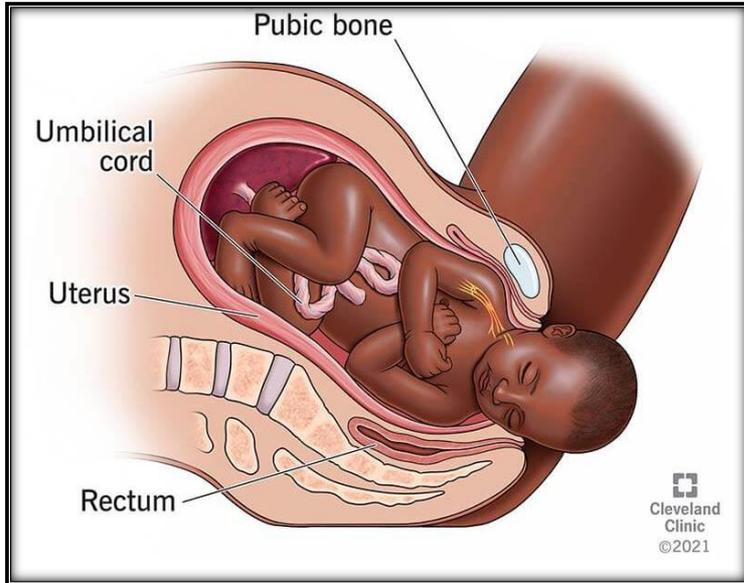


Obstetric Emergencies

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01



Shoulder Dystocia

Definition

- Impaction of the fetal shoulders at the maternal pelvis, occurring after the birth of the head.
- It is defined by the need for additional obstetric maneuvers to assist the birth of the infant, when routine axial traction has failed to deliver the anterior shoulder.

- Shoulder dystocia occurs when either the anterior, or less commonly the posterior, fetal shoulder impacts on the maternal symphysis, or sacral promontory, respectively

Vary in reported incidence:
0.58%-0.70%.

Shoulder Dystocia



Anterior fetal shoulder impacts on the maternal symphysis pubis

Posterior fetal shoulder impacts on the maternal sacral promontory

Maternal/Antepartum Risk Factors

S

Small Pelvic Inlet

D

Diabetes and Fetal Macrosomia

A

Advanced age

O

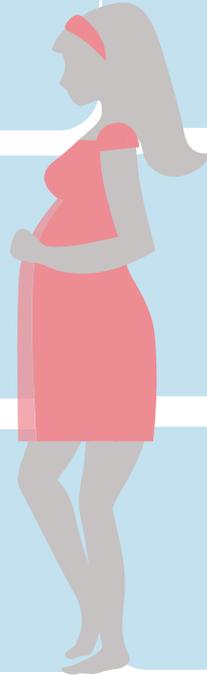
Obesity

P

Prior history of shoulder dystocia or large infants

E

Excessive maternal weight gain



Intrapartum Risk factors

- Prolonged first stage
- Prolonged second stage
- Augmentation of labor
- Instrumental birth (forceps or vacuum)

Prediction

Shoulder dystocia cannot accurately be predicted by either risk factors or imaging studies predicting fetal weight.

Prediction

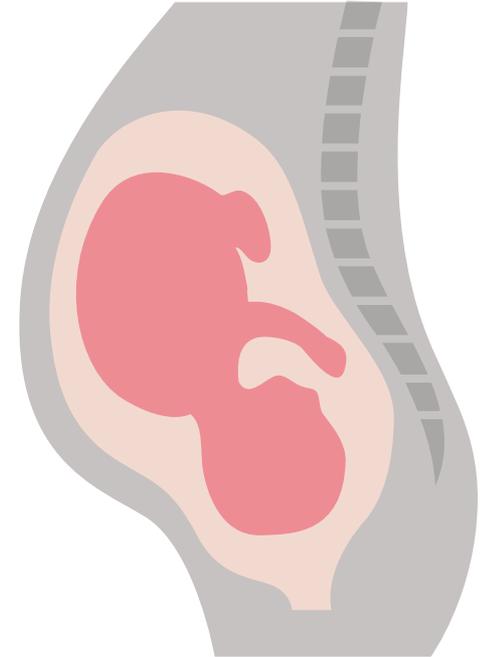
1. Risk assessments for the prediction of shoulder dystocia are insufficiently predictive to allow prevention of the large majority of cases.
2. There is a relationship between fetal size and shoulder dystocia, but it is not a good predictor partly because Fetal macrosomia is difficult to accurately predict. At term, fetal sonography has at least a 10% margin of error for diagnosis of macrosomia.
3. 50% of SD occurs in normal-sized fetuses and 98% of large babies do not have SD.
4. Infants of diabetic mothers have a two- to four-fold increased risk of shoulder dystocia compared with infants of the same birth weight born to non-diabetic mothers .
5. The most significant risk factor is SD with a previous birth, which increases the incidence to 12% to 17%.

Recognition and Diagnosis

There are a number of clinical signs that may precede an shoulder dystocia, which include:

- Difficulty with delivery of the face and chin
- The head remaining tightly applied to the vulva
- Turtle-neck sign: Head retracts back inside birth canal after each push/after each delivery.
- Failure of restitution of the fetal head
- Failure of the shoulders to descend using gentle downward traction.

However, a diagnosis cannot be made until there is **failure of delivery of the anterior shoulder** with **routine axial traction** and any other traction should be avoided



Management

In addition:

- The problem should be stated clearly as 'this is shoulder dystocia' to the arriving team.
- Maternal pushing should be discouraged
- An episiotomy is not always necessary.

EXAM TIP

Fundal pressure should never be used to relieve a shoulder dystocia.

WARD TIP

Shoulder dystocia is a boney problem. Episiotomy only creates more soft tissue space for providers to attempt maneuvers, it in itself does not relieve the impacted shoulder.

ALSO HELPERR (Baxley and Gobbo, 2004)

Call for Help	H
Evaluate for Episiotomy	E
Legs (The McRoberts manoeuvre)	L
Suprapubic Pressure	P
Enter manoeuvres (internal rotation)	E
Remove the posterior arm	R
Roll the patient	R

First Line

Second Line

First Line Maneuvers

McRoberts Maneuver

Flexion and abduction of the maternal hips, positioning the maternal thighs on her abdomen. It straightens the lumbosacral angle, rotates the maternal pelvis towards the mother's head and increases the anterior-posterior diameter of the pelvis. It is an effective intervention with reported success rates as high as 90%.

