having PPH are 6 times higher than before 30 minutes (4).

Antepartum Hemorrhage:
Antepartum bleeding predisposes to postpartum hemorrhage. Placental site in the lower uterine segment or Couvelaire uterus in abruptio placenta predispose to PPH.

Drugs:
Inhibition of contraction by drugs such as halogenated anesthetic agents, nitrates, NSAID's, magnesium sulphate, B-Sympathomimetics (tocolytics) and nifedipine can lead to atonic PPH.

Uterine Tumors and uterine inversion are rare but possible causes of PPH.

Uterine infection:
Several studies have reported an increased risk for postpartum hemorrhage following uterine atony in the presence of chorioamnionitis (5).

Most cases of postpartum hemorrhage can be anticipated, more can be prevented and all can be treated. The best treatment for PPH is its anticipation and prevention.

A full bladder, prolonged uterine exteriorization and hypothermia due to massive resuscitation should always be considered under relevant circumstances.

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SECONDARY PPH

- **Causes of Secondary PPH**
  - Uterine Infection
  - Retained Placental Fragments
  - Abnormal involution of placental site

- **Management of Secondary Postpartum Hemorrhage**

  - Medical
    Oxytocics
    Prostaglandins
    Antibiotics
    Tranexamic acid
    Vasopressin
    Clothing factor concentrates
    Chemotherapy (?)
    Oral Contraceptive Pill (?)

  - Surgical
    Uterine Evacuation
    Uterine tamponade balloon
    Uterine compression sutares.
    Hysterectomy
    Pelvic arterial ligation

  - Radiological
    Selective arterial embolization

Active Management of Labour for Prevention of PPH

Dr. Shirish N. Daftary
Mumbai

Dr. Shyam V. Desai
Mumbai

PPH is an obstetric emergency which every obstetrician has to face often unexpectedly. The incidence is between 3-6%, it continues to be a life threatening cause accounting for 25%-30% of maternal deaths in the developing countries.

Management of the 3rd. stage of labour: The traditional or physiological method (Brandt - Andrew Maneuver) advocates awaiting the signs of placental separation followed by controlled coed traction and Suprapubic pressure to assist expulsion of the placenta. Active management of the third stage of labour aims at producing strong uterine contraction with a uterotonic agent at the time of birth to assist placental separation and expulsion. This method reduces the duration of the third stage of labour whilst concomitantly reducing the total blood loss accruing during the third stage of labour. This method of management plays an important role in reducing the incidence of PPH and its attending complications. Active Management has now been widely accepted.

Uterotonic Agents evaluated: Several Uterotonic agents have been advocated and used in the active management of the third stage of labour. Oxytocin, ergometrine, prostaglandins and their derivatives have all been used successfully in active management of the third stage of labour. Opinions are divided about the best method to advocate. However a comparative evaluation would provide useful information to enable the obstetrician to make an informed choice.

Summary : Following is a summary of commonly used uterotonic agents.

Uterotonic Agents in the Active Management 3rd. Stage of labour

Medication	Dose	Route of Administration	Frequency of dose	Side-Effects	Remarks & Contraindic
Oxytocin	10-40 U/	i.v. / i.m./ Umb. Cord Vein, IMM or Intramyometrial	I.V.Infusion	Usually none Water overload	None-Action short lasting. Often needs another uterotonic agent in 20-30% cases
Ergometrine	0.25mg	i.m./ IMM	Every 2-4h.	↑B.P. Nausea & Vomiting	Hypertension PIH
15m PGF2?	0.125mg - 0.250 mg i.m.	i.m. / IMM	Every 15-90m for maximum of 8 doses	N&V, G.I.upset, Chills, Asthma Flushing	Cardiac, renal or Respiratory Disorders
PGE_2	20 mg oral	Oral / per Rectum	Every 2 h.	Same as above	Hypotension
Misoprostol	400-600 μg	Oral / PR / PV	Every 2-4 h.	Shivering, Fever	Pending FDA Approval

Oxytocin infusion used for induction or augmentation of labour should not be discontinued soon after delivery for fear of delayed atonic PPH. All patients should be closely watched for 2-4 hours after delivery to safeguard against delayed PPH. Prolonged infusion with high doses of oxytocin can cause water intoxication. The recent WHO recommendation of administering 20 units oxytocin soon after delivery has much to recommend for simplicity and efficacy in prevention of PPH, particularly in rural settings.

However the use of low dose of 125μg of PGF2? i.m. soon after delivery is not only efficacious, but also very effective.

Misoprostol has the advantage of low cost and easy storage, since it is free from the need for cold preservation. This makes its use particularly attractive in rural settings (Home delivery) where in the absence of a competent health professional. The TBA can insert 4 tabs. In the rectum. This helps to control blood loss and helps to buy time in case ptansfer of the patient to a hospitalbecomes necessary.

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Commoun Causes Traumatic - PPH

Dr. Mandakini Parihar
Mumbai

Taj Mahal -One of the Seven Wonders of the World, One of the Greatest monuments, dedicated to the memory of "Queen Mumtaz" by her husband "Emperor Sahajahan", is a testimony and a grim reminder of the tragedy of maternal mortality due to bleeding during child birth, that can befall any women in childbirth.

Post Partum Hemorrhage (PPH) is defined as blood loss of more than 500 mL following vaginal delivery or more than 1000 mL following cesarean delivery1. Post Partum Hemorrhage is a major cause of Maternal Morbidity and Mortality in our country and other developing countries. Postpartum hemorrhage (PPH) occurs in less than 5% of all deliveries but accounts for 15% of maternal deaths.9 Early postpartum hemorrhage occurs within 24 hours of delivery and is commonly due to uterine atony, a retained placenta, trauma during delivery, surgical injury related to cesarean delivery, or abnormal placentation. The commonest cause of PPH is atonic PPH followed by traumatice PPH. The causes and management of atonic PPh are cover in another part of this volume and hence we will only be discussing traumatic PPH in this article. Here is a "4 T's" mnemonic to remember causes of PPH: [2]

Tone, Tissue, Trauma, and Thrombosis

Common Causes of Traumatic PPH[3,4]

Here we can divide these into three groups depending on the type of delivery

1. Caesarian Section Delivery
2. Operative Vaginal Delivery
3. Normal Vaginal Delivery

Or we can divide it according to the type of trauma

1. Uterine rupture
   a. Scar dehiscence
   b. Ragged rupture
2. Hematomas
   a. Lower genital tract
   b. Upper genital tract esp. Broad Ligament Hematomas
3. Lacerations
   a. Cervical
   b. Vaginal
4. Tears and extensions
   a. Lower Genital Tract
      i. Vaginal Tears
      ii. Perineal Tears
      iii. Cervical Tears
      iv. Extension of the episiotomy
      v. Para-Urethral Tears
   b. Upper Genital Tract
      i. Extension of the Caesarian Scar -laterally
      ii. Extension of the Caesarian Scar- vertically

Causes of Traumatic PPH[5,6,7]

Damage to the genital tract may occur spontaneously or through manipulations used to deliver the baby. Cesarean delivery results in twice the average blood loss of vaginal delivery. Incisions in the poorly contractile lower segment heal well but are more reliant on suturing, vasospasm, and clotting for hemostasis.

* Any uterus that has undergone a procedure resulting in a total or thick partial disruption of the uterine wall should be considered at risk for rupture in a future pregnancy. This includes myomectomy; uteroplasty for congenital abnormality; cornual or cervical ectopic resection; and perforation of the uterus
* Trauma may occur following very prolonged or vigorous labor, especially if the patient has relative or absolute cephalopelvic disproportion and the uterus has been stimulated with oxytocin or prostaglandins.
* Trauma also may occur following extrauterine or intrauterine manipulation of the fetus.
* Trauma may result secondary to attempts to remove a retained placenta manually or with instrumentation.
* Cervical laceration is most commonly associated with operative vaginal deliveries, and the cervix should be inspected following all such deliveries. Assisted vaginal delivery (forceps or vacuum) should never be attempted without the cervix being fully dilated.
* Vaginal sidewall laceration is also most commonly associated with operative vaginal delivery, but it may occur spontaneously.
* Lower vaginal trauma occurs either spontaneously or because of episiotomy Spontaneous lacerations usually involve the posterior fourchette; however, trauma to the periurethral and clitoral region may occur and can be problematic.

Genital tract trauma - Diagnosis

Genital tract trauma is the most likely cause if bleeding persists or is present despite a well-contracted uterus. Use appropriate analgesia along with good lighting and positioning, which facilitates excellent exposure. If not already initiated, moving the patient to an operating room is reasonable at this time. Experienced assistants and an excellent circulating nurse are essential to identify where the bleeding is coming from. Use an absorbable, continuous interlocking stitch, and use tapered (rather than cutting) needles for all repairs except for the perineal skin. [8]

* Directly visualize and inspect the cervix with the aid of ring forceps by progressively "leap-frogging" the forceps ahead of one another until the entire circumference has been inspected…
* Lacerations of the vaginal vault must be well visualized and their full extent realized prior to repair. Lacerations high in the vaginal vault and those extending up from the cervix may involve the uterus or lead to broad ligament or retroperitoneal hematomas. The proximity of the ureters to the lateral vaginal fornices, and the base of the bladder to the anterior fornix, must be kept in mind when repair is undertaken in these areas. Poorly placed stitches can lead to genitourinary fistulas.
* Traumatic hematomas are rare and may be related to lacerations or may occur in isolation. They include vulvar and paravaginal hematomas in the lower genital tract and broad ligament and retroperitoneal hematomas adjacent to the uterus.
* Broad ligament and retroperitoneal hematomas9 are initially managed expectantly if the patient is stable and the lesions are not expanding. Ultrasound, CT scanning, and MRI all may be used to assess the size and progress of these hematomas. Consider involving a surgeon with extensive experience operating in the retroperitoneal space.

The new Emergency Obstetric Care (EmOC) Course started by FOGSI and ICOG should aim to reduce preventable causes of PPH and more importantly aim to see that adequate resuscitative measures would ensure many maternal deaths due to bleeding will be prevented.

