Postpartum hemorrhage

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Postpartum hemorrhage (PPH)

- leading cause of maternal mortality
- direct pregnancy-related maternal mortality rate in the United States is approximately 7-10 women per 100,000 live births.
- PPH usually ranks in the top 3 causes of maternal mortality, along with embolism and hypertension
- World Health Organization statistics suggest that 25% of maternal deaths are due to PPH
- accounting for more than 100,000 maternal deaths per year

Definition

- PPH is defined as blood loss of more than 500 mL following vaginal delivery or more than 1000 mL following cesarean delivery
- Primary/ early - a loss of 500 mL for vaginal delivery or 1000mL for cesarean within the 1st 24hrs after birth
- 2ndry/late- a loss of 500 mL for vaginal delivery or 1000mL for cesarean delivery 24hrs after birth

- loss is 10% or more drops in hematocrit value [13].
- The concept of massive postpartum hemorrhage
- was recently defined to include blood loss (more
- than 1500 ml), a drop in hemoglobin concentration
- (.4 g/dl), and an active massive transfusion
- (.4 units of blood)

Risk factors

- most common- uterine atony
- uterine atony- failure of the uterus to contract and retract following delivery of the baby
- randomized trial in the United States- birthweight

labor induction and augmentation

chorioamnionitis

magnesium sulfate use

+ history of pph

BMI over 40

- Pregnancy causes an increase of 50% in maternal blood volume to compensate for the perfusion during delivery 4-6l
- In normal cases the uterus contracts the myometrium which then compress the spiral arteries which maintains the balance of homeostasis

❖thorough knowledge of vascular anatomy of the pelvis is essential to ensure the safety and effectiveness of embolization in overcoming the intractable bleeding.

❖ The main pelvic blood supply during PPH is the uterine artery that arises from internal iliac artery

Other branches include the superior vesical,middle hemorrhoidal, inferior hemorrhoidal and vaginal arteries. The arcuate arteries are branches of the uterine artery that extend inward into the myometrium, and also have a circumferential course around the myometrium. The arcuate arteries give rise to radial arteries that are directed toward the uterine cavity to become thespiral arteries in the endometrium

- venous plexus runs parallel to the arteries
- seen on the late phase of angiograms

Angiogram of the right uterine artery demonstrating

- spiral arteries

treatment

- Postpartum hemorrhage is an emergent clinical scenario and requires immediate medical attention
- in the treatment of massive or intractable bleeding. In the setting of ongoing bleeding after the delivery, conservative management is the first approach.
- Measures include vaginal packing, uterine massage,
- intravenous administration of uterotonic medications such as oxytocin or methylergonovine, curettage of retained placenta, fluid replacement and blood transfusion.

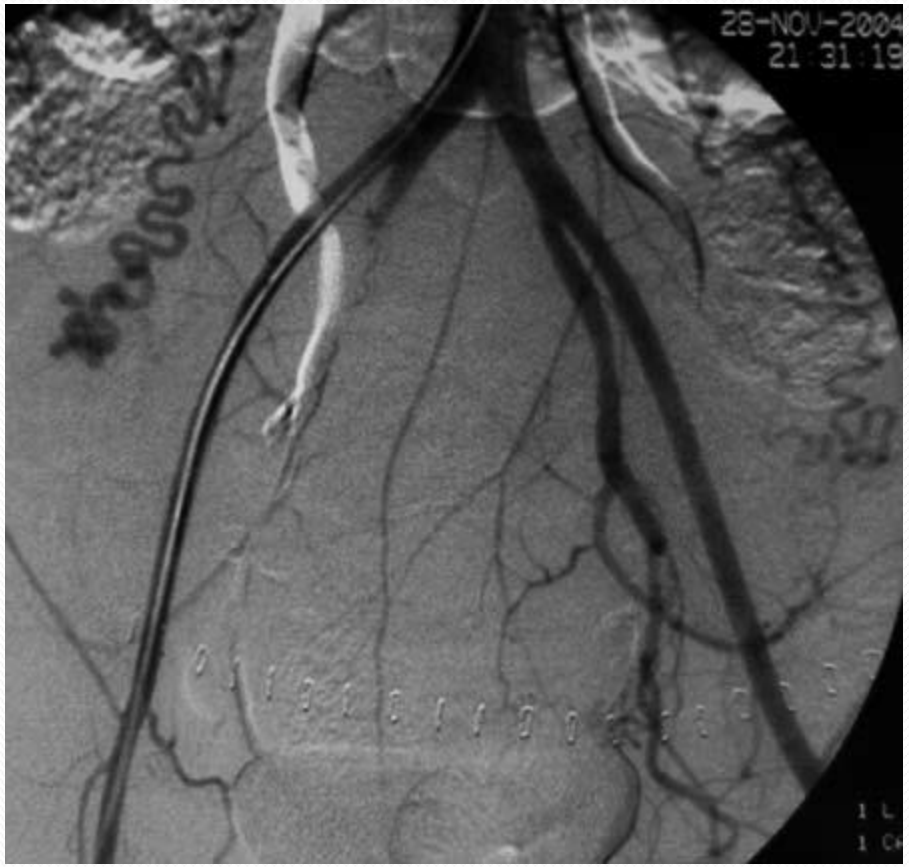
- Embolotherapy should be considered when these measures fail
- Right femoral artery access is obtainedand a 4-or 5-F sheath is inserted
- Catheterization of bilateral uterine arteries is mandatory
- A cobra-shaped catheter is the best catheter to use for easy insertion into uterine arteries
- three different types, each according to the degree of opening of the curve.
- The medium sized catheter (C2) is the one most commonly used