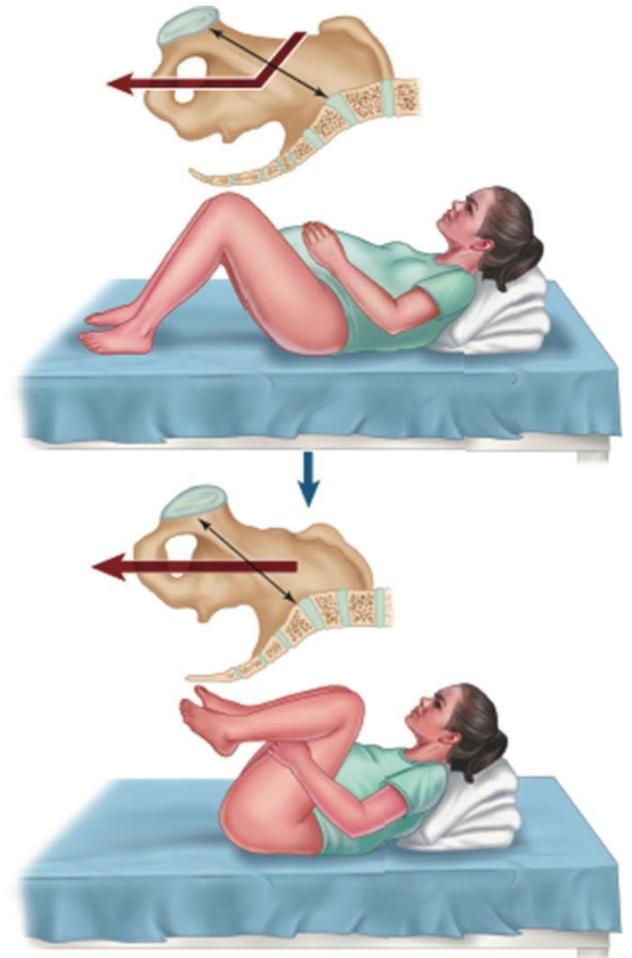


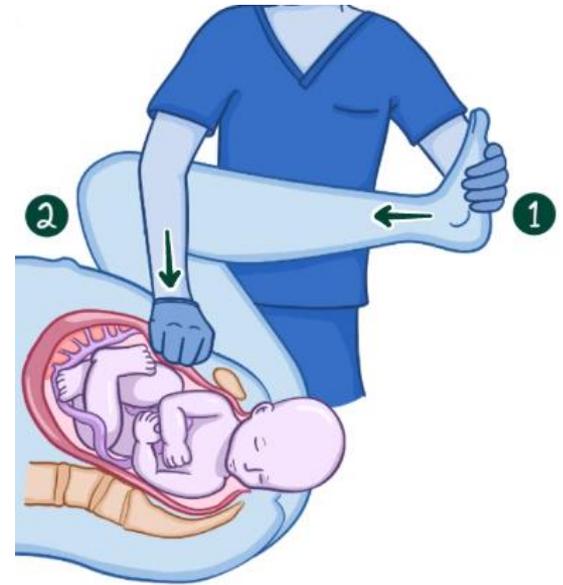
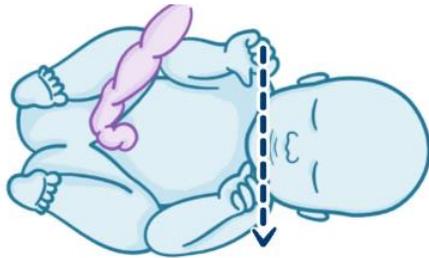
FIGURE 8-1. McRoberts maneuver for shoulder dystocia. (Reproduced, with permission, from Ganti L. *Atlas of Emergency Medicine Procedures*. New York, NY: Springer Nature; 2016.)

First Line Maneuvers

Suprapubic Pressure

Reduces the fetal bisacromial diameter and rotates the anterior fetal shoulder into the wider oblique pelvic diameter.

Apply pressure slightly superior to the symphysis pubis at a 45 degrees angle in the direction of desired shoulder rotation.



Second Line Maneuvers

Internal maneuvers or 'all-fours' position should be used if the McRoberts maneuver and suprapubic pressure fail.

Internal maneuvers

- (1) Delivery of the posterior arm to reduce the diameter of the shoulders
- (2) Internal rotation to move the shoulders away from the narrow anteroposterior pelvic diameter.

Both are performed with the insertion of the physician's hand posteriorly into the sacral hollow at 6 o'clock

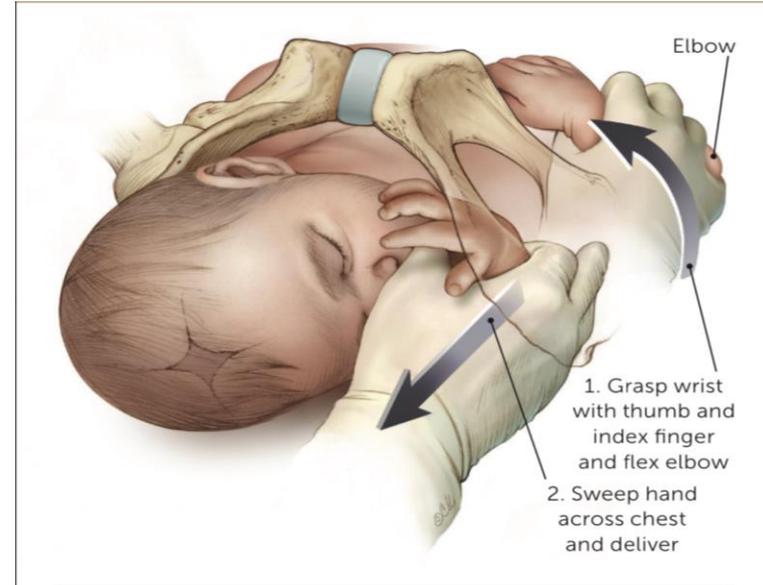
Second Line Maneuvers

Delivery of Posterior Arm

Delivering the posterior arm reduces the diameter of the fetal shoulders by the width of the arm.

The fetal wrist should be grasped and the posterior arm should be gently withdrawn from the vagina in a straight line across the chest.

Humeral fracture is a risk.

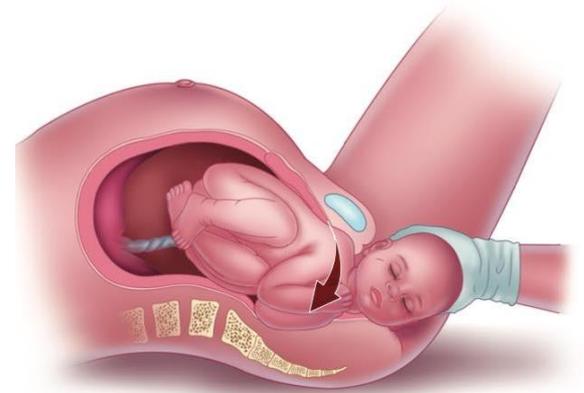
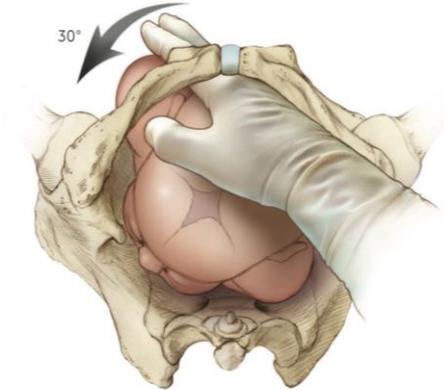


Posterior arm release. The physician's hand enters the pelvis posteriorly and travels along the fetal chest to grasp the fetal posterior wrist using an OK sign. The operator's hand should slide along the fetal chest, not the back, which may involve using the physician's nondominant hand depending on the direction the fetus is facing. Hooking the little finger around the fetal elbow may facilitate the maneuver. The arm is then swept across the fetal chest.

