Postpartum Hemorrhage

Postpartum hemorrhage has been defined as the loss of 500 ml of blood or more after completion of the thirh stage of labor. Aproximately 5 percent of women delivering vaginally lose more than 1000 ml of blood.

- Primary Hemorrhage
- Secondary hemorrhage

Etiology – Primary Hemorrhage

- Primary hemorrhage occurs in 1st 24 hours
- Occurs in 4-6% of pregnancies
- Caused by The Four T's
  - Tone – atony (80% of all cases)
  - Tissue – retained POC, accreta, uterine inversion
  - Trauma – cervical or vaginal laceration, rupture
  - Thrombic events – defects in coagulation
    - Inherited or acquired

Etiology of Postpartum Haemorrhage

Tone	**Uterine atony 95%**
Tissue	**Retained tissue/clots**
Trauma	**laceration, rupture, inversion**
Thrombin	**coagulopathy**

Mechanisms of normal hemostasis

Spiral arteries have no muscular layer because of endotrophobelastic remodeling, which creates a low pressure system . hemostasis is achieved first by myometrial contraction.

- Estimated blood loss is commonly only approximateiy half the actual loss.
- The blood volume of a pregnant women with normal pregnancy-induced hypervolemia usually increases from 30 to 60 percent-1500 to 2000 ml.

Estimated of blood loss

- If blood loss is less than the pregnancy added volume, the hematocrit remains the same acutely and during the several days. It then increases as no pregnant plasma volume normalizes during the next week .
- Whenever the postpartum hematocrit is lower than one obtained on admission for delivery, blood loss can be estimated as the sum of the calculated pregnancy-added volume plus 500 ml for each 3 volume percent decrease of HCT.

Uterine Atony

- The most frequent cause of obstetrical hemorrhage is failure of uterus to contract sufficiently after delivery.

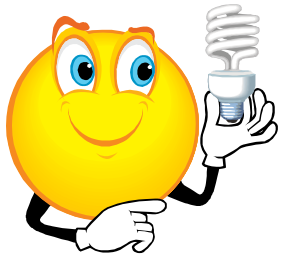
Risk Factors

- Prolonged labor (also augmented labor)
- Rapid labor
- History of postpartum hemorrhage
- Preeclampsia
- Distended uterus
  - Macrosomia, twins, polyhydramnios
- Chorioamnionitis
- Operative delivery

Prevention

- Be prepared
- Active management of third stage
  - Prophylactic oxytocin
  - 10 U IM
  - 5 U IV bolus
  - 10-20 U/L N/S IV @ 100-150 ml/hr
  - Early cord clamping and cutting
  - Gentle cord traction with surapubic countertraction

Remember!



- Blood loss is often underestimated
- Ongoing trickling can lead to significant blood loss
- Blood loss is generally well tolerated to a point

Diagnosis ?

- Assess in the fundus
- Inspect the lower genital tract
- Explore the uterus
  - Retained placental fragments
  - Uterine rupture
  - Uterine inversion
- Assess coagulation

What to Do Next?!

What to Do Next?!

- Postpartum hemorrhage is a sign, not a diagnosis – find out what is causing bleeding
- Calmly work your way through the list of possible causes
  - If you get to the end of the list and don't have an answer then start again at the top of the list
- Call for help if needed
  - Extra nurses, anesthesia, Ob/Gyn

Initial Evaluation

- Atony is the most common cause for bleeding
  - Pelvic exam, uterine massage, expel clots
  - Manual exam of the uterus
    - Yes, put your whole hand and arm inside
  - Consider draining the bladder
- Examine for lacerations
  - Consider move to OR for lighting & exposure
- Ask about history of clotting disorders

Management-

- **talk to and assess patient**
- **Get HELP!**
- **Large bore IV access**
- **Crystalloid-lots!**
- **CBC/cross-match and type**
- **Foley catheter**

Medical Management

TABLE 3

DRUG THERAPY FOR PPH

Drug	Dose	Side Effects	Contraindications
Oxytocin	10 units IM/IMM 5 units IV bolus 10 to 20 units/litre	Usually none painful contractions nausea, vomiting, (water intoxication)	hypersensitivity to drug
Methylergonovine maleate	0.25mg IM/0.125mg IV repeat every 5 mins as needed maximum 5 doses	peripheral vasospasm hypertension nausea, vomiting	hypertension hypersensitivity to drug
Carboprost (15-methyl PGF_2 alpha)	0.25 IM/IMM repeat every 15 mins as needed maximum 8 doses	flushing, diarrhea, nausea, vomiting bronchospasm, flushing, restlessness, oxygen desaturation	active cardiac, pulmonary, renal, or hepatic disease hypersensitivity to drug
Vasopressin	20 units diluted in 100 ml normal saline = (0.2 units/ml) inject 1 ml at bleeding site avoid intravascular injection	acute hypertension, bronchospasm nausea, vomiting, abdominal cramps angina, headache, vertigo death with intravascular injection	coronary artery disease hypersensitivity to drug

- **اکسی توسین(پیتوسین)**

۴۰-۱۰ واحد در ۱۰۰۰-۵۰۰ سی سی محلول سرعت ۶۰ قطره در دقیقه

۸۰ واحد در ۵۰۰ سی سی محلول در مواردی که منع مصرف مایع به میزان زیاد وجود دارد(احتمال کلاپس قلبی- عروقی، پره اکلامپسی، افت شدید فشار خون...)

- **متیل ارگومتورین(مترژن)**

۰/۲ میلیگرم عضلانی و تکرار آن پس از ۱۵ دقیقه حداکثر ۱ میلی گرم، در صورت هیپرتانسیون تزریق نگردد.

- **۱۵- متیل پروستاگلاندین F2α**

(Hemabate, Carboprost))

۲۵۰میکروگرم عضلانی و در صورت نیاز تکرار آن هر ۱۵ دقیقه ، حداکثر ۸ دوز(در موارد آسم استفاده نشود و در صورت هیپرتانسیون با احتیاط استفاده شود). بهتر است اگر تا دو دوز موثر نبود روش دیگری انتخاب شود.