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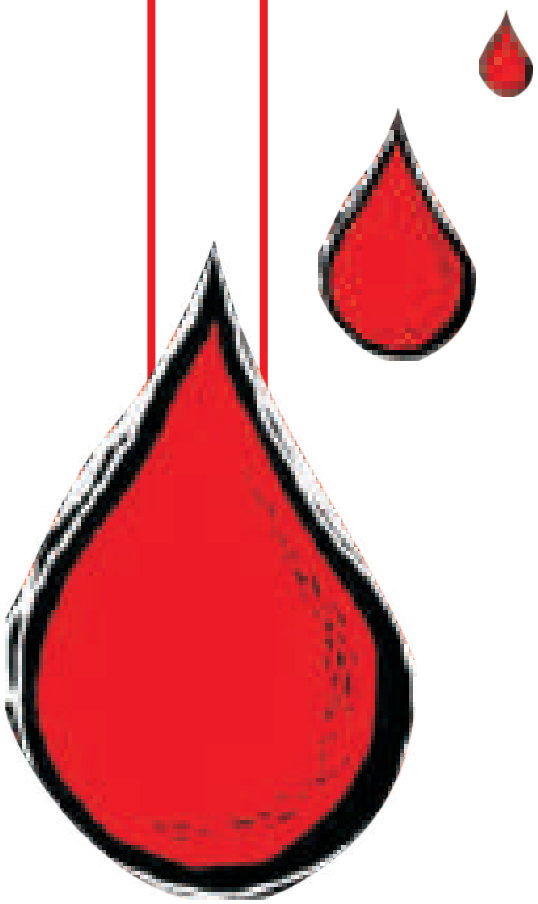

Drugs for PPH

Prof. Suneeta Mittal
Delhi

Postpartum hemorrhage (PPH) is an obstetrical emergency with an approximate incidence of 3% of births and can follow vaginal or cesarean delivery. It is a major cause of maternal morbidity and mortality, with several sequelae like shock, renal failure, acute respiratory distress syndrome, coagulopathy, and Sheehan's syndrome.

Overview of Management - PPH is an acute life-threatening event. Immediate management will involve resuscitation of hypovolemia with insertion of two large bore intravenous cannulae, fluid administration, application of facial oxygen, and examination to determine the etiology of the hemorrhage. The specific interventions to control postpartum hemorrhage include judicious use of uterotonic agents and various mechanical and surgical methods.

Pharmacologic Management - This chapter is devoted to critical evaluation of the standard pharmacological methods available to overcome uterine atony 9the most common reason for PPH), with particular focus on agent selection based on effectiveness, safety profile, ease of administration, cost and applicability in low-resource settings.

Oxytocin and ergot preparations - Administration of oxytocin alone or combined with ergometrine is a major component of standard management of the third stage of labor. The value of oxytocin was shown in a Cochrane analysis of oxytocin given prophylactically in the third stage of labor compared to using no uterotonic agent. Use of oxytocin was associated with a significant reduction in mean blood loss and postpartum hemorrhage in treated patients, but no difference in length of the third stage [1].

Ergot preparations are associated with more side effects than oxytocin because they act systemically on smooth muscle, while oxytocin is specific for uterine smooth muscle. However, they are longer lasting than oxytocin and produce more tetanic contractions, thus they are useful in treatment of postpartum hemorrhage. The usual dose of methylergonovine is 0.2 mg intramuscularly; it should not be used in women with hypertension, history of migraine, or Raynaud's phenomenon.

The combined ergometrine-oxytocin preparation (ie, Syntometrine: 5 IU oxytocin plus 0.5 mg ergometrine) appears to be associated with a small reduction in the risk of postpartum hemorrhage of 500 to 1000 ml, but an increase in side effects (vomiting, hypertension), when compared to oxytocin alone [2]. For both drugs, the risk of hemorrhage >1000 ml is the same.

The optimum timing of oxytocin administration is unclear. It has been given before placental separation to expedite the process and after placental expulsion to enhance contraction of the uterus and reduce the volume of blood loss. Most of the randomized trials discussed above administered the drug prior to placental separation; there are fewer data on administration after placental expulsion. A trial comparing the two regimens included 1486 women randomly assigned to oxytocin administration (20 IU in 500 ml of normal saline) upon delivery of the anterior shoulder or to administration after delivery of the placenta. Placenta was delivered by controlled cord traction in all. There were no significant differences in blood loss or retained placenta between groups [3].

Oxytocin is usually given as IV infusion (10 to 40 IU in 1000 ml crystalloid). Other options include injection of 20 IU into the umbilical vein or intramuscular administration of up to 10 IU. Intravenous bolus (1 to 10 IU) has also been used, but experience is limited [4, 5]. Intravascular infusion was evaluated in a study that randomly assigned women in the third stage to receive 20 IU of oxytocin intravenously or into the umbilical vein. There was no significant difference in blood loss between the two groups, nor was there a difference in the duration of the third stage. However, an increased incidence of feto-maternal transfusion, as measured by maternal serum alpha-fetoprotein levels, was observed in the intra-umbilical injection group [6]. Overall, bolus injection is preferable to slow infusion and that drug administration should begin at delivery of the anterior shoulder.

Prostaglandins - Prostaglandins have potent uterotonic effects, but have not been useful in active management of the third stage of labor [7]. Two Cochrane reviews found that neither intramuscular prostaglandins [8] nor misoprostol (oral or rectal) [9] given prophylactically was preferable to conventional injectable uterotonics (eg, oxytocin, ergometrine) for third stage labor management, although prostaglandins could be useful in treatment of intractable postpartum hemorrhage.

Dinoprostone (PGE2) 20 mg suppository every 2 hours vaginally or rectally is a suitable alternative. The use of intra-muscular and intra-myometrial prostaglandin (carboprost) has been advocated with some degree of success if routine oxytocin doses fail to achieve a well-contracted uterus. Intra-myometrial injections administered at 0.25-mg doses repeated at 15-minute intervals (maximum of 8 doses) are recommended [9]

Compared to injectable uterotonics, use of misoprostol was associated with a higher risk of blood loss >1000 ml (relative risk 1.36), a greater need for additional uterotonics (required in up to 16% of patients), and more side effects [10]. Shivering occurred in 19 to 28% of women given misoprostol and was dose related, but in only 6 to 13% of those given injectable uterotonics. In addition, approximately 5 % of women given misoprostol (600 mcg) developed diarrhea and 10 % developed pyrexia within 12 hours of drug administration. Misoprostol is the only thermostable uterotonic agent, thus providing an advantage in developing countries where refrigeration of drugs may pose a problem.

Stepwise Doses - The initial procedures to follow upon diagnosis of excessive vaginal bleeding are: Begin fundal massage. Ensure intravenous access, preferably with a large bore catheter. Administer uterotonic drugs such as:

i. Oxytocin 10 to 40 U in 1 liter of normal saline

ii. Methergine 0.2 mg intramuscularly (never intravenously)

iii. Carboprost tromethamine 250 mcg IM every 15 to 90 minutes, as needed, to a total dose of 2 mg.

iv. Misoprostol - unlike methergine and carboprost, misoprostol can be given to women with hypertension or asthma. Various doses have been used: 800 or 1000 mcg rectally; 200 mcg orally plus 400 mcg sublingually; and 200 mcg orally plus 400 mcg sublingually plus 400 mcg rectally. Maternal temperature should be monitored closely as pyrexia 40 degrees Centigrade can occur at these doses.

Comparison of different drugs

Drug	Dose	Route Primary (Alternative)	Frequency of Dose	Comments and Contraindications
Oxytocin	10-40 units in 1000 ml of normal saline or lactated Ringer's	IV (IM, IMM)	Continuous infusion	No contraindications
Methylergonovine	0.2 mg	IM (IMM)	Every 2-4 hours	Contraindications include hypertension / toxemia
15-methyl PGF2 (Hemabate)	0.25 mg	IM (IMM)	Every 15-90 minutes, not to exceed 8 doses	Contraindications include active cardiac, pulmonary renal, or hepatic disease
Dinoprostone (Prostin E2)	20 mg	PR	Every 2 hours	Should be avoided in hypotensive patient because of vasodilation. If available, 15 m PGF2 is preferable

1. Table: Uterotonic agents and standard doses

a. Oxytocin
   1. 10 U/ IM
   2. 5 U/IV bolus
   3. 10 to 20 U/litre

b. Methyl ergometrine
   1. 250 µg / IM
   2. 125 µg/IV
   3. Repeated every 5 min as needed maximum 5 doses

c. Carboprost (15 M PGF2a)
   1. 250 µg / IM repeat every 15 min as needed maximum 8 doses

d. Misoprostol
   1. 800 µg rectally

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Management Traumatic P P H

Dr. A. C. Rawal
Ahmedabad

Definition of PPH is when the amount of bleeding from genital tract exceeds the obstetricians estimate of normal after delivery. BUT what about bleeding occurring inside the peritoneal cavity?
In traumatic PPH uterus is well contracted and retracted but still bleeding is continued from genital tract. It can be from uterus to perineum.
Incidence: one in 500 to 1000 deliveries

Presentation of romantic PPH:
* Severe bleeding called as massive haemorrhage
* Continuous bleeding
* Slow trickling
* Haematoma (bleeding inside the tissues)
* Intraperitoneal or retroperitoneal hemorrhage

Etiology:

A. Spontaneous
   * Precipitated labor
   * Grand Multipara
   * Previous uterine surgery
   * Obstructed labour
   * Previous caesarean section
   * Drug induced

B. Iatrogenic
   * Instrumental delivery (vacuum or forceps)
   * Manipulation - external version, internal version, breech extraction, shoulder dyatocia, MRP, correction of inversion
   * During LSCS - edge of incision or trauma especially with prolonged labour or placenta previa
   * Lower segment tear or broad ligament injury missed during LSCS

C. Physical Truma - Fall
   * Separation or tear of decidua particularly at lower segment of uterus.

Site of injury

Upper genital tract injury (Supra levator)
1. Upper segment uterine rupture
2. Lower segment uterine rupture or tear
3. Cervical tear or laceration
4. Vaginal vault rupture (colporrhexis)

Lower genital tract injury [infralavator]
1. vulval injuries includes clitoral tear, Paraurethiral tear, vestibular injury, avulsion of urethra, perineal tear and episiotomy extension
2. Vaginal tear or Haematoma
   Vaginal Haematoma can occur in normal delivery also. Barns have described "a glacier like movement of vaginal epithelium upon subadjuacent tissue with tearing of vessel wall. Inadequate homeostasis and clotting abnormalities.
3. Cervical, trauma

laceration or tear of cervix occurs with delivery of fetus through undilated cervix.
Injudicious use of drugs.
Cervical encirclage
Prolapsed cervix
Conglusio os externa

Diagnosis and management:

Use of ring forceps and press down uterus from above. History about delivery, suspect traumatic PPH when the uterus is well contracted and retracted or deviated to one side.