Second Line Maneuvers

Internal Rotational Maneuvers

Rubin II maneuver, the physician places two fingers into the vagina to push the scapula of the anterior fetal shoulder toward the fetal face to attempt to rotate the fetus 30 degrees.

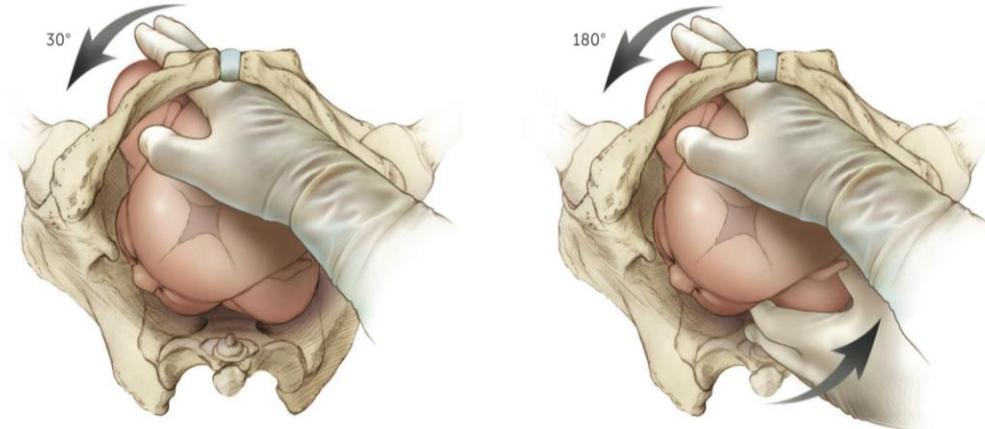


Second Line Maneuvers

Internal Rotational Maneuvers

The Woods maneuver combines the hand placement for the Rubin II maneuver with two fingers on the anterior aspect of the posterior fetal shoulder with the intent of rotating the fetus 180 degrees.

For the reverse Woods maneuver, fingers or hands are placed on the front side of the anterior shoulder and back side of the posterior shoulder to rotate the fetus 180 degrees.



Second Line Maneuvers

Gaskin or All-Fours Maneuver

This involves having the mother rotate on to her hands and knees this position may help to dislodge the shoulder by reducing the angle of the maternal pelvis .

The individual circumstances should guide the healthcare professional as to whether to try the 'all-fours' technique before or after attempting internal rotation and delivery of the posterior arm.

For a slim mobile woman without epidural anesthesia and with a single midwifery attendant, the 'all-fours' position is probably more appropriate, For a less mobile woman with epidural anesthesia in place, internal maneuvers are more appropriate.

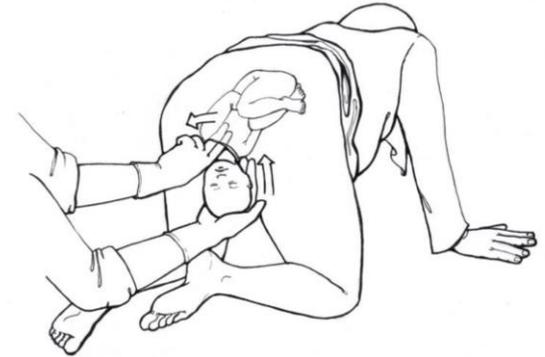


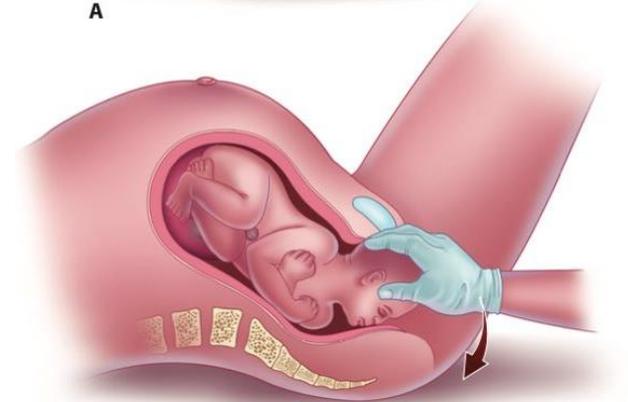
Figure 10 - Gaskin manoeuvre with rotation of posterior shoulder

Third-Line Maneuvers for Catastrophic SD

- (1) **Symphysiotomy**: division of the symphyseal joint with scalpel to increase the pelvic diameter.
- (2) **Cleidotomy**: (surgical division of the clavicle or bending with a finger).
- (3) **The Zavanelli Maneuver**: replacing the fetal head in the uterus by reversing the cardinal movements of labor and then birth by caesarean .



A



B

Complications

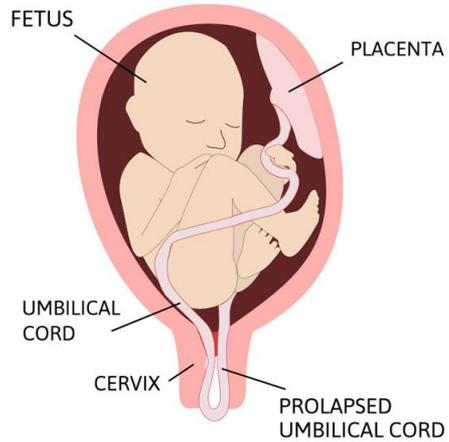


- ~ POSTPARTUM HEMORRHAGE
- ~ ↑↑ RISK of PERINEAL LACERATIONS
- ~ SPHINCTER INJURIES
- ~ UTERINE RUPTURE



- ~ DAMAGE to BRACHIAL PLEXUS
- ~ UMBILICAL CORD COMPRESSION
↳ HYPOXIA & ACIDOSIS
- ~ CLAVICULAR or HUMERAL FRACTURES
- ~ BRUISING & SUBDURAL HEMATOMAS
- ~ FETAL DEATH