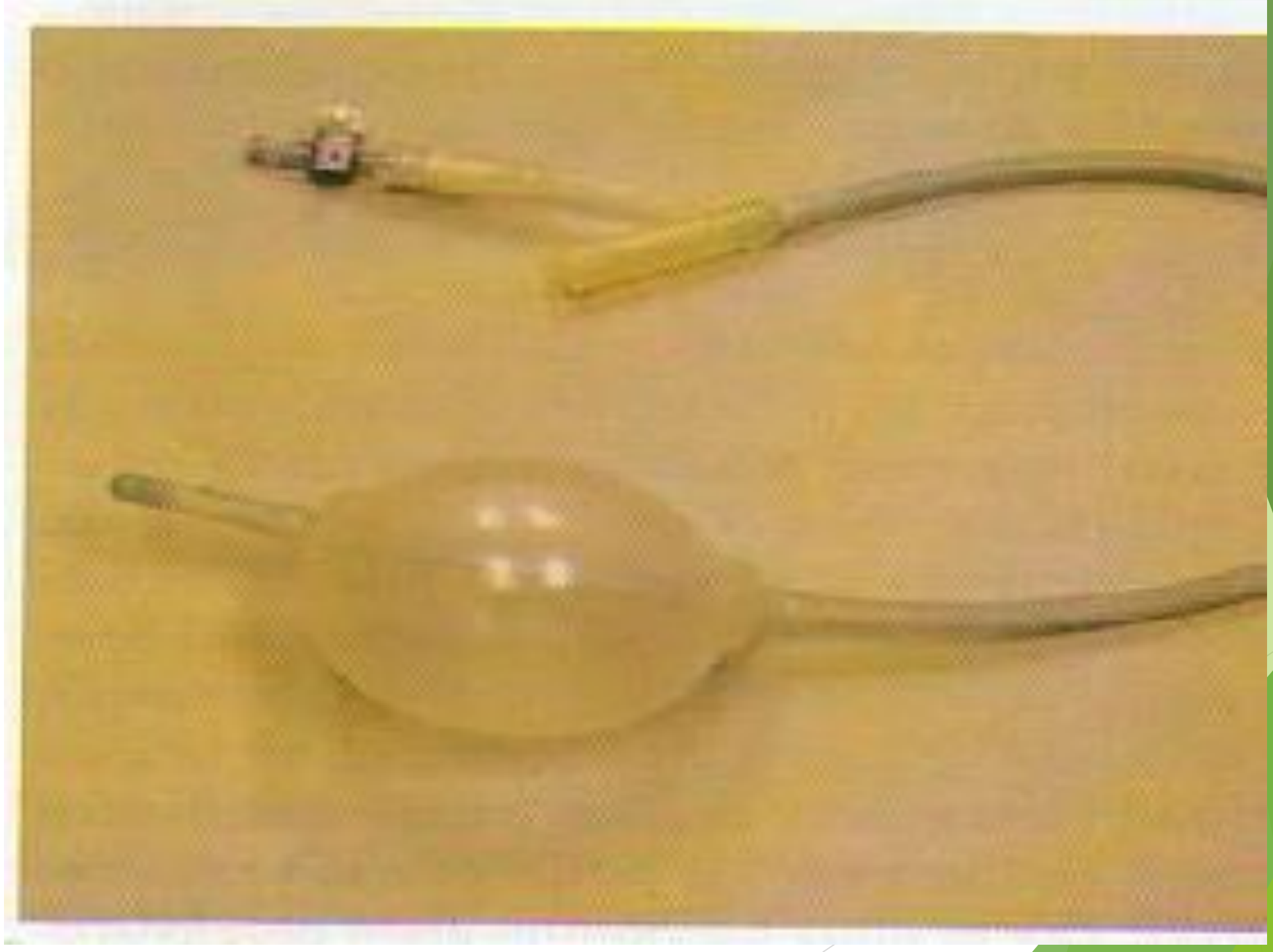
- **میزوپروستول (Cytotec)**:

- ۱۰۰۰-۸۰۰ میکروگرم PR
- ۶۰۰ میکروگرم خوراکی یا ۸۰۰ میکروگرم زیر زبانی

- **ترانکزامیک اسید(TXA)**

یک گرم IV در ۱۰ دقیقه(اضافه کردن یک ویال یک گرمی در ۱۰۰ میلی لیتر نرمال سالین در حداکثر ده دقیقه، در صورت نیاز ۳۰ دقیقه بعد تکرار شود)