Evaluation of general condition of patient, adequate resuscitation of the patient before surgery optimizing the blood volume

haemoglobin and coagulation status. Fully inform the anesthesiologist and the operating room staff as to the nature of the case and also ask for a second surgeon for help.

Evaluation of the genital tract under anesthesia in a well equipped Operation Theater From Below upwards to find out the cause of haemorrhage and laprotomy directly depending upon clinical history and examination.

[A] Lower genital injury he

Foley catheter is must

For vulval and vaginal tear suturing use transverse mattress suture with 1/0 or 2/0 catgut on needle

Use fine sutures with 3/0 for clitoral and Paraurethiral tear

In vaginal Haematoma evacuation of Haematoma with layer closure is recommended.

Never forget the role of packing.

Cervical tear:
Suture by technique described by Professor Munrokerr and vaginal packing usually control the leading from cervical lacerations.

Upper genital tract injury:
Usually need laprotomy and surgical therapy.

Laprotomy:
Usually vertical incision is recommended [Plauche 1992]

After opening the abdomen removal of free blood and blood clots inspection of the pelvic organs to find out the cause of traumatic haemorrhage.

Traumatic injury at lower segment during caesarean section needs careful evaluation of trauma before proceeding to different surgical methods that includes bilateral uterine artery legation by O leary or Dr Rawal technique [personal communication]

Ovarian artery legation:

Cruckshenk technique:

Hypo gastric artery legation (HAL) can be effective to reduce bleeding from all sources with in the genital tract e.g. lower segment tear, cervical tear, colporrhexis, broad ligament Haematoma, bleeding from lower segment in placenta previa .

One study reported success rate of 45 %

It is recommended that do HAL first before you go for suturing of extended LSCS incision / tear, and colporrhexis as it reduce the blood flow and improves visualization of the edges so one can avoid injuries to bladder and ureters

Obstetric hysterectomy procedure (clamp, cut, drop technique- Plouche).

Subtotal hysterectomy may not be effective for controlling bleeding from lower segment, cervical / fonicial l tears. So here total hysterectomy should be done in these cases.

To conclude prevention is better than cure.

Keep all factors in mind which are high risk.

Watch the labour perfectly and have a perfect judgment of interference

Be careful about the use of utero tonic drugs.

Suspect and act promptly

Ask for help.

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Internal and External Compression in Management of PPH

Dr. M. B. Bellad
Belgaum

Post partum hemorrhage (PPH) is one of the five main causes of maternal death in developing and developed countries.1 Uterine atony is responsible for 75-90% of primary post partum hemorrhage. 2 Successful management of post partum hemorrhage is still an enigma even to well experienced obstetrician.

Birth attendant is faced with this complication many times unanticipated (as 60 % of PPH occur in women without any risk factors), 3 hence the techniques of internal compression (uterine tamponade) and external compression (i.e. by compression sutures) play an important role in controlling atonic post partum hemorrhage in the hospital and at times to maintain hemodynamics of bleeding women to reach referral hospital from periphery.

Internal compression:

This can be applied by two ways

1. Traditional packing: In this about 8-10 meters of sterilized gauze is used to pack the uterine cavity from fundus of the uterus to the cervix and total vaginal packing. This procedure has been shown with varied success. 4,5,6 This can be used before the woman is shifted from periphery to hospital and in the hospital when faced with intractable PPH (failure to respond to oxytocics) to arrest the blood loss as a therapeutic measure or at times till preparations are made for surgical management. When used as therapy it needs strict monitoring of vitals as the bleeding may concealed. This procedure is resurging with proper antibiotic cover.

2. By using distended condom : Where in a simple rubber catheter is put into condom and it is doubly tied with a thread and is passed into the uterine cavity and a tight pack is applied in the vagina with gauze and the condom is inflated with fluid by connecting the catheter to the drips set. This causes uterine tamponade and thus arrests bleeding. The success from this was reported from Bangladesh.7 (Figs.1,2,3&4)

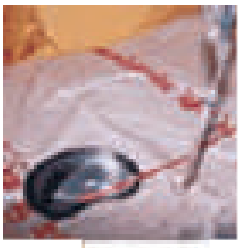

Fig-1

Fig-2

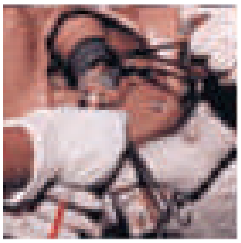

Fig-3

Fig-4

3. External compression: Once the intractable PPH (Failure to arrest the bleeding with medications) is noted, arrangements must be made for surgical intervention.

Different uterine compression sutures have been described to control intractable PPH namely, B-Lynch brace suture, Hayman Uterine compression suture and Cho multiple square sutures.8,9,10 B-Lynch technique is of importance as it is simple, inexpensive and can be done quickly. It is associated with good success and can be tested immediately before and after its performance. This is evident by more than 1000 procedures done worldwide so far11.

Hayman uterine compression suture (Fig 6) can be done quickly (as it does not need open lower uterine segment). Cho multiple square suture technique (Fig 7) used to compress anterior to posterior uterine walls. Both (Hayman uterine compression suture and Cho multiple square suture technique) are relatively new, worldwide feedback data about safety, efficacy and subsequent fertility are still limited. 9,10, 11

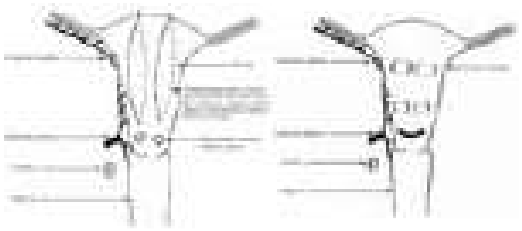

Fig-6 Fig-7

Bimanual uterine compression: the technique consists of massage of the posterior aspect of the uterus with the abdominal hand and massage through the vagina of the anterior uterine aspect with the other fist. This procedure controls most hemorrhage12.

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CONSERVATIVE SURGICAL APPROACH : PPH

Prof. C. N. Purandare
Dr. (Mrs.) Madhuri A. Patel
Dr. Nikhil Purandare

Postpartum haemorrhage is a serious life threatening obstetric problem.

Although risk factors for PPH are known, it is not always possible to successfully prevent it[1]. Therefore, rapid recognization and diagnosis of PPH is essential to successful management. But since last decade conservative surgical procedures have been successfully used in various circumstances and forms. Conservative surgical approach not only controls PPH but also preserves the woman's reproductive functions and avoids hysterectomy and its related complications and consequences[2]. The determining factor as to which method is to be used usually will depend upon the experience of the surgeon.

Conservative surgical approach in management of PPH includes

1. Uterine and ovarian arteries ligation
2. B-Lynch suture (Brace suture)
3. Internal iliac (hypogastric) artery ligation

STEP WISE DE-VASCULARIZATION OF THE UTERUS

Step wise de-vascularization of the uterus in the management of PPH has been described in a report from Egypt8. The steps are

a. Unilateral uterine artery ligation
b. Bilateral uterine artery ligation (at the upper part of the lower uterine segment)
c. Low uterine vessel ligation after mobilization of the bladder.
d. Unilateral ovarian vessel ligation
e. Bilateral ovarian vessel ligation

Myometrium is included in the ligatures in steps a to c. Steps a and b were effective in over 80% of cases[3]. In 1997, James Drife reported normal menstruation and pregnancy following this technique[4].

UTERINE ARTERY LIGATION:

The objective of ligation of the uterine arteries is to decrease blood flow to the uterus as about 90% of the uterine blood supply in pregnancy comes from these vessels. After passing over the ureter, the uterine artery divides at the level of the internal cervical os (isthmus) into a main ascending and a smaller cervicovaginal branch.

One of the largest retrospective series on uterine artery ligation for the period of 30 years, was published by O'Leary in 1995 who reported only ten failures in 265 patients[10].

After ligation of the uterine arteries if bleeding is not controlled, then the next step is to ligate the ovarian arteries.

OVARIAN ARTERY LIGATION:

Ovarian artery arises directly from the aorta and ultimately anastomoses with the uterine artery in the region of the uterine aspect of the uteroovarian ligament. Blood flow to the uterus by these vessels may increase following uterine artery ligation. Identify the ovarian artery just below the fallopian tube where it enters the mesovarium A suture should be placed carefully around the ovarian artery through an avascular window in the mesovarium taking care not to involve the fallopian tube in the suture. If it is not possible to identify the ovarian artery clearly then tie off the whole infundibulopelvic ligament. Procedure is repeated on the other side.

VAGINAL UTERINE ARTERY LIGATION

Vaginal uterine artery ligation in management of PPH following vaginal delivery has been suggested by many obstetricians. (Fig. 1). This offers a novel simple, effective and minimally invasive technique for treating intractable PPH.

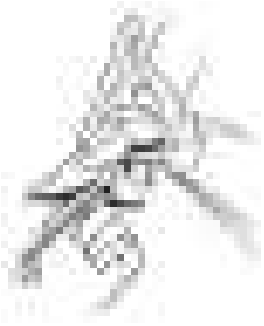


Fig. 1 : Vaginal uterine artery ligation

B-LYNCH SUTURE (BRACE SUTURE) :

B-Lynch suture, also known as the 'Brace suture' was described by Christopher B-Lynch et al in 1997 as an alternative surgical method of controlling postpartum haemorrhage due to uterine atony[6].

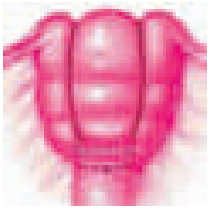
This has made significant impact on the conservative surgical management in massive PPH. The B-Lynch suture controls atonic PPH by providing an effective compression of the placental bed. This method is simple, effective and relatively safe life saving procedure which can be applied with minimal expertise. Worldwide, there are now more than 1300 successful application of the technique[7]. Other similar or modified technique such as Cho's square suture[8] and Hayman's modification of the B Lynch suture[9] techniques have been introduced adding to more available methods of conservative surgery.

Technique of B-Lynch suture

(We use chormic catgut No. 2.)