02



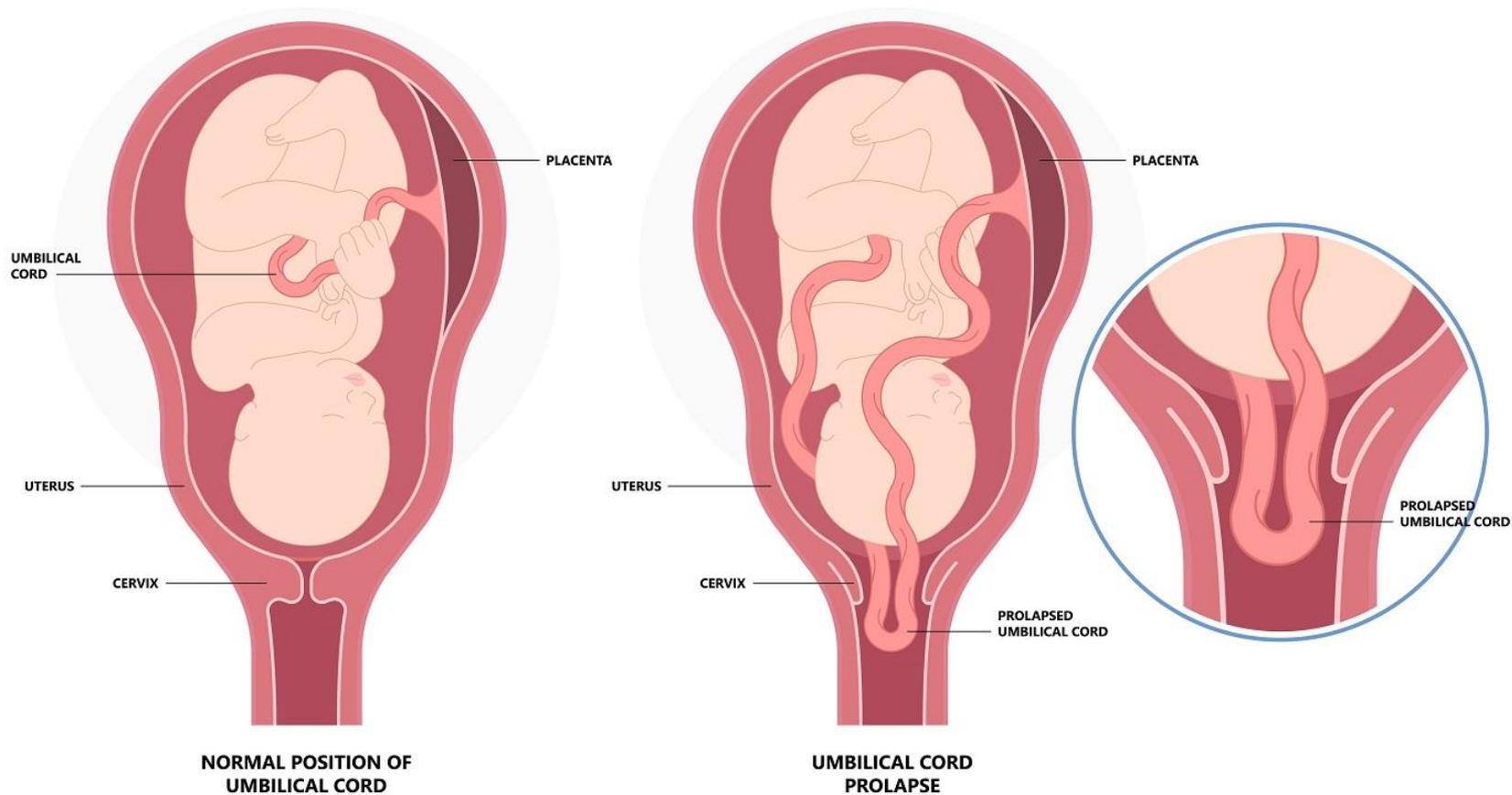
Cord Prolapse

Definition

The descent of the umbilical cord alongside or beyond the presenting part **with ruptured fetal membranes**. It is an obstetric emergency.

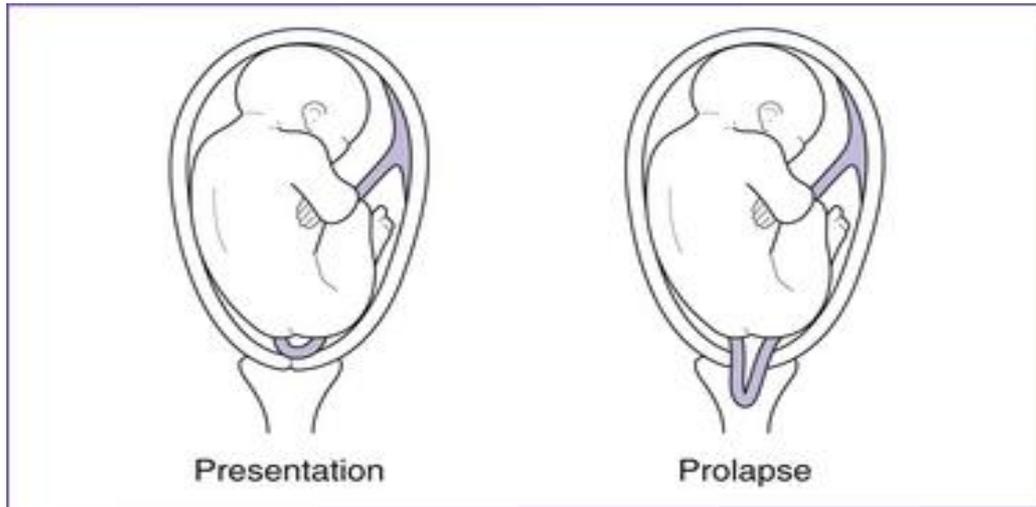
Ruptured fetal membranes is a **must** for the definition of cord prolapse. If the membranes are not ruptured, then this is called cord presentation not prolapse

UMBILICAL CORD PROLAPSE



Cord Prolapse Presentation:

Intact membranes with the cord descending below the presenting part. Cord can be palpated through the intact membranes, harbinger of cord prolapse

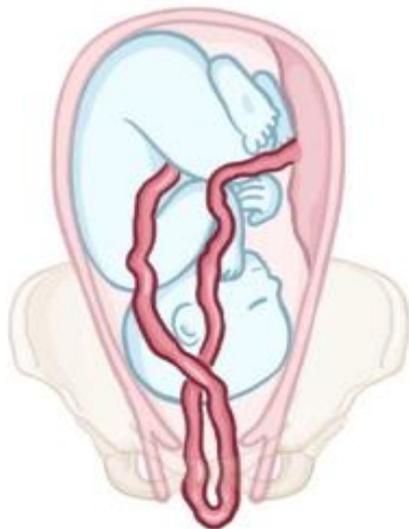


Classifications

- **Occult cord prolapse:** Ruptured membranes with descent of cord adjacent to the presenting part (no matter whether it is head" vertex", buttocks" breech" etc...). The cord can't be palpated by PV exam and can't be seen on speculum examination.
- **Overt cord prolapse:** Ruptured membranes with descent of cord below the presenting part