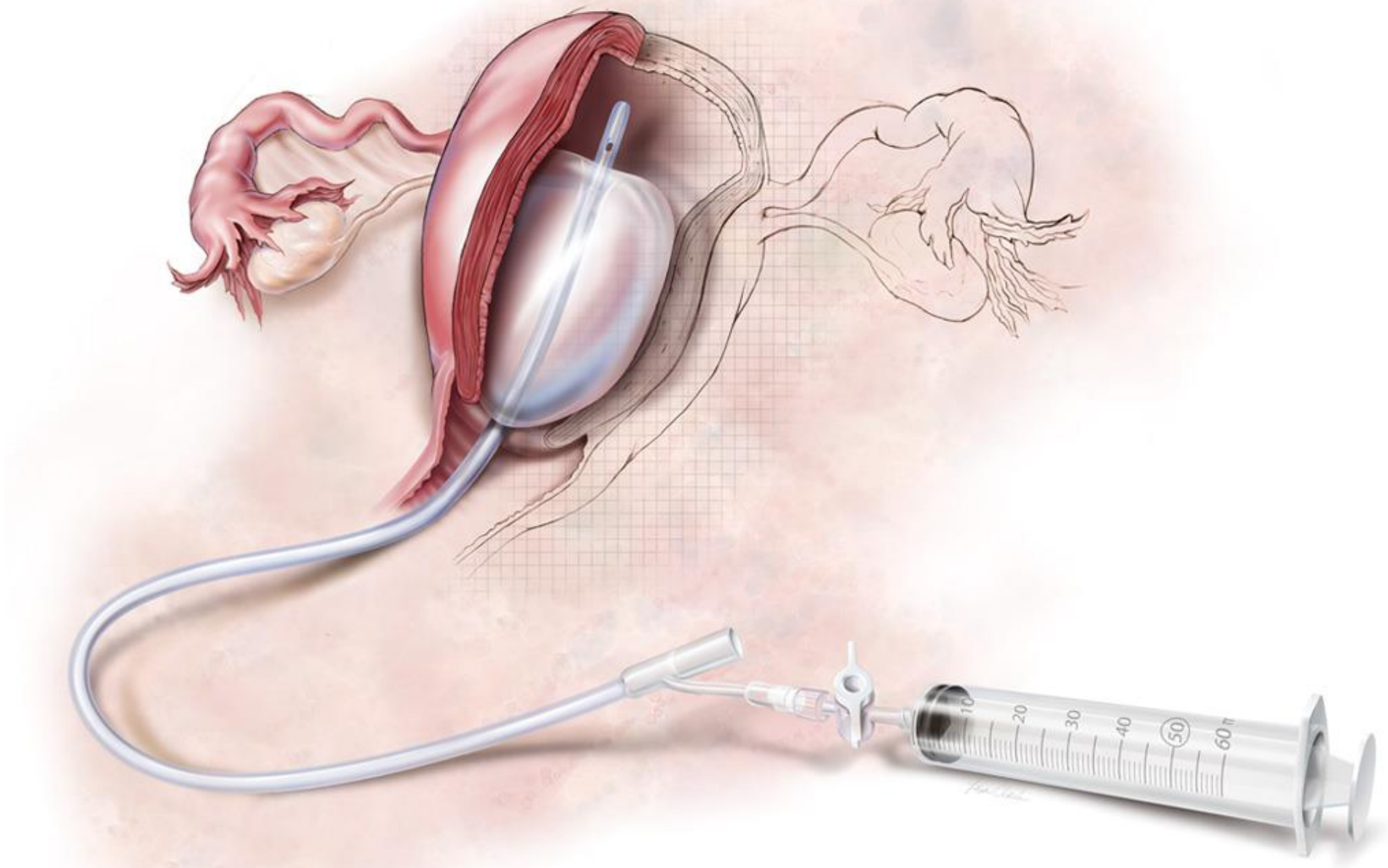
- Uterine tamponade
  - Packing with guaze
    - Can soak with thrombin
  - Intrauterine foley catheter
    - One or more bulbs, 60-80ml of saline
  - Bakri tamponade balloon
    - 300-500ml of saline



COOK MEDICAL

Bakri

POSTPARTUM BALLOON



Surgical Management

- Consider surgical management when uterotonic agents (± tamponade) don't work
- Uterine curettage
- Exploratory laparotomy
  - Bilateral uterine artery ligation (O'Leary sutures)
  - B-Lynch technique
  - Hypogastric artery ligation
  - Hysterectomy