1. Suture in left lower edge of the uterine incision
2. Suture at left upper edge of the uterine incision
3. Suture passed above the fundus
4. Suture at the posterior wall of the uterus
5. Suture back through the posterior wall into the uterine cavity

6. Suture through right of uterine cavity to posterior wall
7. Suture at the right posterior wall of the uterus
8. Suture at the right anterior wall of the uterus
9. Suture at the right upper edge of the incision into the uterine cavity
10. Suture at the right lower edge of the incision through uterine cavity



11. Tied B-Lynch suture
12. Closure of the transverse uterine incision

INTERNAL ILIAC ARTERY LIGATION :

Experiments in the 1960s by Burchell ascertained that the effect of ligation of the internal iliac was to convert the affected pelvic circulation to a venous system, thereby allowing clotting to develop and persist[10]. Thus internal iliac (hypogastric) artery ligation is a simple method for controlling postpartum hemorrhage[10] with the ligature positioned directly below the bifurcation of the common iliac arteries. Only 42% of ligations are successful, probably because of the abundant collateral blood supply of the uterus from the contralateral and iliac vessels[11]. The method appears effective for uterine atony and midline perforation, but less so for placenta accreta, and of no use at all for uterine lacerations[10]. The immediate risk is inadvertent injury to the adjacent dorsally located common iliac vein. Other side effects are central pelvic ischemia resulting into breakdown of the perineal skin and postischemic lower motor neurons damage[10] and ureteric lesions. However, normal menstruation and pregnancies after such procedures have been described[5].

COMPLICATIONS :

Complications include pelvic haemotoma, sepsis, sterility, uterine perforation and uterine synechiae. Ultrasound of the kidneys following complicated emergency pelvic surgery is done to exclude ureteric obstruction.

CONCLUSION :

Conservative surgical approach in management of PPH is effective, preserves fertility and prevents hysterectomy's complications and consequences. As an obstetrician, one should expertise these methods so as and when need arises it can be performed timely which can tremendously reduce maternal mortality and morbidity due to Postpartum hemorrhage.

ACKNOWLEDGMENT :

Dr. Khyati Arvind Patel

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Role of **Embolization & Hysterectomy in PPH**

Dr. A. Kurian Joseph
Chennai

Despite all the progress in modern medicine there still deaths due to PPH. The reasons are many and several methods are being used to try and control the problem. In this short article I wish to review the role of 1) Embolization and 2) Hysterectomy in the management of PPH.

Embolization - This is a relatively new technique which requires the help of a trained interventional radiologist and a good fluoroscopy setup.

Indications - When the routine medical and conservative methods of bleeding control have been tried and not found effective then the options available are surgery with occlusion of blood flow to the uterus or hysterectomy. In this situation if facilities are available the use of Embolization is indicated as it offers 1) a conservative approach - no surgery and no organ removal 2) offers a very high success rate. When Embolization is successful then the patient dramatically recovers without any further surgery.

Where to do? Ideally the procedure is done in a radiology / catheterization lab. However if the patients condition warrants it may have to be done in the operating room with fluoroscopy. Here a balloon catheter introduced can be inflated to temporarily occlude the uterine arteries, the patient stabilized and then shifted to the ideal setting for Embolization. The logistic problem of having round the clock availability of facilities exists even in developed countries.

Anatomy - The anatomy of the internal iliac artery should first be understood - the common iliac divides at the level of the pelvic brim into the internal and external iliac arteries. The internal iliac divides soon into a posterior branch also referred to as the superior gluteal trunk. The anterior branch divides into a series of branches - the cystic uterine, obturator, internal pudendal, inferior gluteal and vaginal artery, Here lies the problem in that these vessels in around 30% of the cases may arise from other branches. The uterine artery however is identified by its very tortuous appearance.

Pre procedure assessment The coagulation profile is done to show the pre procedure status. The consent of the patient or from her relative must be obtained. The patient is ideally kept starving as further procedures may be needed. Embolization may be carried out with sedation or anesthesia. Premedication with an opiate and Promethazine would be ideal.

Procedure -The catheterization is carried out usually through the femorals with both sides being occluded through a single puncture. The catheters - several types available, are ideally small smooth hydrophilic ones, enough to not produce vascular spasm. Initially an arteriogram is taken to visualize the arterial arcade. The catheter is introduced to the uterine artery and the vessel is occluded. However if in the arteriogram extravasation of blood is seen from another branch then selective angiography must be done and the vessel identified and occluded. Bleeding from tears in the lower cervix and vagina can be treated effectively by occluding the vaginal artery.

Technique of occlusion - The occlusion is carried out by injecting particles through the internal iliac artery. Gelatin particles or pieces of gel foam offer a temporary blockade. The gelatin gradually disintegrates and the vessel gets recanalized. The use of polyvinyl alcohol particles is however permanent. No study has proved one to be better than the other as even in the permanent method the collaterals make up for the occluded vessels.

Once the vessels are occluded the angiogram is repeated to verify the absence of blood flow into the uterine arteries. The general condition of the patient is then reassessed and if there is improvement then monitoring continued. If there is no improvement then other options must be examined after reviewing the cause of the bleeding

Problems - Hematoma at catheterization site, technical difficulty in accessing the uterine arteries, infection, sciatica if the inferior gluteal artery is occluded, uterine ischemia requiring hysterectomy, ischemia of the lower limb due to intra arterial thrombosis, and radiation hazards. The amount of radiation to the ovaries in a case of Embolization has been assessed and found to be 22 to 66 cGy. Though this is higher than the irradiation at small procedures like HSG yet it is much lower than the doses used for irradiation of malignancy. The long term effects on the ovarian function are limited. The results of fertility are also good following embolization.

Effectiveness - studies report a success rate of 75 to 100% in different series (Vedantham 1997, Ojala 2005, Porcu 2005). The number of cases studied in each series is small. Fertility following embolization has been reported by several groups with the authors of a survey (Kim 2005) concluding that it did not affect fertility.

Indian scenario - In India there is a relative non availability of well set up radiographic centres. It would a futile exercise to try and set up one for each obs & gyn service. Hence it would be ideal if the local obs & gyn societies in each town could identify such centers and coordinate with the obstetricians in the effective carrying out of embolization.

Hysterectomy - Hysterectomy in post partum women generally reflects the failure of all other methods at stopping PPH.

Incidence - 1 in 331 to 1 in 6978 deliveries. It is less than 1 in 2000 in the developed countries. In these countries however there is an increase in the numbers to to the greater incidence of placenta accreta. Acc to Kacmar 2003, there is a greater association between Cesarean and emergency hysterectomy than after normal delivery. Emergency hysterectomy is found six fold more in multiple pregnancies over singletons, in triplets and more there is a 24 fold increase.

Causes - The common causes are 1) Abnormal placentation with placenta increta, accreta and percreta. In these situations the torrential bleeding may require removal of the uterus. Placental abruption if concealed may cause extravasation of blood into the myometrium. The resultant uterus - Couvelaire uterus becomes unresponsive to oxytocics and may have to be removed. 2) Rupture uterus may result in hysterectomy if the tears are extensive and the general condition of the patient is poor. Prolonged labor preceding the rupture may also result in sepsis. Trauma to the uterus following difficult delivery, instrument delivery or extension of tears at cesarean sections may also result in a picture similar to rupture uterus. 3) Atonic PPH is the constant bugbear of the obstetricians. Sepsis and prolonged labor are the common causes of atonicity. However delayed decision making in administering the appropriate oxytocics may also cause an atonic uterus. 4) Sepsis rarely is the single cause for PPH but may be associated with the other causes. Severe postpartum sepsis with abscess formation and necrosis may require hysterectomy.

Procedure - The poor general condition necessitates the use of emergency measures. The needed consents must be obtained. General anesthesia is preferred and prophylactic antibiotics used. Enter by the quickest method - if a Cesarean had been done earlier then open out the incision. The altered anatomy in the puerperal uterus should be kept in mind. Engorged blood vessels, difficulty in locating the cervix, altered anatomy due to tears or rupture uterus and the edematous friable tissues are the problems to be anticipated.

Steps of the procedure are similar to abdominal hysterectomy but measures to quickly decrease the bleeding like occlusion of the utero ovarian ligament and the use of a tourniquet are valuable. The ovaries

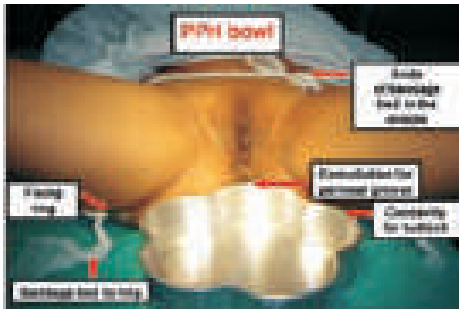
must be conserved and care must be taken to double tie pedicles to prevent reactionary bleeding. Dissect down to the cervix. Take care in mobilizing the bladder as it may tear due to adhesions & edema. Repair any bladder injury identified. If the cervix cannot be identified then subtotal hysterectomy may be adequate if the tears do not extend down. Use a indwelling bladder drain and a suction drain when needed.

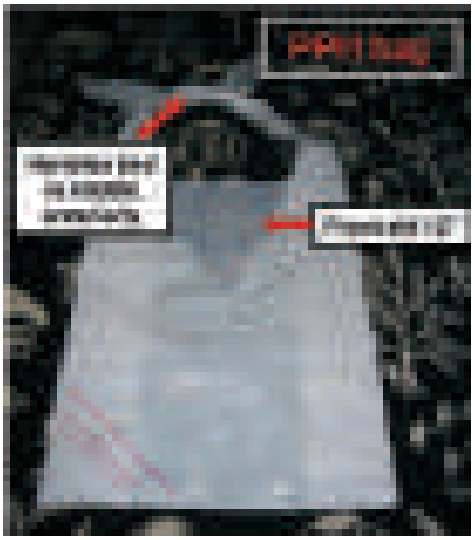
Post Op Counseling - Record the indications for the procedure along with the detailed steps of the procedure and have a detailed discussion with the patient when she recovers. Patients require a lot of support to recover from the surgery. Occasionally when the procedure has to done on a primigravid there could be severe postnatal symptoms requiring counseling.

Results - The results of an emergency hysterectomy vary from place to place based on the level of the support services. A maternal mortality rate of 30% is quoted in several studies (Ozumba 1991). The survivors also come under the group of severe acute maternal morbidity (SAMM) with varied problems like anesthesia problems, urinary tract complications, severe post natal depression etc.

In conclusion hysterectomy is a last option and emphasis must be laid on the prompt judicious use of the measures at PPH control. Yet timely use can be life saving.

