POSTPARTUM HEMORRHAGE AND THE B-LYNCH TECHNIQUE

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Postpartum hemorrhage and mortality

- Worldwide over 125,000 women die of PPH every year; hence it is a significant cause of maternal morbidity and mortality both in developed as well as developing countries.

- In the recent triennial confidential enquiry into maternal deaths in UK (2003-2005), PPH remained one of the top 3 causes of direct maternal deaths.

- Atonic uterus accounts for 75-90% of primary PPH.
Postpartum Hemorrhage

- Blood loss: > 500 ml at vaginal delivery
  > 1000 ml at Cesarean

- ACOG: 10% drop in hematocrit
  Need for blood transfusion

- Severe PPH: > 1000 ml loss at vaginal delivery

- Any amount of blood loss causes S/O Hypovolemic Hemorrhagic Shock
  - Tachycardia
  - Hypotension
  - Reduced urine output
## Causes of PPH

<table>
<thead>
<tr>
<th>Four Ts</th>
<th>Cause</th>
<th>Approximate incidence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tone</td>
<td>Atonic uterus</td>
<td>70</td>
</tr>
<tr>
<td>Trauma</td>
<td>Lacerations, hematomas, inversion, rupture</td>
<td>20</td>
</tr>
<tr>
<td>Tissue</td>
<td>Retained tissue, invasive placenta</td>
<td>10</td>
</tr>
<tr>
<td>Thrombin</td>
<td>Coagulopathies</td>
<td>1</td>
</tr>
</tbody>
</table>
Traumatic PPH: Predisposing factors

- Previous cesarean section (or other surgery)
- Obstructed labor
- Instrumental delivery
Traumatic PPH

- 20% of all PPH
- Operative vaginal delivery
- Prior uterine surgery
- Obstructed labor
- Grand multiparity
- Injudicious use of oxytocics
Retained placental tissue

- 5-10% of all PPH
- Adherent placenta
- Mismanaged 3rd stage
- Succenturiate placenta
Coagulation disorders

- Abruptio placentae
- HELLP syndrome
- Jaundice
Postpartum Hemorrhage: Risk factors

- Prolonged 3\textsuperscript{rd} stage of labor
- Fibroids, placenta previa
- Previous PPH
- Overdistended uterus
- Episiotomy
- Use of magnesium sulfate, preeclampsia
- Induction or augmentation of labor

Not necessarily useful clinically as only about 10% of women with any of these risk factors develop atony and many without risk factors develop atony.
The traditional management begins with conservative methods like bimanual uterine compression, use of uterotonics, uterine tamponade with balloons, rarely arterial embolisation, the failure of which mandates surgical intervention.

Internal iliac artery ligation requires skill and practice and when all these measures fail hysterectomy is the last resort.
Management of PPH

- Prevention
- Identification of risk factors
Swift execution of a sequence of interventions with prompt assessment of response

Initial steps

- Fundal massage
- ABCs, O2, IV access with 16g catheters
  - Infuse crystalloid; transfuse blood products as needed
- Examine genital tract, inspect placenta, observe clotting
- Give uterotonic drugs
  - Oxytocin 20 IU per L of NS
  - Carboprost (Hemabate) 250mcg IM q15-90min up to 2mg
  - Methylergonovine (Methergine) 0.2mg IM q2-4h
  - Misoprostol 800 or 1000mg PR
# Uterotonic agents for PPH