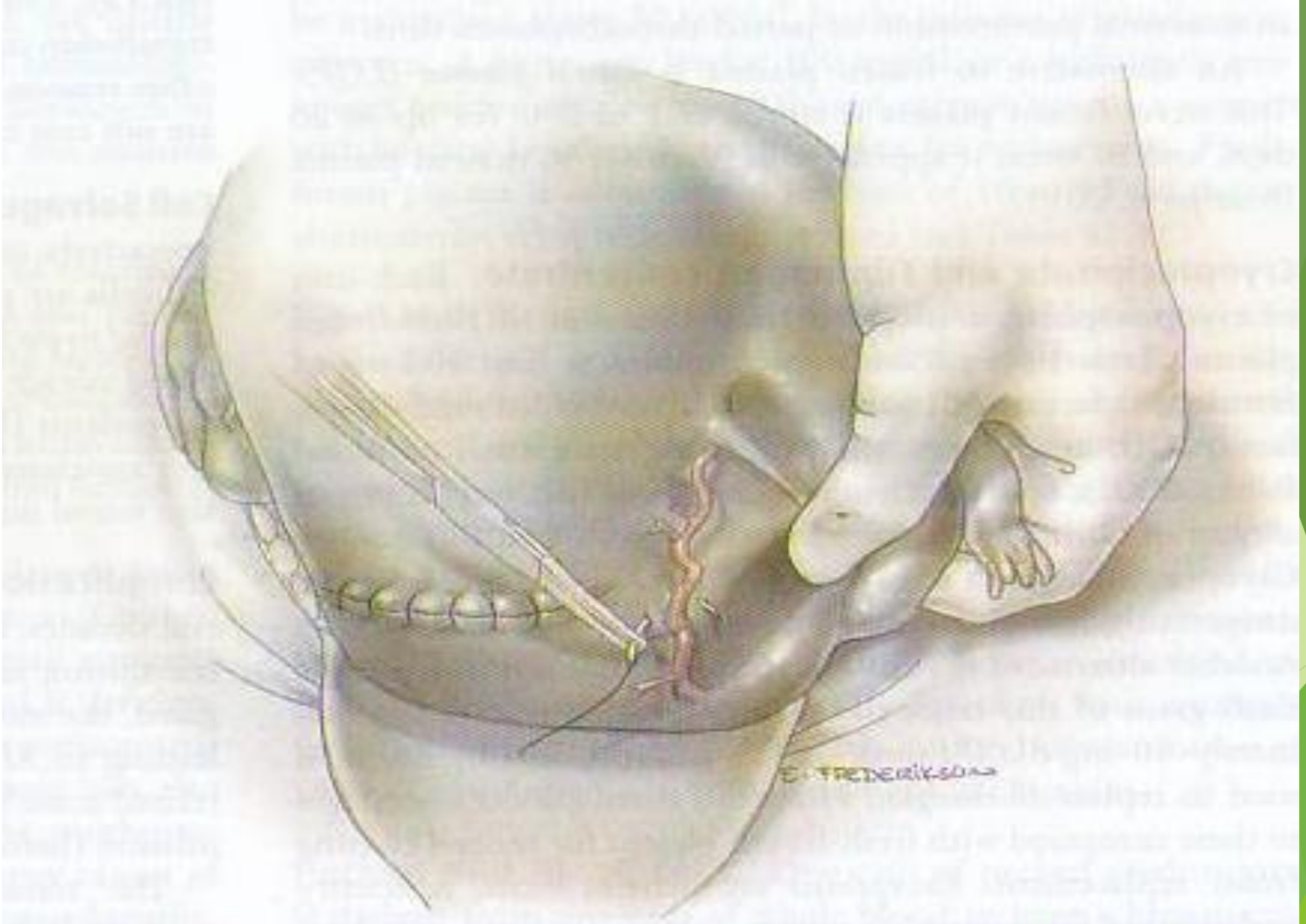
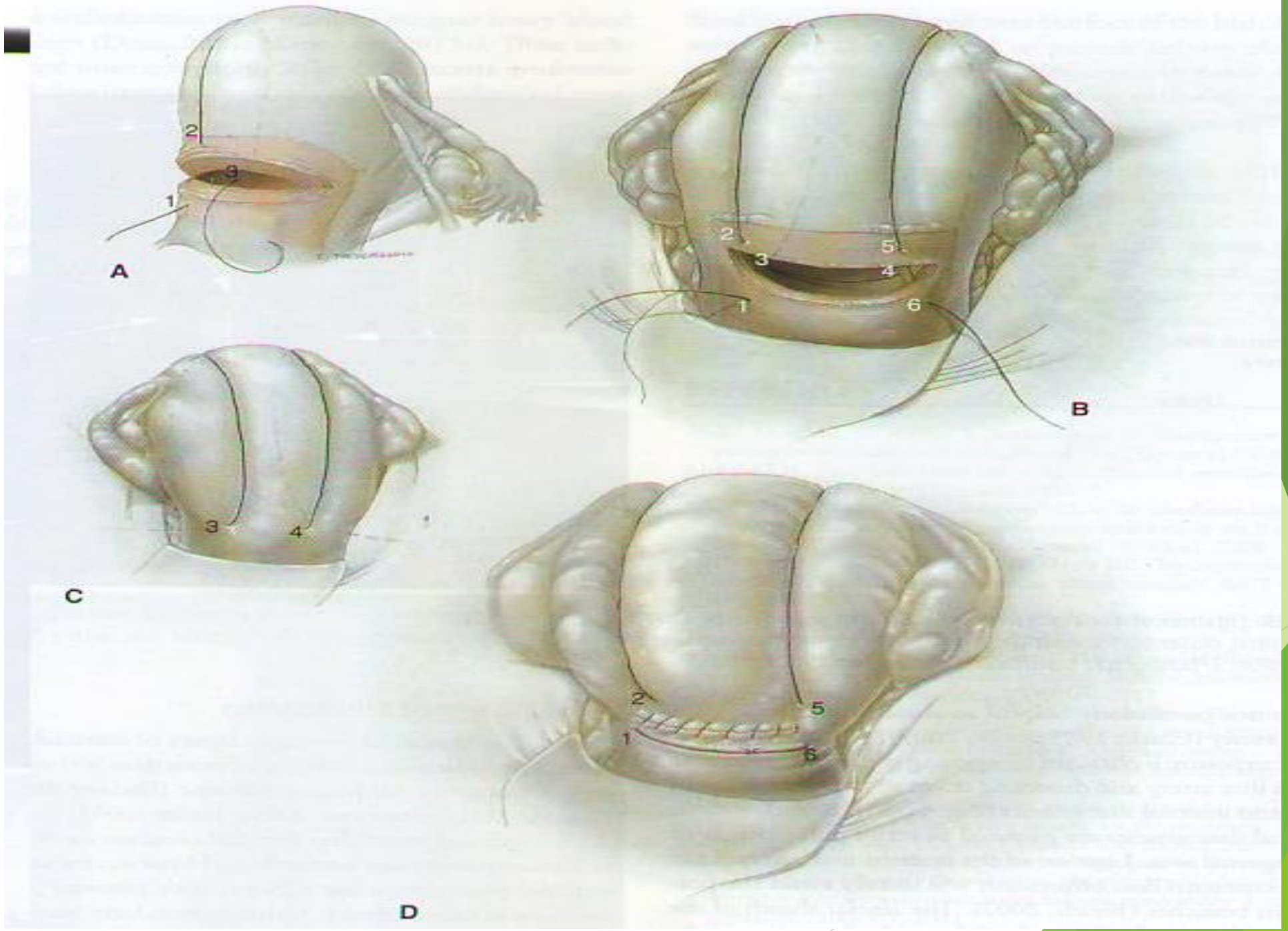