Simple blood collecting implements for third stage of labour and PPH





Dr. A K. Debda
Jamshedpur

PPH bag

It is an ingeniously modified ordinary thin (20 microns) plastic bag of 24"X16" size with self handle (i e handle made from the same plastic sheet) as is commonly used by shop keepers and vendors and is widely available commercially.

How one can modify an ordinary plastic bag to make a PPH hag One has to do the following two simple things -

a) Slit one of the walls of the bag in the midline for a distance of 12" (as shown in figure 1 & 2).This will create a kV" shaped gap on the wall of the bag. This gap is meant to face the vulva to receive all the blood coming out of the vagina. It also helps slipping of the bag under the buttock of the patient high up upto her waist.

b) Next, cut both the handles of the bag from their anterior origin next to the midline slit just made, This doubles the length of the handle because the handle still remains attached to the posterior wall of the bag (see Fig), These elongated handles are to be swung round the waist of the patient and are to be tied together anteriorly (see Fig. 1 & 2) at about the level of the umbilicus above the uterine, fundus

This serves two very important purposes, i) It ensures that the bag clings to the body of the patient so that no blood can trickle up to the back of the patient and ii)secondly, as the bag is fixed high up, it ensures that all blood gravitates down to the bag proper

Facility for measurement of blood loss

The right lower corner of the bag is calibrated at 200, 300 and 500 ml volume of blood just like the urine collection bag which gives instant measurement.

Merits of PPH hag.

It is cheap, easy to use and very efficient in collecting blood. It

is disposable so no fear of transmission of infection. It is ideal for hospital set up specially because, in addition to blood and blood clots, all other material that issues from any patient e g gauze, cotton, suture material etc automatically accumulates in it and can be' disposed neatly en mass in the same pack.

The picture of this PPH bag is available at this WHO website - http://wwvv.soiutionexchange-un.net.in/health/cr/res 14060602.jpg

PPH bowl

It is a specially designed receptacle with a central convexity to fit in the perineal groove and two lateral concavities to fit in the bulge of the buttocks (see Fig 3). Two rings are fitted at the two lateral ends of the receptacle. To each of these rings are to be tied 18" lengths of bandage. These pieces of bandages are to be swung round the waist of the patient and tied in the midline anteriorly suprapubically. On doing this, the bowl gets fixed to the perineum.

This fixation serves two purposes a) it ensures that all the blood that issues from

the vagina goes neatly into the bowl with minimal spillage on the bed and it also

b) prevents displacement of the bowl due to movement of the patient which is inevitable.

The bowl is calibrated from 200 ml to 1000 ml for the purpose of assessment of the amount of loss.

This is a reusable implement so it works out cheaper.

This bowl is particularly good for home delivery. However, since in villages

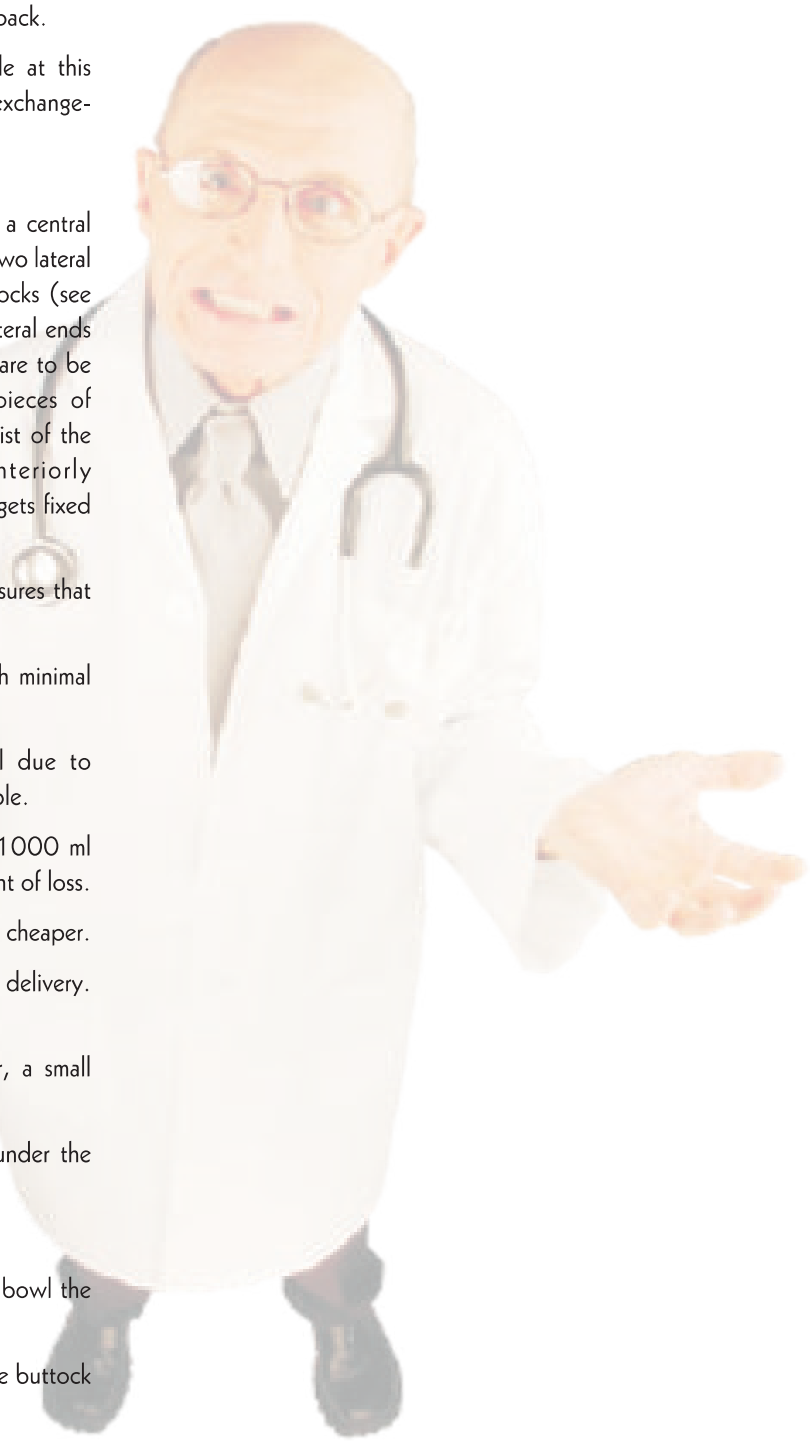
deliveries are usually conducted on floor, a small pillow or even a small bundle of

hay put in a plastic bag has to be put under the buttock of the patient for its

effective functioning.

Note- In the new modified model of this bowl the base-plate extends superiorly

for a distance of 12" which goes under the buttock of the patient.



Blood and Blood Component Therapy for PPH

Dr. Kanan Yelikar
Aurangabad

Restoration of the circulating blood volume and reperfusion of ischemic organs is an essential priority and needs to be accomplished within 6 hrs of developing hypovolumia if inflammatory sequele is to be avoided .Intravenous fluids must be infused as rapidly as possible until the pulse rate begins to decline.

The volume infused should be titrated against clinical parameters like
Blood pressure
Peripheral capillary filling
Urinary output
Central venous pressure
In the intensive units other indices like oxygen delivery and consumption indices, mixed oxygen saturation levels may be used to optimize fluid management.

Blood transfusion

Order blood transfusions if blood loss is ongoing and thought to be in excess of 2000 ml. or if the patient's clinical status reflects developing shock despite aggressive resuscitation.

Have full crossmatched blood available for transfusion within 30 minutes. Clinicians must be aware of the capabilities of their blood bank regarding timing, type, and amount of blood products available in emergencies. Good communication with the blood transfusion service is essential, and the nature of emergency and the potential amount of blood products required must be stressed.

The risks of transfusion are well known and they include infection, transfusion reaction and development of atypical antibodies. Several other complications may be noted in large-volume transfusions. The risk of hypothermia is minimized by the use of blood warmers. Dilutional coagulopathy may be observed and is discussed below. Hyperkalemia and acidosis related to the use of stored blood are theoretical risks but are seldom clinically important if perfusion of vital organs is maintained. Monitor electrolyte and acid-base status if the situation is ongoing. Hypocalcemia due to citrate intoxication is also seldom observed (Hewitt 1998).

Regularly monitor hemostatic test results in all women who require a massive transfusion. If findings are abnormal in conjunction with ongoing bleeding or oozing from puncture sites, mucous surfaces or wounds, additional blood products are required. Infuse fresh frozen plasma (FFP), beginning with 4 U and following with additional units to normalize the coagulation test findings. Many authorities recommend the addition of 1 U of FFP for every 5 U of PRBCs for patients who require continued transfusion.

Thrombocytopenia is likely after 1.5-2 times the blood volume has been replaced. Keep the platelet count more than 50 X 109/L by using platelet transfusion. Each unit of platelets increases the platelet count by approximately 10 X 109/L. (Platelets are usually given in packs of 5-6 U.) If bleeding is continuing and the platelet count is less than 50 X 109/L, administer 10-12 U initially. If surgical intervention is necessary, maintain the platelet count at more than 80-100 X 109/L. Platelet preparations contain some RBCs, and the administration of anti-D immunoglobulin (RhoGAM, WinRho) is recommended for Rh-negative women after the crisis has passed (Atoyebi, 2000).

If coagulation test results are abnormal from the onset of PPH, strongly consider an underlying cause (eg, abruptio placenta, HELLP syndrome, fatty liver of pregnancy, intrauterine fetal demise, amniotic fluid embolus, septicemia). Take specific steps to treat the underlying cause and the hemostatic abnormality.

DIC may also develop if shock has led to marked hypoperfusion of tissues, causing damage and release of tissue thromboplastins. In such cases, laboratory test results reveal that the D-dimer levels are elevated and fibrinogen levels are very low, with a prolonged thrombin time. The management of DIG is identical to that for a patient with dilutional coagulopathy. Restoration and maintenance of circulating volume along with blood product replacement is essential.

Cryoprecipitate may be useful along with FFP because of the markedly depressed fibrinogen levels. Cryoprecipitate provides a more concentrated form of fibrinogen and other clotting factors (VIII, XIII, von Willebrand factor) and is faster to prepare in the blood bank. It is commonly given in 6- to 12-U doses and may also be helpful immediately before any surgical intervention in patients with abnormal coagulation test results. The use of heparin and antifibrinolytic therapy is not recommended in women with DIC of obstetric origin.

