Reviewed By
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Video Case

Intrauterine Fetal Death (IUFD)

Objectives:

- → Define IUGR.
- → Describe maternal, placental, and fetal causes of fetal growth restriction.
- → List methods of detection of fetal growth restriction.
- → Describe the prevention and management of fetal growth restriction.
- → Describe the symptoms and common causes of fetal demise in each trimester including genetic and nutritional factors
- → Describe the diagnostic methods to confirm the diagnosis and etiology of fetal demise
- → Describe the medical and psychosocial management of a patient diagnosed with a fetal demise.
- → Outline the steps to disclose a diagnosis of fetal demise to a patient.
- → Identify factors unique to developing countries that may lead to fetal demise.

- → Slides
- → Important
- → Golden notes
- → Extra
- → 439 Doctor's notes
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- → 441 Female Presentation
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Editing File

Intrauterine Fetal Death

Overview:

→ Intrauterine fetal demise (IUFD/stillbirth/stillborn/fetal death) is fetal death after 20 weeks gestation and the onset of labor.
→ If the gestational age is inaccurate or not determined; a birthweight of >500 gram constitutes as IUFD.
→ IUFD complicates about 1% of pregnancies.
→ The **cause** of IUFD is either **not known or cannot be determined in more than 50% of the cases**.

Antenatal demise	Occurs **before labor**.
Spontaneous abortion	Pregnancy **loss** occurring **before 20 weeks gestation**.
Intrapartum death	Fetal **death** from the **onset of labor to birth**.
Perinatal death	Encompasses fetal **death from 20 weeks gestation to 28 days after birth.**
Neonatal death	Newborn **death** between **birth and the first 28 days of life.**
Infant death	**Between birth and the first year of life**.
Maternal death	The **mothers death** either during pregnancy or **within 90 days of birth**.

Significance:

→ Disseminated intravascular coagulation (**DIC**) High PT & PTT Low Fibrinogen & PLT.is the most serious consequence, with prolonged fetal demise (>2 weeks) resulting from release of tissue **thromboplastin** from deteriorating fetal organs.
→ Grief resolution may be prolonged if psychosocial issues are not appropriately addressed.

Presentation:

→ In many cases there are no signs and/or symptoms (The most common presentation of fetal death).
→ Mother reports absence of fetal movements (most common presentation >20w of gestation)
→ Uterus smaller than expected of date (most common presentation <20w of gestation)
→ Absence or decrease in pregnancy-related symptoms including nausea
→ **Fetal heart tone not detected using doppler device** we use doptone to hear fetal heart.
→ Possible bleeding, cramping and/or labor

Intrauterine Fetal Death

Diagnosis

→ Real-time ultrasonography confirming the **lack of fetal movement and absence of fetal cardiac activity is used for diagnosis**. US is the most definitive way to confirm.
→ 2 doctors must confirm the diagnosis before disclosing the death to the mother.
→ No point in measuring β-HCG as it will still be produced by the placenta.

Risk factors ★

→ Fetal demise is most commonly idiopathic (50%), and the chance of recurrence if it was idiopathic is <1%.
→ When a cause is identified, risk factors include:

Antiphospholipid syndrome	**Overt maternal diabetes**	**Maternal trauma**	**Severe maternal isoimmunization**	**Fetal infection**
Fetal aneuploidy	Fetal infection	Non-hispanic black race	Advanced maternal age	
Smoking	**Poor nutritional status**	**Nulliparity**	Obesity	Male fetus
Multiple gestations (monochorionic subtype)	No access to clinic	Low SES and education	History of: IUFD, preterm delivery, IUGR , preeclampsia in a prior pregnancy	

Causes and associated conditions :