FIGURE 41-33 Uterine artery ligation. The suture goes through the lateral uterine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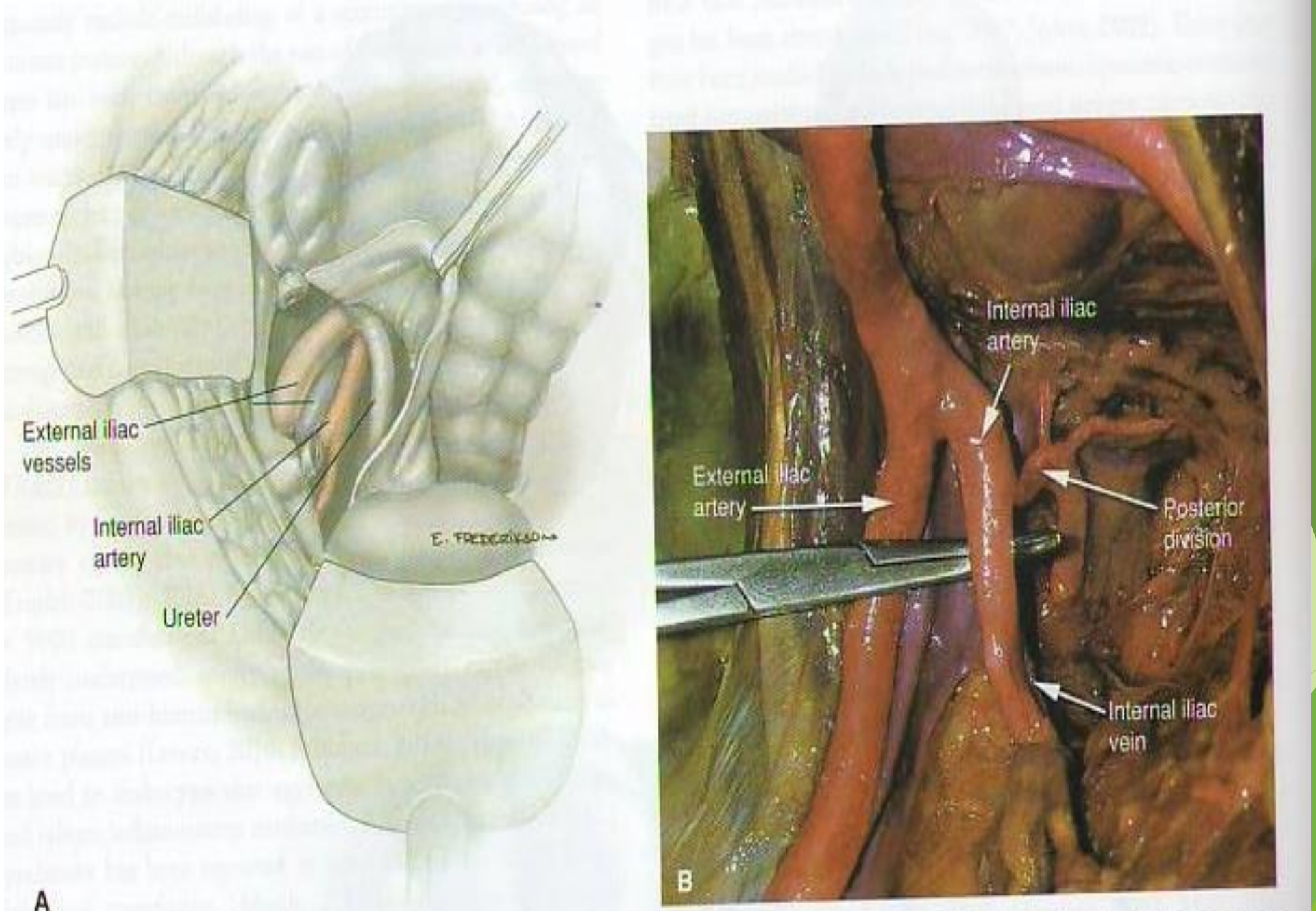


FIGURE 41-35 Ligation of the right internal iliac artery. **A.** The peritoneum covering the right iliac vessels is opened and reflected. **B.** Unem-

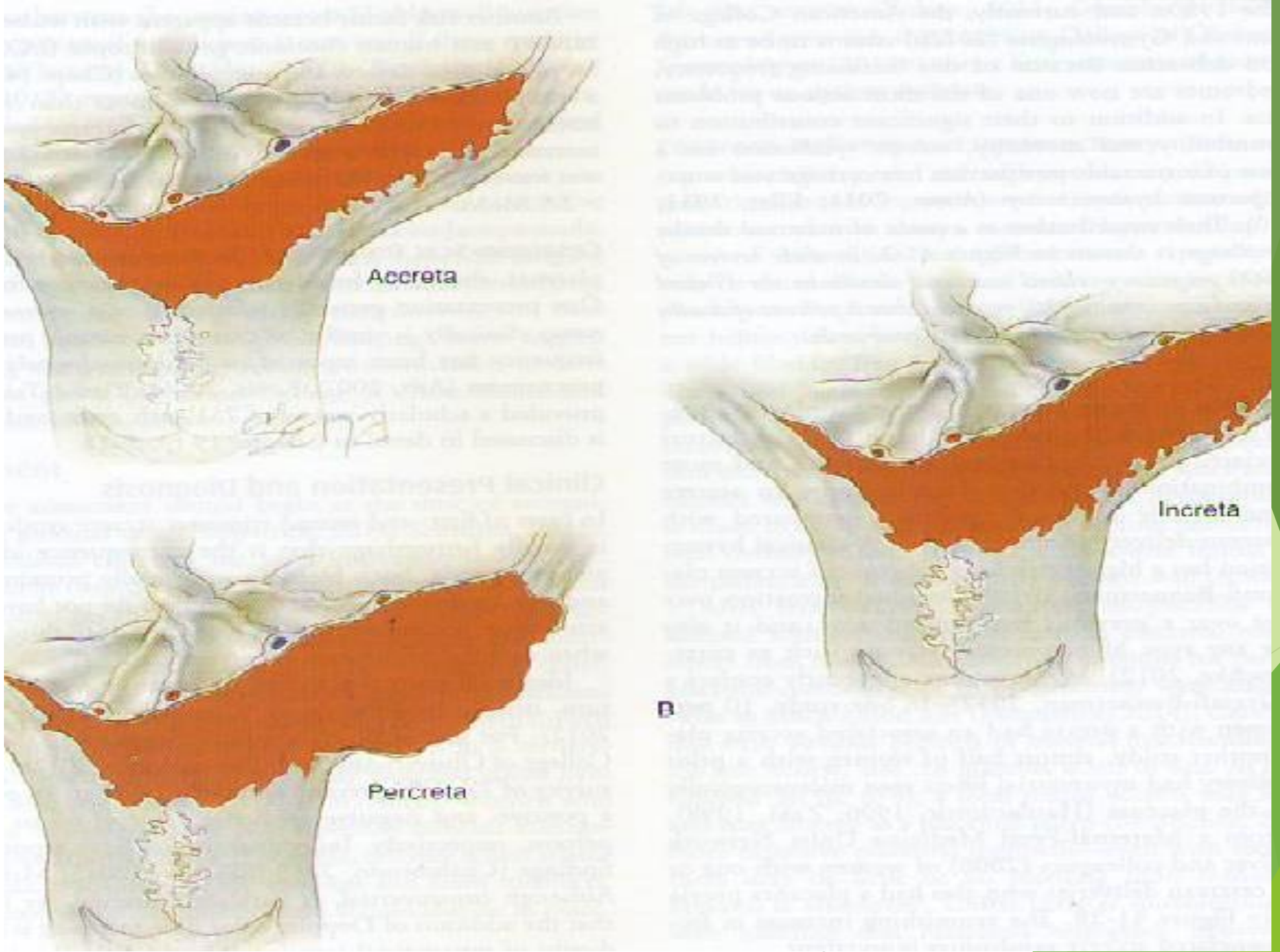
Placenta accrete syndromes

These syndromes describe the abnormally implanted , invasive, or adhered placenta.