Fluid and Blood Component Replacement

* Whole blood vs. components, debate continues
* Maintain urine output > 30 cc/hr
* Maintain hematocrit > 30% (with acute blood loss)
* Choice of components:
  - Hemoglobin - packed red blood cells
  - Fibrinogen-cryoprecipitate
  - Other clotting factors-fresh frozen plasma
  - Platelets-platelet packs
  - Volume-lactated Ringer's solution

Risks of Blood Transfusion

HIV	1:2,135,000
Hepatitis A	1:1,000,000
Hepatitis B	1:205,000
Hepatitis C	1:276,000
HTLVI/II	1:2,993,000
Transfusion-related acute lung injury	1:5,000
Alloimmunization	0.5%

Seek the advice of a hematologist in cases of massive transfusion or coagulopathy.

Laboratory tests of coagulation should be monitored frequently and interpreted with advice from a clinical haematologist; laboratories should have in place standard operating procedures to ensure that clinical staff are contacted appropriately. Experienced laboratory staff should be empowered to issue blood components in the first instance using a locally agreed algorithm. It maybe necessary to request components before results are available, depending on the rate of bleeding and the laboratory turnaround time. Although 'formula replacement' with fresh plasma is not recommended, it has been suggested that infusion of FFP should be considered after one blood volume has been lost25. The dose should be large enough to maintain coagulation factors well above the critical level, bearing in mind that the efficacy may be reduced because of rapid consumption.21, 25

Role of Auto transfusion

* Use of cell saver to collect blood from operative field, processing and reintroducing red cells to patients.
* Not well defined in obstetrics
* Three small studies (1989,1990, 1997)
  - Removal of fetal and amniotic debris
  - Appears effective
* Largest series to date (Rebarber AJOB 1998)
  - 139 cases performed at cesarean section
  - No complications related to AFE or coagulopathies
* Use two separate suction devices
  - Amniotic fluid and red cell product
  - Increase wash volume
  - Measure clotting factors and platelets every 1 to 1.5 blood Volumes lost
* Contraindications
  - Heavy bacterial contamination
  - Malignancies

Conclusions

An early balanced transfusion therapy is vital in massively bleeding patients, and a pro-active approach from the blood bank is warranted. People have introduced an acute transfusion package (ATP) consisting of 5 RBC, 5 FFP and 2 PC units, indicated in massively bleeding patients, securing a balanced transfusion therapy.

Fighting PPH in India, Where are we?

The World Health Organization (WHO) estimates that, of the 529000 maternal deaths occurring every year, 136000 or 25.7% take place in India, where two-thirds of maternal deaths occur after delivery, postpartum hemorrhage being the most commonly reported complication and the leading cause of death. (29.6%)[1]

In India, around 70% of the population lives in villages. Out of an estimated 25 million deliveries each year, 18 million take place in peripheral areas where maternal and perinatal services are either poor or non-existent. India's stated goal is to reduce maternal mortality (MMR) from 437 deaths per 100000 live births that was recorded in 1991 to 109 by 2015.

One of the critical bottlenecks for providing more high-quality emergency obstetric care (EOC) was a serious shortage of specialist staff such as obstetricians and anesthesiologists at various levels in rural areas.

The present strategies to prevent maternal mortality in India focus on building a better and more fully functioning primary health-care system, from first referral level facilities to the community level.

In order to reduce the maternal mortality ratio dramatically, all women must have access to high-quality care at delivery. That care has three key elements :

1. A skilled attendant at delivery.
2. Access to emergency obstetric care (EOC);
3. A functional referral system.

Dr. Hema Diwakar
Bangalore

1. In addition to being properly trained for conducting routine deliveries, a second and more promising way in which skilled attendants can reduce the incidence of postpartum hemorrhage is by actively managing the third stage of labor in every delivery.[2]

2. The EOC Project in India

A project is being established to develop the capacity of general practitioners and non-specialist medical officers to provide high-quality EOC services in rural areas where skilled obstetricians are not available to prevent maternal mortality and morbidity.[3]

The Federation of Obstetrics and Gynecological Societies of India (FOGSI) has established five EOC training centers in rural India that will improve the provision of EOC services by medical officers, with the ultimate goal of reducing maternal mortality and morbidity.

Four master trainers at medical colleges and four at district level hospitals will provide the training in a uniform manner. Each training center will offer two types of courses : a short course of 3 weeks for upgrading the skills of doctors already working in rural or under-served areas but not possessing sufficient knowledge of EOC, and a long course of 16 weeks to provide comprehensive skills including training in performing a Cesarean section.

The role of FOGSI/ICOG will be, first, to coordinate with medical colleges and government hospitals to make arrangement for training, and, second, to regularly monitor the master trainers,

the training program and the quality of training centers and to formalize the end assessment and certification.

A total of 162 doctors will be trained during the pilot project of 2 years for three centers established by FOGSI, MacArthur and JHPIEGO.

The Asia Oceania Federation of Obstetrics and Gynaecology (AOFOG) has launched a program called the AOFOG PPH Initiative.[4] This program focuses on the active management of the third stage of labor in areas with skilled birth attendants and in areas where misoprostol is available but without skilled birth attendants.

United Nations guidelines recommend a minimum of one comprehensive facility and four basic EOC facilities per 500000 population.

United Nations offices in India created the Solution Exchange - a free, impartial space where professionals are welcome to share their knowledge and experience.[5] Members represent a wide range of perspectives from government, NGOs, donors, the private sector and academia.

(3)REFERRAL SYSTEMS

A helpful way to analyze the barriers to utilization is through the 'three delays model'[6] The delays leading to death can be divided into three categories :

A. Delay in deciding to seek care;
B. Delay in reaching care;
C. Delay in getting treatment at the facility.

One important element of strategies to reduce delays is the strengthening of the referral system. First and foremost is the need for referral facilities that provide 24-h 7-day-a-week care within a reasonable distance of where people live. A stated goal of many training programs for TBAs is to improve their referral of women experiencing obstetric emergencies to facilities that can manage them. Skilled birth attendants, whether based in facilities or communities should be the back-bone of the system.

An excellent network of blood banks and blood storage centers has been established in the government health institutions to ensure the supply of blood and its components (86 blood banks and 26 blood storage centers).

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Post partum hemorrhage in India: A Pubic Health perspective

Dr. Dileep V Mavalankar
Ahmedabad

Dr. Kranti Vora
Ahmedabad

In spite of major scientific achievements, about half a million mothers lose their lives every year in child birth and related conditions; out of which 136,000 (25.7%) happen in India (WHO 2000). More maternal deaths occur in India in one day than there are in all the developed countries in one month. Majority of maternal deaths are due to hemorrhage, sepsis, pregnancy induced hypertension and abortion related complications which are manageable even in low resource settings. Postpartum hemorrhage (PPH), the major cause leading to 24 percent of maternal deaths is rapid killer (average duration between onset of massive bleeding and death is estimated to be just two hours).

Even though India has made nuclear devices, majority of the childbirths still occur at home and are attended by unskilled birth attendants (dais or relatives); which at times lead to delay in recognition of complication and referral. Most of the sub-centers and primary health centers do not have the required medicines and skilled personnel for basic management of PPH and resultant hypovolemic shock. Majority of government Community Health Centers (CHC) and some of the district hospitals lack availability of blood and facility for surgical management of PPH on 24 hour basis. Although private sector is dominant and present at town level in many districts, its accessibility is beyond poor Indian mothers because of financial constraints and lack of social health insurance.

India is emerging as a leading economy in the world and global power, yet we are losing mothers to a cause, post partum hemorrhage which is not only preventable but treatable even in low resource settings. Of later government and international agencies and FOGSI are making efforts to reduce maternal deaths in India. Efforts have been made to improve EmOC and institutional deliveries, still

management of PPH and access to blood is poor. Community trials of misoprostol have proved effective in reducing risk of PPH even in home delivery settings (McCormick 2002).

We suggest the following concrete actions:

1. Training and empowering all birth attendants in active management of third stage.
2. Training and empowering birth attendants in basic management of PPH.
3. Equipping birth attendants with modern technology of mobile phones to consult with higher qualified experts and call for referral support in case of need.
4. Develop social health insurance so that even the poor and middle class can access the facilities of Private obstetricians.
5. Access to blood and life savings medicines must be ensure even in rural areas.

In conclusion, with of proper evidence based strategy of EmOC and skilled attendance at each birth, with specific focus on management of PPH, India can reduce MMR substantially in next 5-7 years. Government must involve the private sector and rural health provides to ensure that PPH is managed will even in remote areas.

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Best Practice

Guidelines for Management of PPH in Indian scenario

Prof. Alokendu Chatterjee
Calcutta

Prof. Jaydev Mukherji
Calcutta

A/Prof. Partha Mukherjee
Calcutta

Based on hospital studies, 25-30% of all maternal deaths in India is due to PPH. Figure may be higher in communities/ villages, where it occurs more often & more difficult to treat1. 50% of maternal deaths occur within 24hrs of delivery & untreated PPH patients have about 2 hrs to prevent catastrophe. So, a low-tech community based solution is required because 50% births in India are at home with rudimentary facilities & without a physician. Asian Women are unable to cope with large amount blood loss & 250ml loss may cause concern-due to small built/less blood volume, lower Hb% & undernourishment vis-a-vis Western women 2. f^ - Traditional definition of PPH if > 500 ml blood lost, post delivery may not be helpful, as effects of blood loss adversely affecting the basic parameters is more important than quantity.

Prophylaxis

Active management of 3rd stage, keystone for preventing PPH, reduces-post delivery Wood toss, prolonged 3rdstage.

PPH incidence (by 40-60%), maternal anaemia & therapeutic use of oxytocic (by 70%). But it is associated with higher risk of nausea, vomiting & raised BP (when ergot is used). Results from RCTs support using Oxytocin IM, 10 units within 1 minute of birth. Use of parenteral Oxytocin is not yet universal in much of the developing world due to poor resources, untrained birth attendants, unavailability of cold storage facilities for Injectable uterotonics (being unstable at room temperature) This situation demands oral uterotonics. Prostaglandin Misoprostol - PGE1 analogue is a strong uterotonic without causing hypertension, orally effective-detected in circulation within 2 min, thermostable, long shelf life -may be an ideal prophylactic agent in developing nations particularly in low resource setting. A landmark study - ^ from Karnataka, India, was published in October 2006 in the Lancet. Derman et al3 showed that 600 microgramme Misoprostol when administered within 5 minutes of cord damping/cutting, was associated with significant reduction of mean blood loss and PPH.(1 case of PPH prevented for every 18 women treated). It seems to be a good option in resource poor settings. Therapeutic use of Misoprostol is also promoted, particularly in resource poor settings. A systematic review by Hofmeyr et al4 concluded that Misoprostol 200 microgramme orally plus 400 microgramme sublingually significantly reduced blood loss in clinically diagnosed PPH. This ensures quick onset combined with a prolonged bioavailability. Rectal route has a slower onset but prolonged activity.