- The contralateral internal iliac artery is catheterized first and can be reached by pushing the cobra.
- The ipsilateral uterine artery access is obtained using the Waltman loop
- Angiography can detect contrast medium extravasation; however, this is not seen in the majority of cases.
- Even without extravasation, bilateral uterine artery embolization needs to be performed

- The preferred embolic agent is a material that is resorbable
- The one most widely used is Gelfoam.
- Gelfoam can be cut into different sizes depending on the target vessel diameter.
- The Gelfoam can also be cut in torpedo and inserted into a 1-ml syringe

- aortogram is performed to demonstrate the effectiveness of the procedure and the course of ovarian arteries that might be embolized secondarily in cases of rebleeding

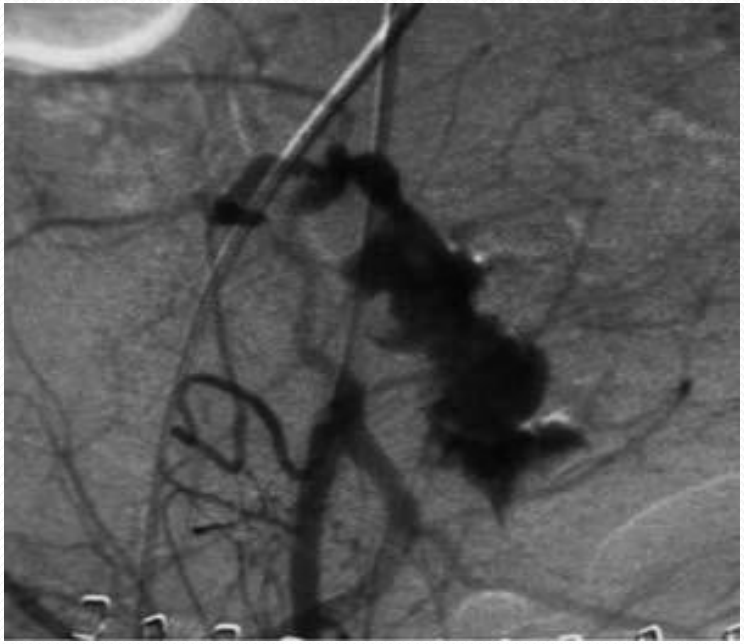
Final aortogram showed complete occlusion of uterine arteries. The patent ovarian arteries were demonstrated