:Classification

Variants of placenta accrete syndrome are classified by the depth of trophoblastic growth.

- Accrete
- Increta
- pretreat

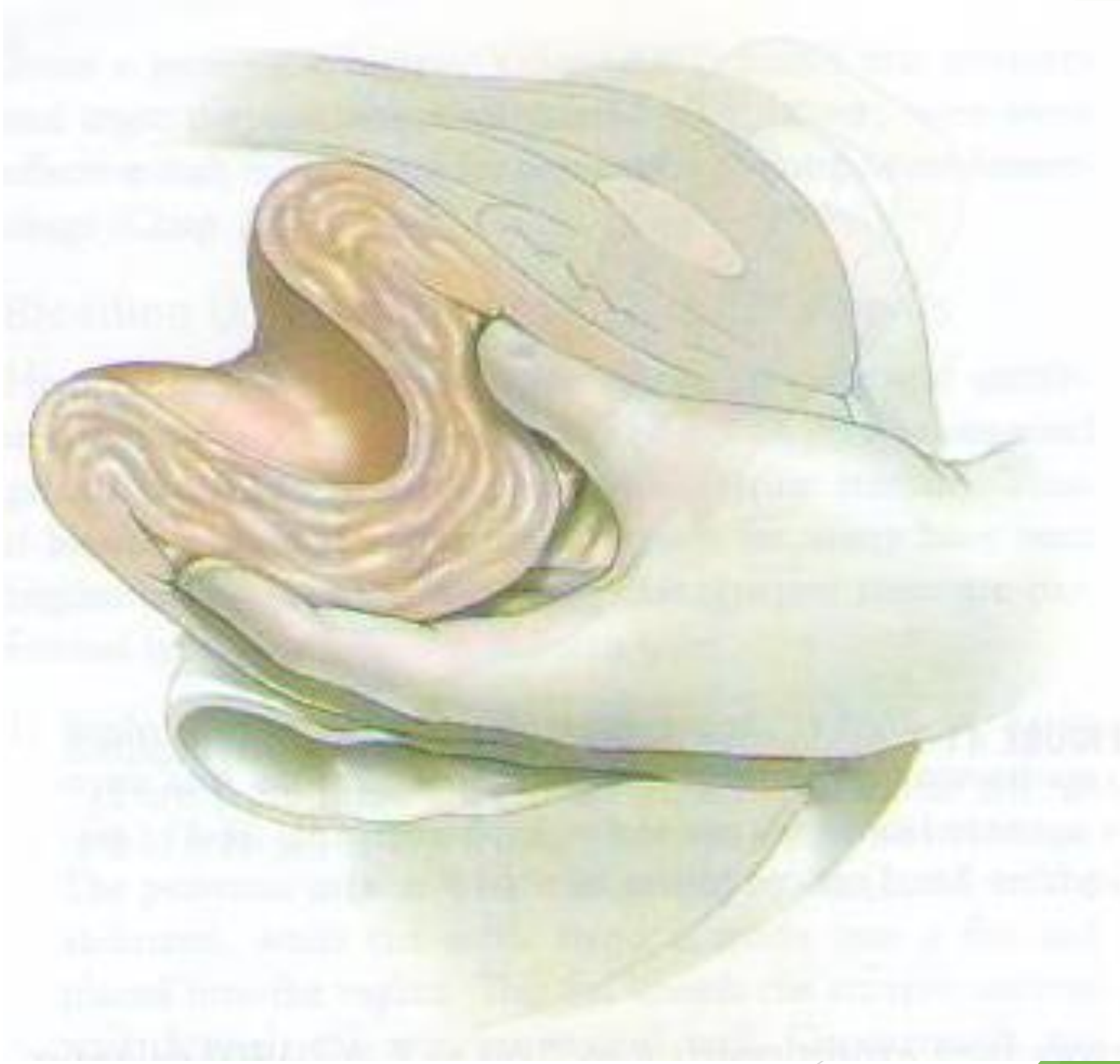

Accreta
Percreta
Increta
B

Uterine inversion:

- Puerperal inversion of the uterus is considered to be one of the classic hemorrhage

Risk factors include alone or in combination:

1. Fundal placental implantation
2. Delayed-onset or inadequate uterine contractility after delivery of the fetus.
3. Cord traction applied before placental separation.
4. Abnormally adhered placentation