Management of PPH

Suspect	More than 500ml vaginal bleeding + tachycardia
Assess	Ut.soft, Placenta retained, Retained placental bits, Exclude Inversion, Ut.contracted, Rupture, Coagulation failure
Classify	Atonic / Traumatic
General Rx	Ask for help, if in shock-2 large bore needles, 2 litres NS/RL, Haemaccel/Gel fusin,1.5-2L, blood requisition, catheterisation, head down, face mask O2
Specific Rx	Massage+ Repair, Oxytocin 10IU, Explore & uterotonics, remove placenta/remove bits

Stepwise management

Stepwise management of PPH-a disciplined well-rehearsed drill saves lives

Step 1 Bleeding continues -
15 methyl PGF2 ? 250 microgm I.M. every 15-30 min. maximum 2 mgm, response 76% after 1st dose, overall success 95% Intra myometrial injection-faster effect

Step 2 Bimanual Compression-hand in vagina elevating uterus stretches uterine artery Compression of aorta against vertebrae-useful emergency measure for 10 minutes; time to stabilise patient & mobilise resources urgently.

Step 3 Transvagmal Options Uterine packing-reemerging option 5
There is a need for an effective temporizing intervention for use at primary level when first line measures fail & there is a need to transfer the woman to a higher-level facility. Packing & tamponade procedures could be usefully evaluated in this regard.
Specially helpful in-Placenta in LUS, Placenta Accreta. Uterine atony.

Step 4 Compression Sutures -basic technique is ridiculously simple & very cost effective
B.Lynch or its various modifications
Advantages of Compression sutures Fertility conserved-uterus involutes rapidly -tension released without damage Simplicity- even middle grade Obstetricians can perform. No damage to vital structures

Step 5 Other Surgical measures Stepwise uterine devascularisation
Unilateral uterine vessel ligation 80% effective Bilateral uterine vessel ligation,
Low bilateral uterine vessel ligation to include cervico-vaginal branch, Bilateral ovarian vessel ligation, Ligation of anterior division of internal iliac artery

Limitations of Internal Iliac artery ligation - due to extensive collateral circulation success rate is only 50%. High degree surgical skill needed (tertiary centre) Complications-
a) laceration of iliac veins b) Ureteric injuries c) long operating time (unless extra peritoneal)
Hysterectomy Quick, safe & sure Decision must be made by the senior most Doctor.

Conclusions

Best practice guidelines should include -

* Community education & training of birth attendants
* Antenatal Hb% testing & Iron supplementation
* Planning for safe delivery in advance -birth preparedness +complication readiness
* Uterotonics
* Transfer facilities
* Blood transfusion availability at FRU & prompt surgical interventions when required

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Future Training, Research & Drugs - PPH

Dr. Narendra Malhotra
Agra

Dr. Jaideep Malhotra
Agra

Post partum haemorrhage is a potentially life threatening complication of both vaginal and caesarean deliveries. PPH occurs in about 1-10% of deliveries and about 17-25% maternal deaths are due to PPH world wide, annually. The problem is in developing countries because the available effective tools for prevention and treatment of PPH are not feasible and applied practically, as many births are home deliveries with untrained birth attendants.

The crux of the problem is that prevention and treatment is available but for prompt accurate diagnosis, traning of birth attendants in rural settings is most important, also training for storage of drugs and of their correct use is paramount. A major factor is also the delay in transportation due to lack of vehicles and poor roads hence in developing countries low technology treatments need to be looked at. Also we need to pay attention to community education, emergency obstetric care, training of birth attendants and the primary health care doctors and also look at the use of newer drugs like misoprostol and newer drug delivery system like UnijectTM which have shown some promise as potential solution to this life threatening cause of maternal mortality. Training of doctors for AMTSL is very important. Newer Research drugs like Recombinant Factor VII: A new weapon to fight against haemorrhage.

Two major international programmes are efforts towards reducing maternal mortality due to haemorrhage: "The Safe Motherhood Initiative" and WHO's "Making Pregnancy Safer"[1,2]

Training Aspects

The challenges faced for training are community education for need of hospital deliveries, cultural barriers, training of birth attendants, conquering anaemia and accurate diagnosis of PPH.

(a) Need for institutional delivery home deliveries without trained birth attendants represent the biggest challenge to PPH prevention.[3]
A study in North India found that women who sought emergency care often went to a facility that could not provide appropriate service.[4]

(b) Cultural restrictions lack of education, cultural and customs and lack of women decision-making power leads to home deliveries in rural set ups.[5]

(c) Training of birth attendants 66 countries out of 224 in the WHO data do not meet the 80% of births attend by a skilled attendant.[6]

(d) Anaemia : 88% of Indian women are anaemic and 20% of maternal deaths occur in anaemic women.[7]

(e) Early and accurate diagnosis : if birth attendants are not trained for accurate blood loss assessment and for timely

reference then the damage due to delay may be irreversible.[8]

(f) FOGSI's initiative with McArthur foundation and now with Govt. of India towards training of village doctors (MBBS) in a EMOC long course for obstetric emergencies including C.S.

Potential Solutions

A multi-pronged effort has to be made to combat PPH and these may be in form of (in rural settings)

(a) Emergency care.[9]

(b) Natural remedies include many herbal, botanical and ayurvedic preparations with potential of preventing PPH double blinded studies and toxicology studies are needed for these natural remedies.[10]

(c) Breast feeding and nipple stimulation[11]

(d) Anaemia detection and correction

(e) Dietary supplementation

(f) Training of birth attendants increasing the skills for those attending deliveries is considered more effective than increasing programmes for screening high-risk cases (WHO)[12]

(g) Active management of third stage (AMTSL)[13]

(h) Uterotorics (Newer drugs)

(i) Oral misoprostol[13,14]

(ii) Uniject(15) a simple device developed by program for Appropriate Technology in Health (B.D., Franklin Lakes, NJ) deliveries one dose of oxytocic in a pre-filled sterile packet.

(i) MBBS doctors at primary health centres trained for operative obstetrics and anaesthesia.

(j) The tamponade test is a simple non-surgical method to treat PPH in low research settings devised by Prof. S. Arulkumaran. By this simple devise we can decide, in cases of uterine atony, whether uterine tamponade itself would be therapeutic or whether laparotomy is needed.

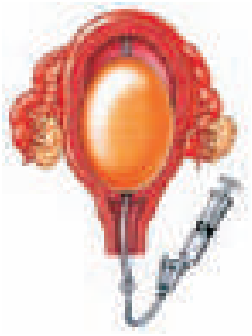

Fig. : Bakri Tamponade Balloon Catheter

(k) There is also an urgent need to have training of all ObGyn residents in surgical management of PPH. Internal iliac artery ligation and obstetrical hysterectomy and other haemostatic surgery like B lynch etc should be well demonstrated live if possible or on models.

Role of National Professional Organisations (FOGSI) FIGO has provided to all national organisations a 10 key action plan to prevent PPH and manage it when it occurs.[16]

FOGSI has to play an important role along with the Govt. of India projects for

(a) Advocacy for skilled care at birth

(b) Public education for need to prevent and treat PPH

(c) Publication of statements in journals, newsletters, websites

(d) Fight against legislative barriers, poverty and malnutrition

(e) In corporate AMTSL in National standards and guidelines.

(f) Work with policy makers, regulatory agencies, national pharmaceuticals to ensure adequate supply of utero tonics.

Conclusions

Even after so much of technological advances very few practical and affordable solutions are available today to decrease PPH related mortality and morbidity. This could be a possible

area of research specially in low resource settings in the rural developing countries.

Although AMTSL is very efficacious in reducing PPH but a possible area of research would be the individual components of AMTSL and their order of administration.

Research is also needed to see if AMTSL training can be given to TBA'S and the effectiveness this would have.

Research is also needed to have an inexpensive simple blood loss measuring method.

Research is need in pharmaceutical and technological therapy and drugs and how they can be applied to low resource settings realistically by TBA's.

A new high tech weapon has appeared on the battlefield of haemorrhage and it might just find a place in obstetric cases of post partum haemorrhage and placenta acreta-percreta.

Women are not dying because of disease we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving (Mahmood Fathalla)

Lastly but not least a serious effort has to be made towards women education and empowerment. Eradicate WEEP (Women Education & Empowerment Problems) with definitely reduce the maternal mortality.

Acknowledgements

Sincere thanks to Pharmaceutical Industries (Astra & Sandoz) for doing the literature search and to many of my colleagues for helping me write this article (specially Dr Malini K V of Bangalore) and thanks to Dr Pankaj Desai (President FOGSI) & Dr Atul Munshi (S. V. P. FOGSI) for addressing the issue of obstetric haemorrhage in the first FOGSI-FOCUS of 2007.

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PPH-Where are we heading?

Dr Shirish Patwardhan
Pune

Dr Dilip Walke
Pune

Technological advances have brought about sea of changes in every walk of our life. It has taught us to dream of a better and safe future. Can we dream of a zero mortality and morbidity in these cases in the next 20 years to come?

A lot has changed from the times when uterine massage was the only method available for control of bleeding from an atonic uterus. But many milestones are yet to be achieved.

Let us dream of PPH in the year 2027.

The striking change after 20 years would be in the infrastructure of rural hospitals & the patient. All women would have Hb of 14g%. Availability of blood, blood products, oxytocics and intensive care facility would no longer be an issue. Health care worker would be well trained in the management of PPH.

Prompt referral to tertiary units would be the rule. Each rural center would be well connected to tertiary care center by internet for any advice on the spot. A well equipped and well manned ambulance service would be available for shifting an emergency. It would not be an exaggeration to dream of airlifting of patients by helicopter service from any spot of our country.