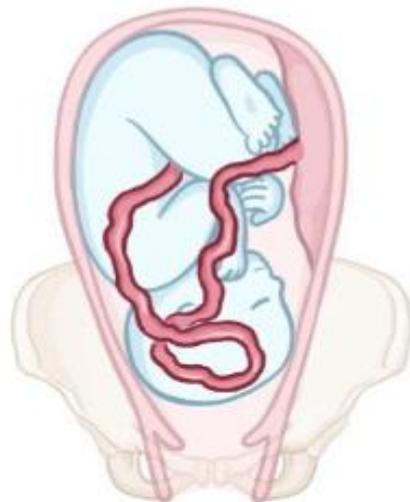
OVERT PROLAPSE

UMBILICAL CORD AHEAD of FETAL PRESENTING PART



OCCULT PROLAPSE

UMBILICAL CORD ALONGSIDE FETAL PRESENTING PART

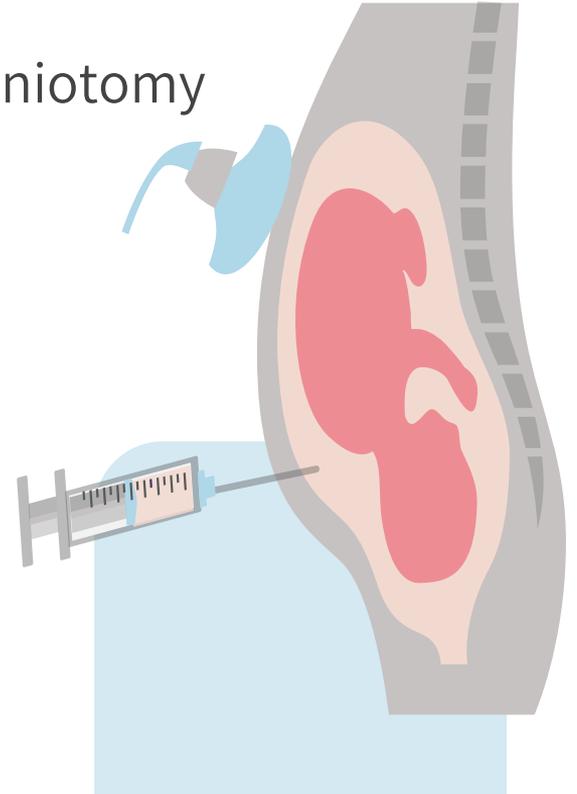


FETUS COMPRESSES UMBILICAL CORD

↳ ↓ BLOOD & O₂ to FETUS

Risk Factors

- Spontaneous rupture of membranes
- Iatrogenic rupture of membrane: via amniotomy
- Fetal congenital anomalies
- Multiple gestation
- External cephalic version
- Placement of internal monitors
- Prematurity
- IUGR
- Abnormal fetal lie or presentation
- Pelvic tumors



Pathology

Normally The umbilical cord carries fetal blood into the placenta to be oxygenated

Cord prolapse means the cut-off of fetal blood into and back from the placenta > decreased supply of oxygenated blood into the fetus > fetal **hypoxia** and acidosis.

Clinical Presentation and Diagnosis

The earliest sign is **sudden, severe, prolonged fetal bradycardia**.

Variable decelerations may also show

In occult cord prolapse, in which there is no visualized or palpable cord, **variable deceleration** is the only presenting sign.

You suspect occult cord prolapse based on the pathological CT findings and confirm it on C-section.

Direct visualization or palpation of cord > confirmed diagnosis of overt cord prolapse

The diagnosis of cord prolapse is a clinical one!!

Differential Diagnosis

Direct visualization or palpation of the cord eliminates any differentials and confirms cord prolapse.

If cord prolapse is **occult**, other differentials causing **fetal distress and bradycardia** may be considered.

Management

- Call for help!
- Assess fetal viability by continuous fetal monitoring
- Try to stabilize fetus by administering oxygen to mother via mask
- Establish IV access in preparation for emergency C-section
- Fetus dead: Manage as in utero fetal demise, you go for the safest delivery for the mother (either spontaneous or induced)
- Fetus alive: Perform basic measures for reducing hypoxia
- Check if cervix is fully dilated

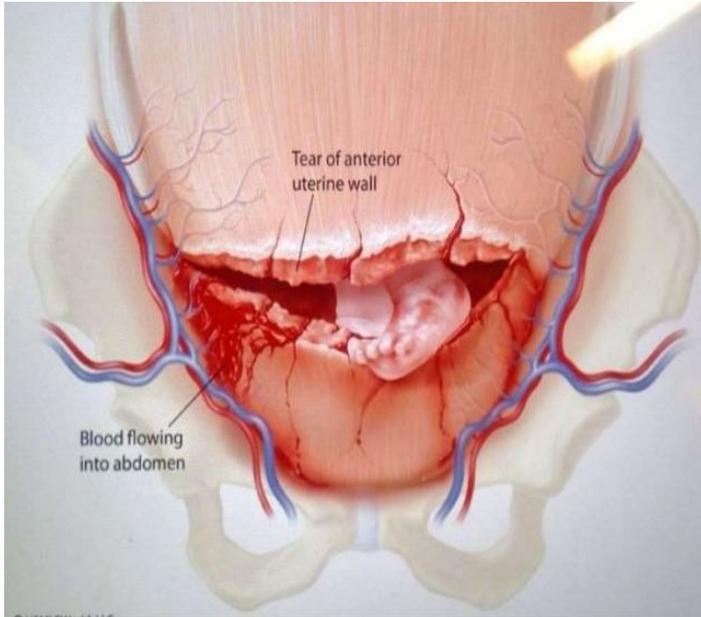


Complications

- Fetal hypoxia and its sequelae like cerebral palsy and neurodevelopmental delay
- Fetal death
- Caesarean section surgical complications



03



Uterine Rupture

Uterine Rupture

Definition

- full thickness loss of integrity of the uterine wall and visceral peritoneum.

Etiology :

- Uterine distention (Fetal macrosomia and multiple gestations).
- **Uterine scar**/prior uterine surgery (e.g., cesarean delivery or myomectomy).
- Traumatic rupture (e.g., iatrogenic or caused by an accident)
- Other risk factors (Delay in labor progression because of fetal malpresentation , Overdose of oxytocin , high parity , uterine abnormalities)



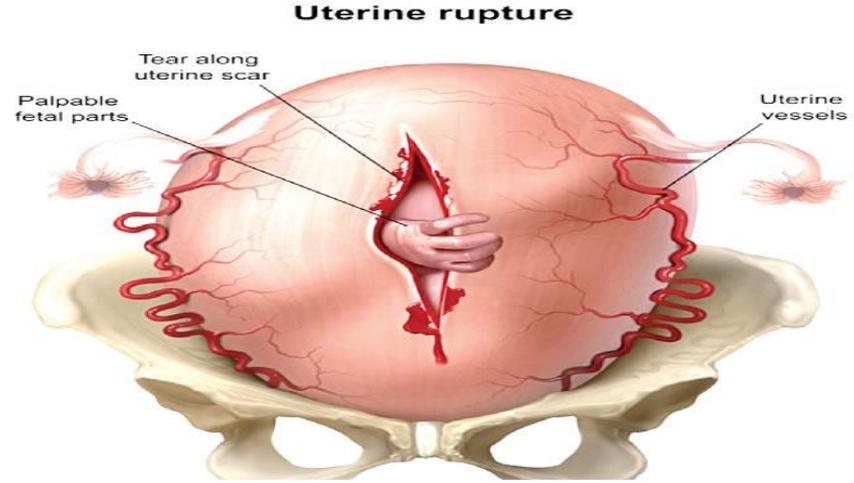
Uterine Rupture

Signs and Symptoms:

- Abdominal pain between uterine contractions
- Bleeding
- Loss of station
- Inability to identify uterine contractions
- Hematuria and blood stained liquor
- CTG abnormalities and fetal distress .