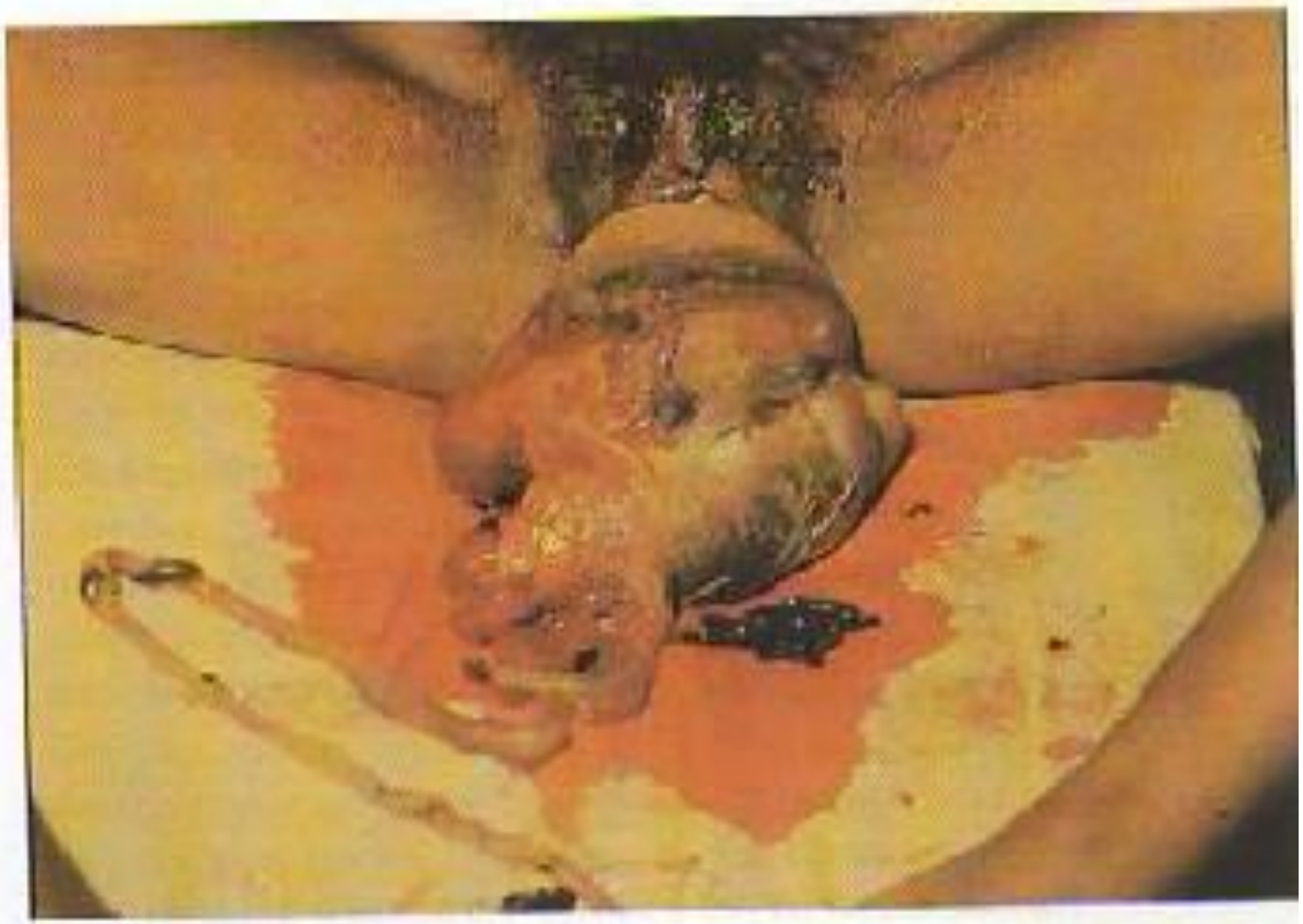


FIGURE 41-6 Maternal death from exsanguination caused by uterine inversion associated with a fundal placenta accreta during a home delivery.