Maternal	Placental	Fetal	Global
→ **Advanced age** → Overt **diabetes** → **Preeclampsia** and **eclampsia** → **Antiphospholipid syndrome (APS)** → Chronic HTN → Thrombophilias → **SLE** → Renal disease → Thyroid disorders → Cholestasis of pregnancy → sickle cell disease → **Infections**: syphilis, listeria, human parvovirus B19, malaria, CMV, TORCH	→ Placental abnormalities: **A. Placenta succenturiata** **B. Placenta velamentosa** **C. Vasa previa** → **Placental abruption**: it's the most common single identifiable cause of IUFD (10%-20%)	→ Cord accident → **Hydrops fetalis**: A. Immunogenic (Rh incompatibility) B. Non-immunogenic: infection (parvovirus B19) or chromosomal (α-thalassemia) → **Fetal chromosomal, genetic, and structural abnormalities** (it's true but usually they present as miscarriage) → IUGR → Fetomaternal hemorrhage	→ Malaria → Poverty (Poor nutrition) → Sickle cell disease

Intrauterine Fetal Death

Management:

Watchful expectancy	→ About 80% of patients experience the spontaneous onset of labor within 2 to 3 weeks of fetal demise. → If she'd like to keep her baby and wait for spontaneous delivery then let her do that, but weekly follow up is a must, in addition to DIC investigation. → Most of the patients will **deliver spontaneously**.
Workup	→ Weekly levels of fibrinogen, hematocrit, and platelets should be monitored during the period of expectant management. → Decreasing fibrinogen levels and increasing PT/PTT, presence of fibrinogen-fibrin degradation products, and a decreased platelet count may indicate consumptive coagulopathy. → If there is evidence of bleeding, blood volume support or fresh frozen plasma should be given before any intervention is made.
Induction of labor (IOL)	→ Indications for induction of labor: mother's request, risk of chorioamnionitis or IUFD >5 weeks **From week 12-28: (20 weeks)** → Unfavorable Cx. **vaginal suppositories of prostaglandin E2 (dinoprostone)** → **Dinoprostone** usage is contraindicated in → patients with **prior uterine incisions** because of it's risk. → patients with history of **asthma or active pulmonary disease**. → **Misoprostol** (Cytotec) **After week 28:** → **If the cervix is favorable: cytotec followed by oxytocin are the drugs of choice**. → Evacuation of the uterus may be performed by D&E versus induction of labor depending on gestational age and patient preference. **Note: If the mother developed DIC (most serious complication) then she should deliver immediately (low platelets & fibrinogen, high D dimer, pT & pTT)**
Mode of delivery	→ A dilatation and evacuation (D&E) procedure may be appropriate in pregnancies of **<23** weeks' gestation if no fetal autopsy is indicated. → Induction of labor with vaginal prostaglandin is appropriate in pregnancies of **≥23** weeks or if a fetal autopsy is indicated. → **Cesarean delivery is almost never appropriate for dead fetus.**
Psychosocial issues	→ Acceptance of the reality of the loss may be enhanced by allowing the patient and her **family to see the fetus, hold the fetus, name the fetus, and have a burial.** → Encouraging expression of feelings and tears may speed grief resolution. → Don't put the patient in a postpartum ward, the last thing they wanna hear is infants cry. → She may develop depression in which you should consider SRRI's or a referral if needed. → If possible, it is best for all couples to know the cause of death of their child. → Couples must know the importance of follow-up in subsequent pregnancies (high risk pregnancy).

Intrauterine Fetal Death

Management:

Identify cause	**Workup may include:** → Complete history. → Full physical exam on **fetus + mother**. → Autopsy for suspected lethal anatomic syndrome. → Karyotype for suspected aneuploidy. → **total body x-ray** for suspected osteochondrodysplasia. MRI to check skeletal anomalies + fetal karyotyping (for anomalies/ small gestational age/ hydropes) → Maternal blood for Kleihauer-Betke (peripheral smear for suspected fetomaternal bleed). Predict the risk of preterm delivery after maternal trauma → **Amniocentesis** can yield living fetal amniocyte cells although the fetus is demised. → TORCH/parvovirus studies and cultures for listeria. (as well as syphilis, malaria, and CMV) → Cardiolipin antibodies should be tested in ALL women with IUFD. → Testing for hereditary thrombophilias should be considered. → **Urine toxicology screen** (to check drug and alcohol abuse) → **Placental inspection** the send for pathology assessment for (infection, thrombosis, malformation of the umbilical cord, abruption).