Diagnosis:

- Uterine rupture is **clinical diagnosis** based on signs of imminent uterine rupture and other signs of uterine rupture.

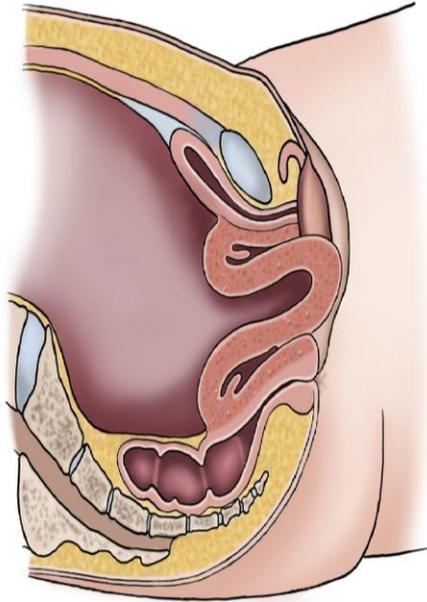


Uterine Rupture

Management :

- ABCDE approach and immediate hemodynamic support.
- Avoid uterotonic agents.
- Consider hysterectomy for refractory hemorrhage.
- Uterine repair

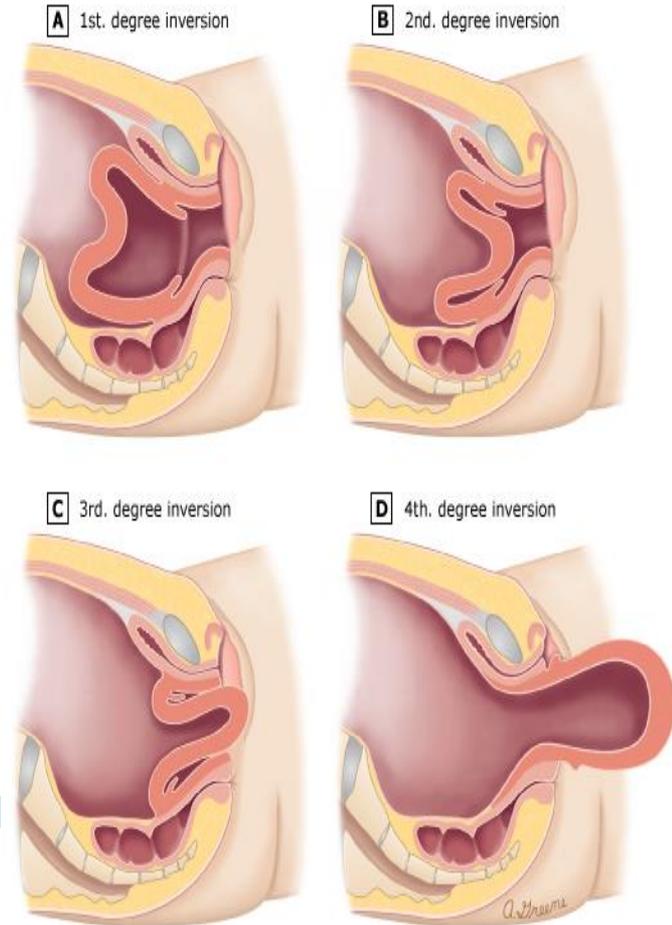
04



Uterine Inversion

Uterine Inversion

- Uterine inversion is the “turning inside out” of the uterus in the third stage of labor. with the top of the uterine fundus extending through the cervix into the vagina and sometimes even past the introitus .
- It is quite rare, occurring in only about 1 in 20,000 pregnancies.
- **Etiology** : Improper management of the third stage of labor in which the inexperienced physician exerts fundal pressure while pulling on the umbilical cord before complete placental separation, uterine inversion may occur.
- As the fundus of the uterus moves through the vagina, the inversion exerts traction on peritoneal structures, which can elicit a profound vasovagal response. The resulting vasodilation increases bleeding and the risk of hypovolemic shock. If the placenta is completely or partially separated, the uterine atony may cause profuse bleeding, which compounds the vasovagal shock.



Risk Factors

- Strong traction on umbilical cord with excessive fundal pressure.
- Abnormal adherence of the placenta.
- Uterine anomalies.
- Short cord.
- Previous uterine inversion.
- Use of uterine muscle relaxants during the antepartum period (e.g., MgSO₄)
- Prolonged delivery



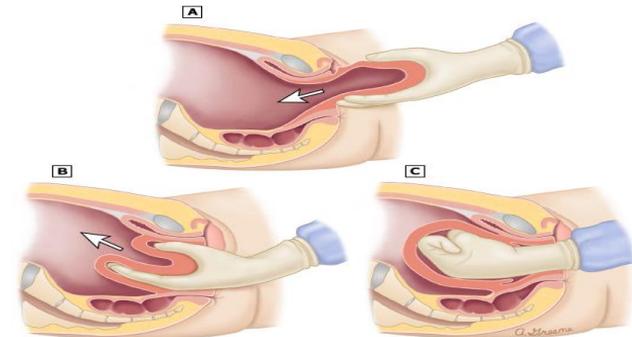
Figure 2 Intraoperative finding showing uterine inversion w

Clinical Features :

- Brisk postpartum hemorrhage.
- Lower abdominal pain.
- Round mass (inverted uterus) protruding from the cervix or vagina.
- Absent fundus (top of the uterus) at the periumbilical position during transabdominal palpation.
- Shock out of proportion to the blood loss (neurogenic, due to increased vagal tone).
- Mass in the vagina on VE.

Management:

- The patient rapidly goes into shock, and immediate intravascular volume expansion with IV crystalloids is required.
- replace the uterus by placing a cupped hand into the inverted fundus from below and elevating it in the long axis of the vagina.
- If this is unsuccessful, a further attempt should be made using IV nitroglycerin (100 µg) or general anesthesia to relax the uterine muscle. Once replaced, a dilute infusion of oxytocin should be started to cause the uterus to contract before removing the intrauterine hand.
- Rarely, the uterus cannot be replaced from below, and a surgical procedure may be required.



05

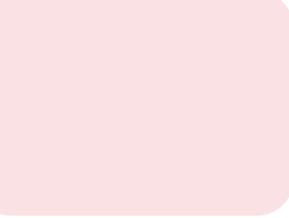
Definition:

Characterized by cardiorespiratory compromise and altered consciousness. It is rare in pregnancy.