Injuries of the Birth Canal

1. Vulvovaginal laceration
2. Levator sling injuries
3. Cervical laceration

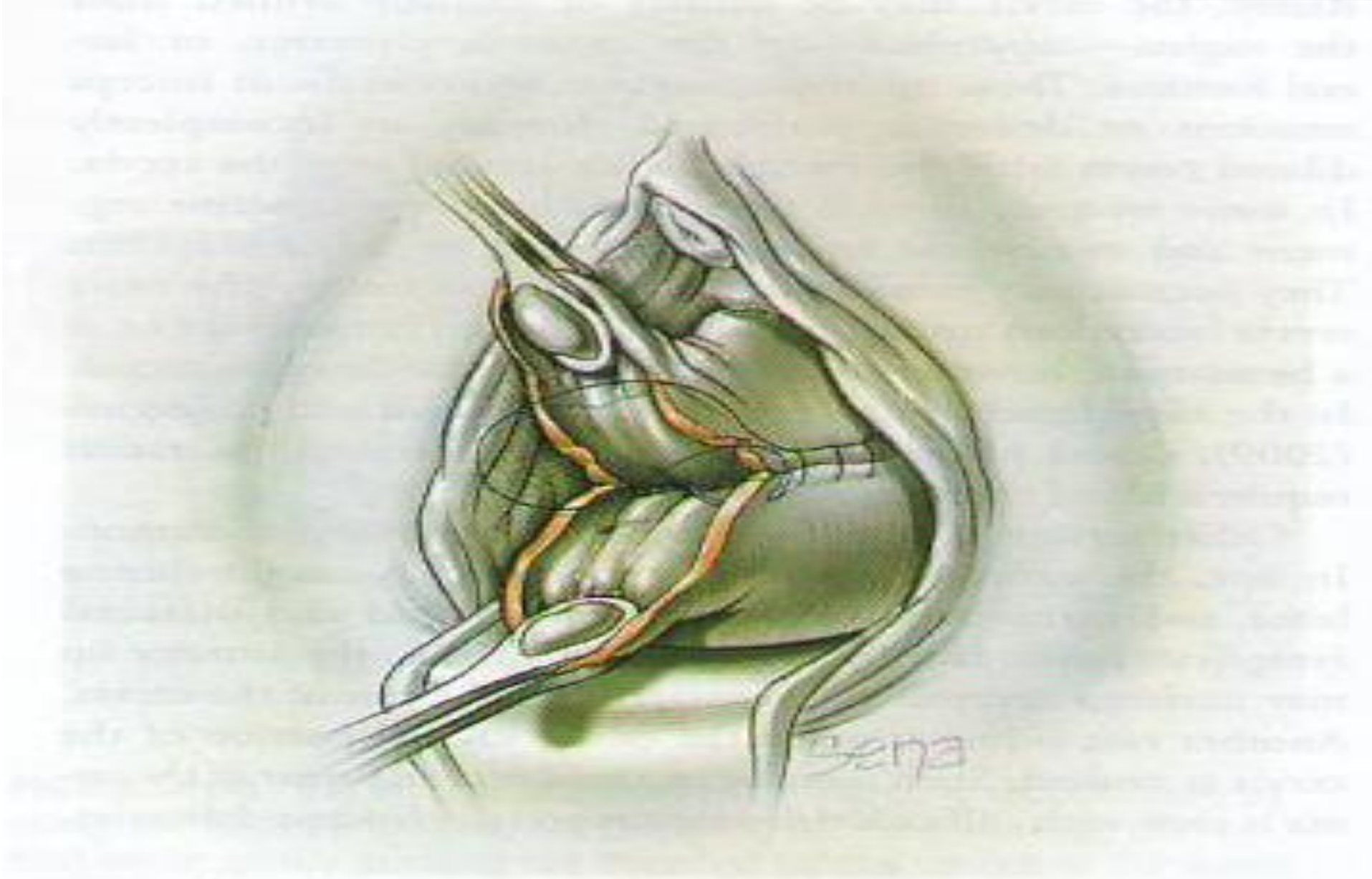
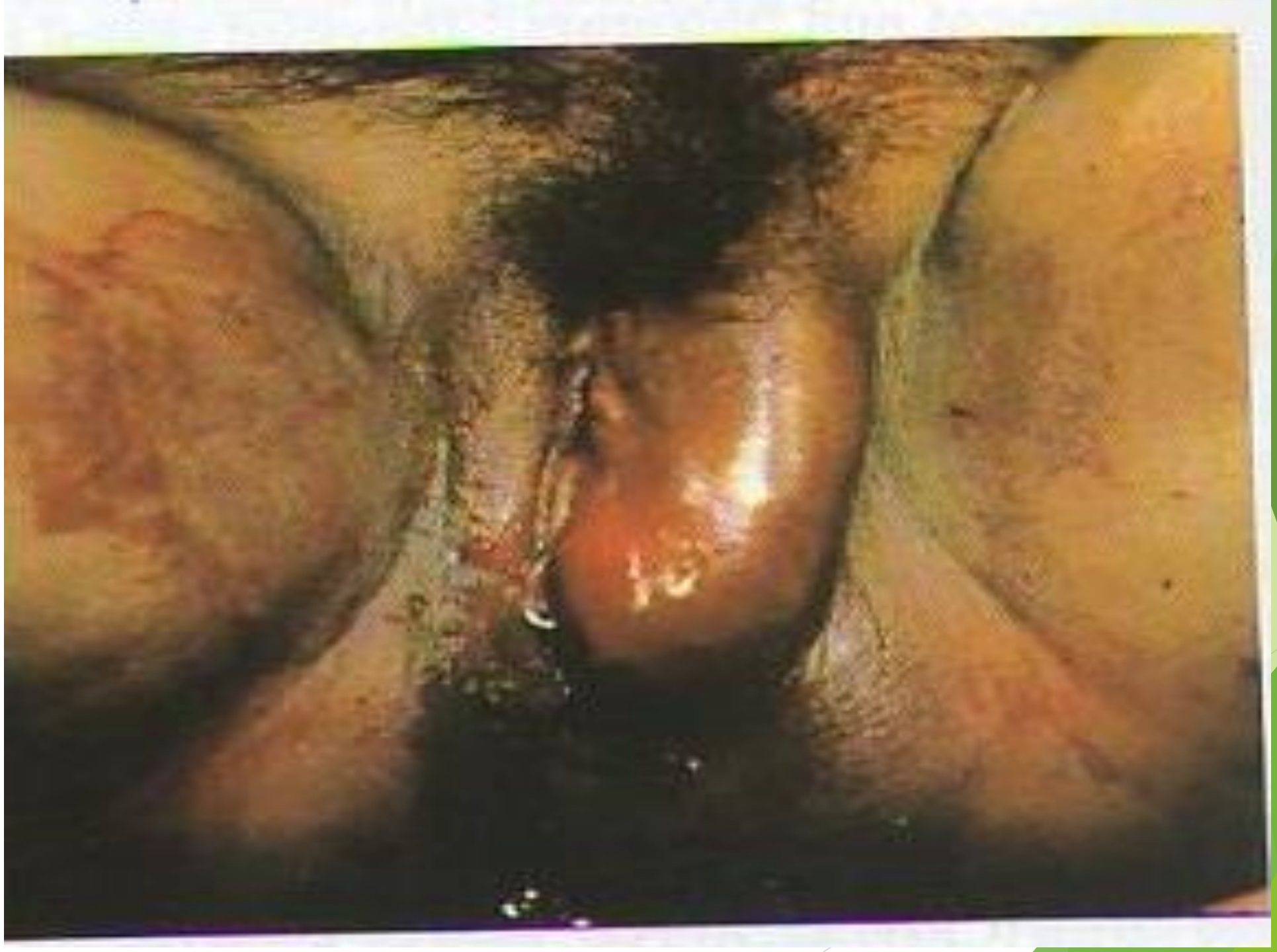


FIGURE 41-10 Repair of cervical laceration with appropriate surgical exposure. Continuous absorbable sutures are placed beginning at the upper angle of the laceration.

Puerperal Hematomas

They are most often associated with a laceration , episiotomy or an operative delivery



Rupture of the Uterus

In addition to the prior cesarean hysterotomy incision already discussed, risks for uterine rupture include other previous operations or manipulations that traumatize the myometrium. Examples are: uterine curettage , perforation , endometrial ablation , myomectomy , hysteroscopy

Late postpartum hemorrhage

- Bleeding after the first 24 hours

Etiology – Secondary hemorrhage

- Secondary hemorrhage occurs 24h to 6-12w
- Causes include:
  - Subinvolution of pacental site
  - Retained POC
  - Infection
  - Inherited coagulation defects

Adjunctive surgical procedures to treat hemorrhage

- Uterine artery ligation
- Uterine compression sutures
- Internal iliac artery ligation
- Angiographic embolization
- Preoperative pelvic arterial catheter placement
- Pelvic umbrella pack


THANKS FOR
YOUR
ATTENTION