Tertiary centers would be equipped not just for saving lives but in cases of PPH for saving the uteri. Uterine artery embolisation would become an every day affair. Though most of the cases would be managed in the radiology departments, the surgical team would be better trained in life saving surgeries like bilateral internal iliac artery ligation. Such conservative and life saving surgeries would become an essential pre-requisite for postgraduate degrees

Here is a dream case of PPH in 2027. May GOD make it come true

* 0hrs-Vaginal delivery at a rural hospital
* 0.30hrs-Severe PPH-Prostaglandins given/life support measures taken/blood products started and patient shifted to ICU(managed by rural level health care workers)
* 0.45hrs-patient airlifted to a tertiary care center
* 1 hr-Patient in the radiology department for uterine artery embolisation
* 2hrs-Patient hale and hearty!!!

Let all fellow FOGSIANS interested in the activities of Safe Motherhood Committee join hands and make this dream possible.


INTERESTING CASES

Case-1

Internal Iliac Ligation - Pros & Cons

Dr. Prakash Bhatt
Surat

I was invited in an emergency at 2-30 p.m. to examine a patient who was under anesthesia, on operation table.

She had undergone L.S.C.S at 11-00a.m. for fetal distress and according to the primary obstetrician the surgery was straight forward and without any technical difficulty. After about one hour she had registered hypotension and tachycardia. She was resuscitated with intravenous fluids without further improvement and tachycardia increased, pallor increased and hypotension accentuated. There was no abnormal vaginal bleeding. Opinion of another obstetrician was sought and he suspected internal hemorrhage. An urgent bed side ultra sound revealed a right parametrial hematoma. Urgent exploration was decided. Blood transfusion was arranged.

Exploration was carried out. A huge hematoma was detected extending from ovarian ligament to bladder reflection caudally and upto lateral vaginal wall on right side. He opened the broad ligament and was met with severe bleeding from lateral pelvic wall amongst blood clots and old liquefied blood. He applied a tight pack, resuscitation was continued with blood transfusion and inotropic drug - Dopamine and Dobutamine.

When I reached, patient had no peripheral pulse, no recordable blood pressure and her urine output for last 2 hours was nil. On exploration, there were only aortic pulsations palpable.

It was obvious that uterine artery was torn and had retracted. The anatomy was completely disturbed. There was a rent in the lateral wall extending into the cervix. It was decided to ligate ipsilateral anterior division of Internal ilac or internal iliac vessels completely.

Aorta was traced to common ilac vessels and then onwards to bifurcation of common iliac. Internal iliac artery was identified from bifurcation. It was not possible to ascertain the vessels for certain because pulsations from common iliac vessels down were not present. Presumed internal iliac artery was separated with fingers from surrounding hematoma and loose connective tissues. A bull dog clamp was applied and tight pack was applied to the lateral pelvic wall. Meanwhile vigorous resuscitation efforts were going on.

After 7 minutes the pack was removed and to our sheer delight and surprise the pulsation of internal and external iliac vessels returned, confirming the correct application of clamp. Formal ligation of the internal iliac artery was a matter of 3 minutes when bull dog clamp was released and hemostasis was confirmed. The blood clots and other debris were flushed out with asepto syringe with guarded pressure. The torn edges of uterus were identified right upto lower angle and sutured, after identifying the course of ureter.

The resuscitative measures ultimately found the response and by the time abdomen was closed, peripheral pulse had returned and urinary excretion had just started.

Patient was monitored closely and recovered well.

Discussion: Though it has been widely held that even bilateral ligation of internal iliac vessels has not been accompanied with any vascular complications due to abundant anastomosis, there are few reports of severe neuro vascular complications reported in literature.

(1) Peripheral nerve ischaemia after internal iliac artery ligation

Ligation of the internal iliac (hypogastric) arteries has been used to control serious obstetric and pelvic bleeding. It is generally well tolerated in the young obstetric or gynaecological patient, presumably because of an extensive collateral blood supply.1-3 Acute lumbosacral plexopathies have been described, however, in older patients with vascular disease when the internal iliac arteries are interrupted.4-8 We report on a teenage patient with similar peripheral nerve ischaemia after bilateral internal iliac artery ligation for postpartum haemorrhage.

R K SHIN, M M STECKER

Department of Neurology, Hospital of the University of Pennsylvania, 3400 Spruce Street, Philadelphia, PA 19104-4283, USA

(2)Vesical and gluteal necrosis after bilateral internal iliac ligation

Abdominoperineal resection with pelvic sidewall dissection is not uncommonly performed for treatment of bulky primary or locally recurrent rectal neoplasms. Usually, the internal iliac arteries and veins are ligated bilaterally early in the course of the procedure to reduce intraoperative blood loss and to facilitate subsequent dissection of the pelvic sidewalls. No complications related to bilateral internal iliac artery ligation in this setting have been described previously. In this report, profound vesical and perineal necrosis after bilateral internal iliac artery ligation occurred in a female patient operated on for recurrent rectal cancer. If the internal iliac artery is ligated below the take-off of the gluteal vessels, perineal necrosis can be prevented.

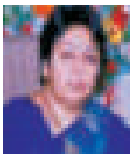
PMID: 3971826 [PubMed - indexed for MEDLINE]

Andriole GL, Sugarbaker PH.

Department of Neurology, Hospital of the University of Pennsylvania, 3400 Spruce Street, Philadelphia, PA 19104-4283, USA Perineal and bladder necrosis following bilateral internal iliac artery ligation.

Case-2

Blood Disorder leading to PPH

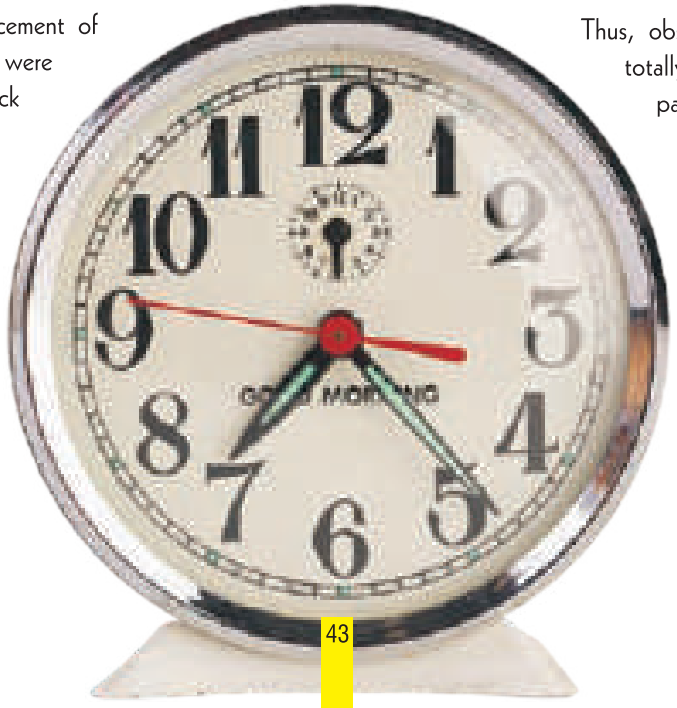


Dr. Meera Desai
Vadodara

Mrs. J. G 24 years G1 P0 had an uneventful C.S for CPD. For six hours postpartum she was well settled, vitals were normal and uterus was firm well-contracted. Thenafter she started profuse bleeding per vaginum, dark altered blood. Uterus was firm well contracted and there was no question of any tears - vaginal or cervical as the head never went beyond the brim. However fearing the unknown a local examination was done which too confirmed bleeding from the os and no tears or lacerations.

Ultrasonography was done which ruled out any pelvic collection. Measures to combat bleeding were quickly instituted. But soon her abdominal dressing also got soaked and there was echymoses at vene-puncture points. This clinically gave a full blown picture of consumptive coagulopathy without any known antecedent obstetric cause like PIH, accidental hemorrhage, etc. Laboratory investigations also revealed deranged bleeding profile. Though unable to pinpoint what caused the coagulation failure, replacement of blood and components were done. She went in to shock but was resuscitated. Exploring the abdomen was obviously never considered. Soon after 10 hours, her bleeding stopped and after 72 hours her laboratory parameter came to normal. Thenafter she had a near uneventful outcome except for a wound disruption due to hematoma.

DISCUSSION: After extensive discussion with peers all over the country and searching for references, rational explanation came forward. Following any labour a small amount of thromboplastin is always released into circulation. However the maternal compensatory mechanism is so robust that if efficiently and quickly overwhelms this thromboplastin. However, very rarely in some mothers this neutralization may not occur and she may develop a picture of consumptive coagulopathy. In the case under scrutiny though Phase II of Amniotic Fluid Embolism (AFE) was considered, phase I being subclinical. However this too was subsequently ruled out as Clark's Registry clearly states that AFE can't occur as late as six hours after delivery process.



Thus, obstetricians can be caught totally unawares at times with patients presenting as PPH to which there is no easy explanation but could warrant a deep rare cause like this or others like leukemia or Bernard Souliver Syndrome (where platelet adhesiveness is a problem).

SOME HARD FACTS ABOUT PPH

- 11% of Live Births-Severe PPH.
- 14 Million/Year Globally.
- 3.9% of Vaginal Deliveries.
  6.4% of C.S.
- 1.4 Million Women die yearly.
- 15/25% Maternal Death in India-Due to PPH.
- 12% Severe Anaemia-Post Delivery.
- About 10% Obstetric Hysterectomy due to PPH.
- Increased Obstetrics care decreases PPH related problems.
  (In U.K.-only one death out of 271 from PPH 0.35%!!)
- Blood Component therapy is better than whole blood.
- Awarness, Information & Training in surgical management is LIFE SAVING!

PPH at a Glance

Stage	Aproximately Blood loss (ml)	Volume loss %	Signs & Symptoms
0(normal loss)	<500	<10	none
	ALERT LINE		
1	500-1000	15	minimal
	ACTION LINE		
2	1200-1500	20-25	↓urine output ↑pulse rate ↑respiratory rate postural hypotension narrow pulse pressure
3	1800-2100	30-35	hypotension tachycardia cold clammy techypnea
4	>2400	>40	profound shock

Stagewise Management

1 = Need observation ± replacement therapy

2 = Replacement therapy and oxytocics

3 = Urgent active management

4 = Critical active management (50%mortality if not managed actively)

Proposed Clinical and Prognostic Classicfication

Adepted from text book of PPH by B-Lynch et al 2006 and Benedetti T. pocket book on obstetrics 2002.

This

Fogsifocus

is dedicated

to millions of women

who suffered sequel of PPH

with a determination to go...

for **ALL OUT EFFORTS**

towards

Prevention.