Maternal Collapse

Table 35.2**Causes of Maternal Collapse (the 6 Hs)**

<i>Head</i>	Eclampsia Epilepsy Cerebrovascular event Intracranial haemorrhage Vasovagal response
<i>Heart</i>	Myocardial infarction Arrhythmias Peripartum cardiomyopathy Congenital heart disease Dissection of thoracic aorta
<i>Hypoxia</i>	Asthma Pulmonary embolism Pulmonary oedema Anaphylaxis
<i>Haemorrhage</i>	Abruption Uterine atony Genital tract trauma Uterine rupture Uterine inversion Ruptured aneurysm
<i>wHole body and Hazards</i>	Hypoglycaemia Amniotic fluid embolism Septicaemia Trauma Complications of anaesthesia Anaphylaxis

- 
- Prevention should be the primary objective, which starts with risk stratification. A thorough antenatal assessment should be performed to identify women at risk and then strategies for mitigation should be implemented.
 - Obstetric-specific early warning charts for recording systemic observations facilitate early identification of deterioration and promote communication and escalation, which may result in interventions that prevent deterioration to the point of collapse.
 - The care of women with maternal collapse must account for the anatomical and physiological changes of pregnancy.

Pregnancy-Specific Considerations in Maternal Collapse

1. After 20 weeks' gestation, the gravid uterus may compress the aorta and vena cava in the supine woman, limiting venous return and resulting in reduced cardiac output.
2. Progesterone causes relaxation of the oesophageal-gastric junction, increasing the risk of aspiration of acidic stomach contents and chemical pneumonitis (Mendelson syndrome).
3. Difficult endotracheal intubation is more common in pregnancy.
4. Changes in lung function, including diaphragmatic splinting and increased oxygen consumption, mean that pregnant women may become hypoxic more readily and can be more difficult to oxygenate.

Care of Women with Maternal Collapse

1. Initial management of maternal collapse should follow resuscitation guidelines.
2. Call for help!
3. Assess for signs of life
4. Adopt an ABCE approach:

Care of Women with Maternal Collapse

➤ **A – Airway:**

Open the airway if compromised (chin lift or jaw thrust).

In cases of cardiac arrest, intubation should be undertaken as soon as possible by an experienced anaesthetist.

Use of cricoid pressure during intubation may reduce the risk of aspiration.

➤ **B – Breathing:**

Apply high-flow oxygen 15 L/min.

A pulse oximeter should be applied for monitoring oxygen saturations.

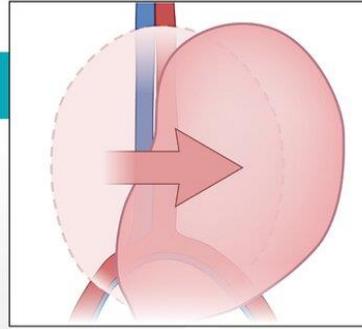
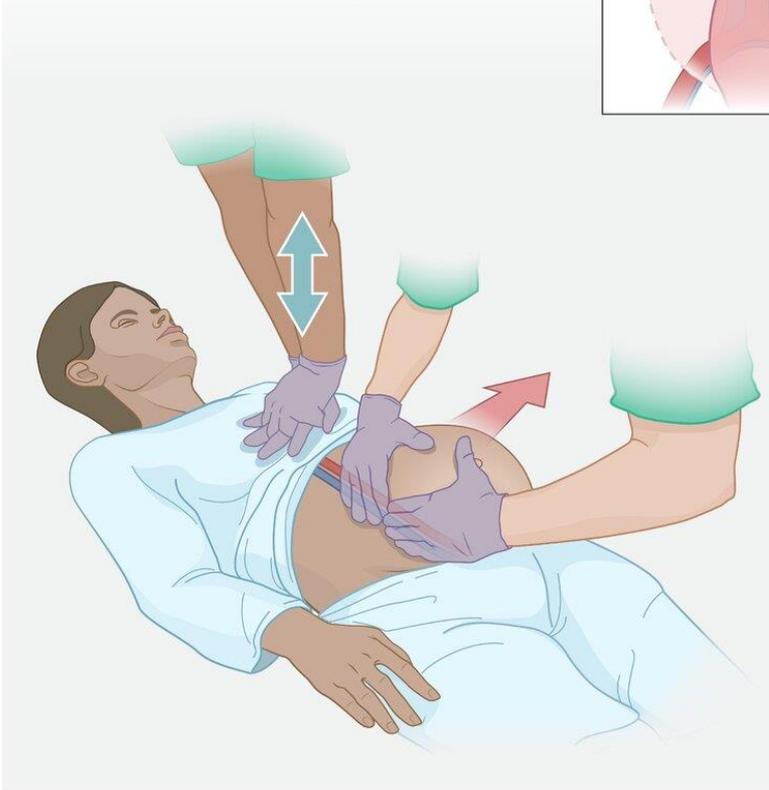
Care of Women with Maternal Collapse

C – Circulation:

- Assess heart rate, blood pressure, and capillary refill.
- Secure large-bore IV access.
- An initial blood screen should include a full blood count, urea and electrolytes, liver function test, clotting, blood group and screen, and venous blood gas.
- Fluid resuscitation – initial stat 500-mL bolus of crystalloids, for example, 0.9% sodium chloride, except when the suspected diagnosis is fluid overload
- Manual displacement of the uterus to the left should be performed (if >20 weeks' gestation) to reduce aortocaval compression.

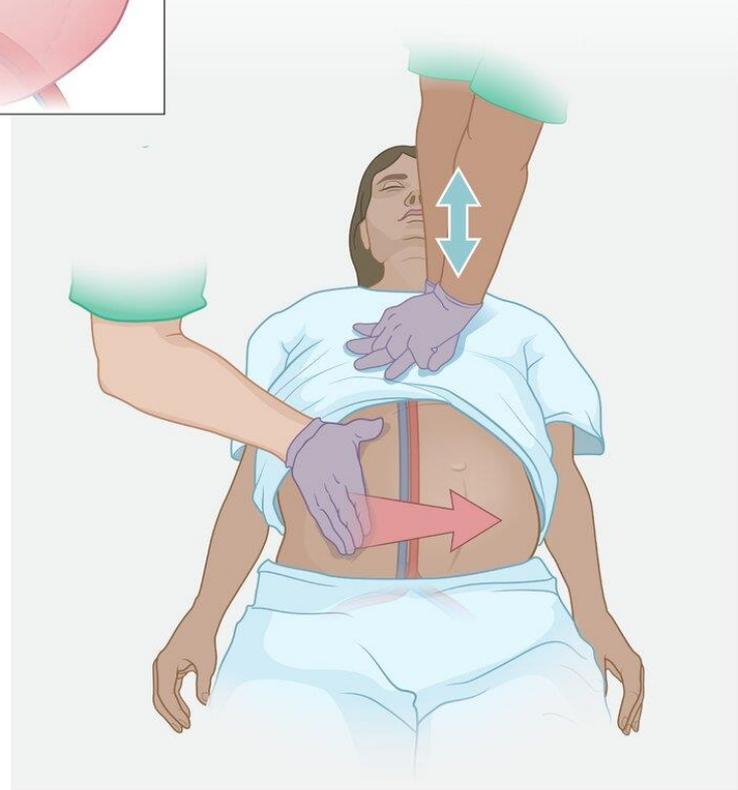
Two-handed displacement

- Pull the gravid uterus off the aorta and IVC
- Performed from the left side of the bed