Teaching Case

A **30 year-old G1P0** woman presents for a routine prenatal visit at **36 weeks gestation**. Her prenatal course has been uncomplicated. She had a normal ultrasound at 20 weeks gestation with a normal fetal anatomic survey. She reports no problems and good fetal movement. Unfortunately, **no fetal heart tones** were heard by Doppler and an ultrasound evaluation confirmed **no fetal cardiac activity**. She is very upset and you spend time counseling her.

Q1: What is the definition of fetal demise?

IUFD/stillbirth is fetal death between 20 weeks gestation and the onset of labor. If the gestational age is inaccurate or not determined; a birthweight of >500 gram constitutes as IUFD.

Q2: What are the symptoms and physical Findings and diagnostic methods used to confirm the diagnosis of fetal demise?

→ History- physical exam- ultrasound as confirmatory test.
→ **In many cases there are no signs and/or symptoms.**
→ Decreased fetal movement could be a warning sign of IUFD less than 10 kicks per 12h.

01 Mother reports absence of fetal movements

02 Absence or decrease in pregnancy related symptoms including nausea.

03 Fetal heart tone not detected using Doppler device we use doptone to hear fetal heart

04 Possible bleeding, cramping and/or labor.

05 Real-time ultrasonography confirming the lack of fetal movement and absence of fetal cardiac activity is used for diagnosis.

Q3: What risk factors are associated with fetal demise?

Antiphospholipid syndrome	**overt maternal diabetes**	**maternal trauma**	**severe maternal isoimmunization**
fetal aneuploidy	fetal infection	Non-hispanic black race	Advanced maternal age
Multiple gestations	**Poor nutritional status**	**Nulliparity**	**Obesity**
Smoking	No access to clinic	Low SES and education	History of: IUFD, preterm delivery, IUGR , preeclampsia in a prior pregnancy

Q4: What are some causes and conditions associated with fetal demise?

Maternal	Placental	Fetal
→ Overt diabetes → Preeclampsia and eclampsia → Antiphospholipid syndrome (APS) → Chronic HTN → Thrombophilias → SLE → Renal disease → Thyroid disorders → Cholestasis of pregnancy → sickle cell disease → Infections: syphilis, listeria, human parvovirus B19, malaria, CMV, TORCH → RTA —>placental abruption → Poor nutritional status	→ Placental abnormalities: A. Placenta succenturiata B. Placenta velamentosa C. Vasa previa → Placental abruption	→ Cord accident → Hydrops fetalis: A. Immunogenic (Rh incompatibility) B. Non-immunogenic: infection (parvovirus B19) or chromosomal (α-thalassemia) → Fetal chromosomal, genetic, and structural abnormalities → IUGR → Fetomaternal hemorrhage Generally what to look for in fetus: congenital anomalies or signs of trauma

Q5: What work-up should be considered for a patient with a fetal demise?

→ Complete antenatal and family history
→ Screen for risk factors
→ Full physical exam on fetus.
→ Perform a physical exam on mother and obtain laboratory studies to rule out maternal conditions.
→ TORCH/parvovirus studies and cultures for listeria. (as well as syphilis, malaria, HIV and CMV)
→ Cardiolipin antibodies should be tested in ALL women with IUFD. If confirmed she had antiphospholipid syndrome then treat with heparin in the next pregnancy
→ Testing for hereditary thrombophilias should be considered.
→ Fetal-maternal hemorrhage screen (Kleihauer-Betke) to detect feto-maternal hemorrhage
→ Urine toxicology screen.
→ Chromosomal analysis.
→ Placental histopathology to know the cause especially in recurrent abortion.
→ Screen for DM,HTN,HPT etc..