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Freq</th>
<th>Side Effects</th>
<th>Contraind.</th>
<th>Store</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin (Pitocin) 10 units/ml</td>
<td>Dilute 20-40 units in 1 L NS 10 IU IM</td>
<td>IV IM</td>
<td>Continuous Infusion, 250 ml/hr</td>
<td>Nausea, vomiting Water intox with prolonged IV use</td>
<td>Hypersensitivity to the drug</td>
<td>Room temp</td>
</tr>
<tr>
<td>Carboprost (Hemabate) 15-methyl PG F2a 0.25 mg/ml</td>
<td>0.25 mg</td>
<td>IM IMM</td>
<td>Q 15-90 min not to exceed 8 doses</td>
<td>Nausea, vomiting Diarrhea Fever/Chills HA Hypertension Bronchoconstriction</td>
<td>Hypersensitivity to the drug Use with caution in patients with HTN or asthma</td>
<td>Refrig</td>
</tr>
<tr>
<td>Methylergon-ovine (Methergine) 0.2 mg/ml</td>
<td>0.2 mg</td>
<td>IM</td>
<td>Q 10 min x 2 Q 2 – 4 hrs</td>
<td>Nausea, vomiting Hypertension, esp in pts with PIH or chronic HTN Hypotension</td>
<td>Hypertension Preeclampsia Hypersensitivity to the drug</td>
<td>Refrig Protect from light</td>
</tr>
<tr>
<td>Misoprostol (Cytotec) 100 and 200 mcg tabs</td>
<td>600-1000 mcg</td>
<td>PR</td>
<td>Single dose</td>
<td>Nausea, vomiting Shivering Fever Diarrhea</td>
<td>Hypersensitivity to the drug</td>
<td>Room temp</td>
</tr>
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</table>
Management

- **Secondary steps**
  - Will likely require regional/general anesthesia
  - Evaluate vagina and cervix for lacerations
  - Manually explore uterus

- **Treatment options**
  - Repair lacerations with running locked #0 absorbable suture
  - Tamponade
  - Arterial embolization
  - Laparotomy
    - uterine vessel ligation
    - B-Lynch suture
  - Hysterectomy
Atonic PPH: Operative management

- Uterine artery ligation
- Internal iliac artery ligation
- Brace stitch-B-Lynch suture
- Hysterectomy
- Uterine packing
- Embolisation of vessels
In 1997 Christopher B Lynch devised an innovative technique to treat uterine atony where a continuous suture was used to envelope and mechanically compress the uterus in an attempt to avoid hysterectomy.

Since then this technique has been widely used around the world. Later Dr Hayman and Prof. Arulkumaran modified this procedure of B Lynch suture independently.

Here there is no need to open the uterine cavity and the suture on straight needle is used to transfix uterus from front to back just above reflection of bladder and tied at fundus of uterus.
Christopher Balogun-Lynch

- In 1997 he published a description of the B-Lynch brace suture for post partum hemorrhage.
Other compression sutures

Hayman Uterine Suture

Cho’s Multiple Square Suture

Global Stitch  By  Dr. Gunasheela Bangalore
Basic method

- Symmetrical anchoring on uterus
- Vicryl (Cat gut) 1 or 2
- No slipage of stitch
- Modest symmetrical compression
- No uneven compression
- No risk of gangrene of uterus
- Mechanical stimulation
Anterior and posterior views of the uterus

Anterior view of uterus showing modified B-Lynch Technique

Posterior view of uterus showing modified B-Lynch Technique
Placenta previa and placenta accreta

- Although uterine atony is the indication for use of modified B-Lynch suture, but it has been shown in many case reports that this suture is also useful in controlling bleeding in cases of placenta previa and placenta accreta.

- It has also been used in controlling massive bleeding after mid trimester miscarriages. It has been used in patients who are at high risk of PPH and where blood transfusion facilities are not available.
Final remarks

- Modified B-Lynch technique is an effective uterus conserving procedure with a relatively low morbidity to control severe PPH without hampering future fertility.

- Uterine compression sutures, if done correctly and timely, have replaced uterine artery ligation, hypogastric artery ligation and postpartum hysterectomy to a greater extent for the surgical treatment of uterine atony.
Bibliography

- Keith L. Postpartum hemorrhage: A cure that eludes us. Int J Gynecol Obstet 2009;104:3
- Treloar EJ, et al. Uterine necrosis following B-Lynch suture for primary postpartum haemorrhage. BJOG 2006;113:486