One-handed displacement

- Push the gravid uterus off the aorta and IVC
- Performed from the right side of the bed

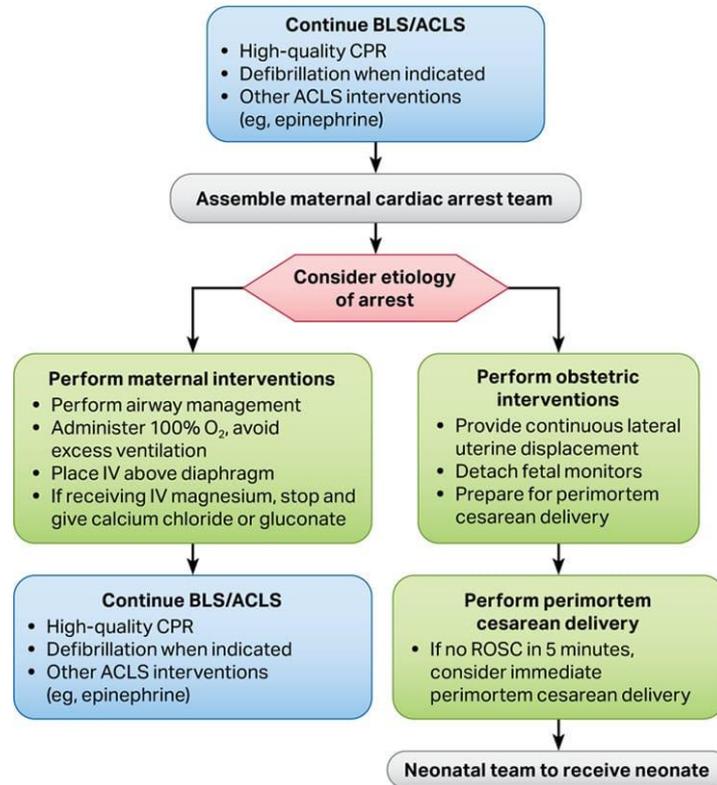


Care of Women with Maternal Collapse

E – Exposure:

- Check temperature.
- Inspect for evidence of bleeding, including suspecting occult bleeding.
- Examine the abdomen, palpate the uterus and perform a speculum or vaginal examination when there is evidence of vaginal bleeding.

Cardiac Arrest in Pregnancy In-Hospital ACLS Algorithm



Maternal Cardiac Arrest

- Team planning should be done in collaboration with the obstetric, neonatal, emergency, anesthesiology, intensive care, and cardiac arrest services.
- Priorities for pregnant women in cardiac arrest should include provision of high-quality CPR and relief of aortocaval compression with lateral uterine displacement.
- The goal of perimortem cesarean delivery is to improve maternal and fetal outcomes.
- Ideally, perform perimortem cesarean delivery in 5 minutes, depending on provider resources and skill sets.

Advanced Airway

- In pregnancy, a difficult airway is common. Use the most experienced provider.
- Provide endotracheal intubation or supraglottic advanced airway.
- Perform waveform capnography or capnometry to confirm and monitor ET tube placement.
- Once advanced airway is in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions.

Potential Etiology of Maternal Cardiac Arrest

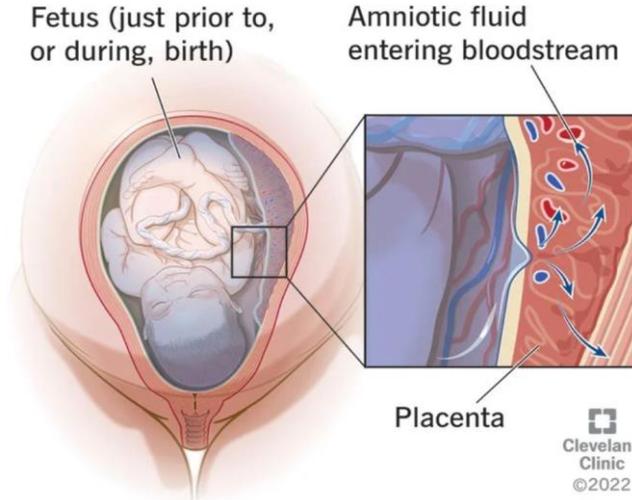
- A** Anesthetic complications
- B** Bleeding
- C** Cardiovascular
- D** Drugs
- E** Embolic
- F** Fever
- G** General nonobstetric causes of cardiac arrest (H's and T's)
- H** Hypertension

06

Amniotic Fluid Embolism

Amniotic fluid embolism

Anaphylactic syndrome of pregnancy



Definition

A rare life-threatening condition caused by the entry of fetal cells and debris (from amniotic fluid) into maternal circulation

Clinical Features

AFE typically manifests during labor or immediately after delivery but can occur up to 48 hours postpartum

- Acute respiratory distress syndrome
- Dyspnea, tachypnea, cough
- Hypoxia, cyanosis
- Basal crepitations
- Cardiovascular collapse: hypotension, arrhythmias, cardiac arrest
- Neurological symptoms: altered mental status, seizures
- Clinical features of disseminated intravascular coagulation (DIC)
- Multiorgan dysfunction
- Nonspecific symptoms (e.g., anxiety, a sense of impending doom)
- Fetal distress: decelerations on cardiotocography

Risk factors

- Maternal age > 30 years
 - Multiparity
 - Complicated labor (e.g., placenta previa/abruption, forceps delivery, cesarean delivery, eclampsia)
 - Invasive procedures (e.g., amniocentesis, abortion)
 - Blunt abdominal trauma
-

Diagnosis

General principles

AFE is a clinical diagnosis based on the sudden onset of typical peripartum clinical features.

Supportive studies are used to help guide management and rule out complications.

If AFE is suspected clinically, do not delay treatment to obtain diagnostic studies.

Laboratory studies

Arterial blood gas analysis: hypoxemia, acid-base disorders

CBC: anemia, thrombocytopenia

Coagulation studies: \uparrow aPTT, \uparrow PT, \downarrow fibrinogen

Pulmonary artery blood sample: presence of squamous cells, hair, or other fetal debris in maternal blood

Management

AFE is a life-threatening condition and must be treated as an emergency.

ABCDE survey

Respiratory support and immediate hemodynamic support as needed.
Prepare for emergency delivery.

Management of cardiac arrest in pregnancy

Initiate CPR.
Perform left uterine displacement.
Consider perimortem cesarean delivery if indicated.

Treatment of DIC

Manage refractory uterine bleeding.

Prognosis

Case fatality for women with AFE has improved from 80% to around 20% but long-term neurological sequelae have been reported in surviving women.

Outcomes for the fetus (if AFE occurs prior to birth) are similarly poor, with a reported 60% perinatal mortality.