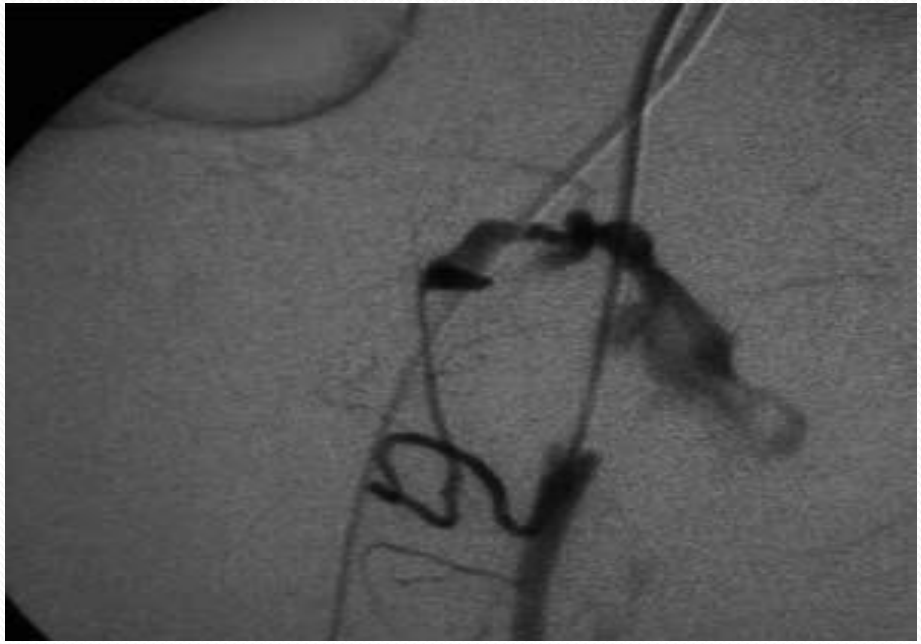


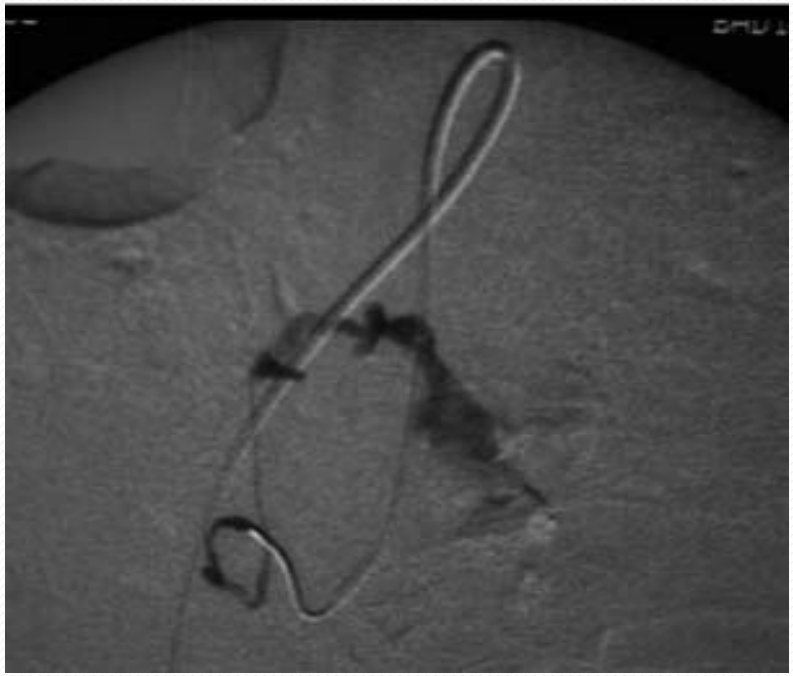
- Blood transfusion represents a major component during the medical management of severe postpartum hemorrhage
- A transfusion may be initiated in patients who continue bleeding, developing shock despite aggressive medical management
- Although now due to hep b, hep c and hiv blood transfussions are being limited today

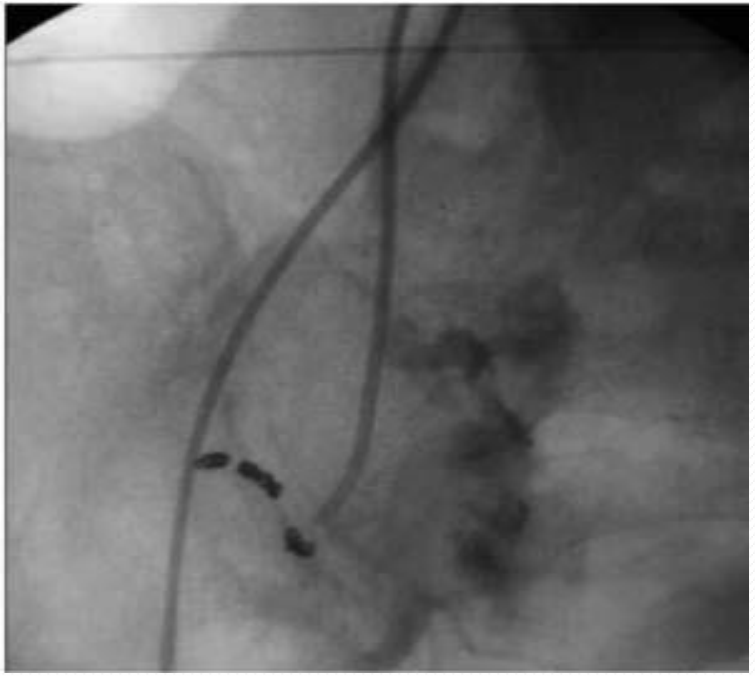
- Even though the first goal of embolization following PPH is to achieve hemostasis and overcome a lifethreatening condition, this technique clearly helps the patient to avoid hysterectomy, thus preserving fertility.

- Angiogram of right internal iliac artery demonstrates contrast media extravasation
- catheterization using microcatheter and embolization with microcoils









Surgical treatments

- Bilateral internal iliac ligation and hysterectomy are the two surgical treatments that unfortunately are still very commonly used to control PPH
- Hysterectomy is the other surgical treatment that is widely used. This surgery is a high-risk procedure in patients with DIC and hemodynamic impairment, and hysterectomy will not treat the cervicovaginal laceration
- the infertility associated with hysterectomy is an important issue in this young population group. Although this surgical procedure is the only treatment available to control a PPH in some conditions, it should, however, be only used as the last resort.