Q6: How should a patient with a history of an unexplained fetal demise be followed in a future pregnancy?

- → Modify original etiological cause if possible.
- → Antenatal surveillance with Non Stress Tests, biophysical profiles beginning at approximately 32 weeks gestation or look for IUFD when it happened? and start 2 weeks before for the next pregnancy.
- → Delivery for those with history of IUFD should be at 38 weeks EGA.
- → Ultrasound surveillance to follow fetal growth.
- → Fetal kick counts at 26 week.
- → Frequent visits (give her open appointments) documentation of fetal heart tones and reassurance.

Q7: Describe the medical and psychosocial management of a patient diagnosed with a fetal demise.?

- → Confirm diagnosis (**By 2 Dr's**)
- → Disclose fetal death to the couple in appropriate manner
- → Offer the options of treatment to the patients either: immediate induction of labor/delivery or expectant management. Signs of bleeding requires either blood volume support or use of fresh-frozen plasma
  - → **Watchful Expectancy; watch and wait.** within 3 weeks Max. most of women will have spontaneous delivery but consider close monitoring to avoid complications
  - → Rare complications include intrauterine infection (chorioamnionitis) and maternal coagulopathy(DIC) High PT & PTT Low Fibrinogen & PLT.
  - → **Induction of Labor:**
    - → **From the 12th-28th week**: Unfavorable Cx. Vaginal suppositories of dinoprostone can be used. If dinoprostone PGE2is contraindicated(previous C-section) or is intolerable then give cytotec.
    - → **After 28 weeks gestation**, if the condition of the cervix is favorable for induction and there are no contraindications, Cytotec followed by oxytocin are the drugs of choice.
    - → Evacuation of the uterus may be performed by D&E versus induction of labor depending on gestational age and patient preference.
- → Regardless of the mode of delivery weekly levels of fibrinogen, hematocrit, platelets should be monitored during the period of expectant management to avoid consumptive coagulopathy or DIC
- → Localize etiological and disclose to the parents.
- → Psychosocial management: مهم جدًا
  - → Attempt to help families with their loss.
  - → Offer chance to hold the baby and keep mementos including photos/footprints
  - → Offer psychological counseling and visits with support groups.
- → Ensure subsequent pregnancies to be monitored closely.

Next pregnancy precautions:

- → Close & early follow up
- → Biophysical exam at 32 weeks
- → Frequent Ultrasound
- → Chromosomal testing
- → Anatomy scan
- → Control RFs
- → Fetal kick chart
- → Support

Reference

Intrauterine Fetal Demise

Intrauterine fetal demise (IUFD) is fetal death after 20 weeks' gestation but before the onset of labor. It complicates about 1% of pregnancies. With the development of newer diagnostic and therapeutic modalities, the management of IUFD has shifted from watchful expectancy to more active intervention.

ETIOLOGY

In more than 50% of cases, the etiology of antepartum fetal death is not known or cannot be determined. Associated causes include IUGR, hypertensive diseases of pregnancy, diabetes mellitus, erythroblastosis fetalis, umbilical cord accidents, fetal congenital anomalies, fetal or maternal infections, fetomaternal hemorrhage, antiphospholipid antibodies, and hereditary thrombophilias.

DIAGNOSIS

Clinically, fetal death should be suspected when the patient reports the absence of fetal movements, particularly if the uterus is small for dates, or if the fetal heart tones are not detected using a Doppler device. Because the placenta may continue to produce hCG, a positive pregnancy test does not exclude an IUFD.

Diagnostic confirmation has been greatly facilitated since the advent of ultrasonography. **Real-time ultrasonography confirms the lack of fetal movement and absence of fetal cardiac activity.**

MANAGEMENT

Fetal demise between 14 and 28 weeks allows for two different approaches: watchful expectancy and induction of labor.

Watchful Expectancy

About 80% of patients experience the spontaneous onset of labor within 2 to 3 weeks of fetal demise. The patient's feeling of personal loss and guilt may create significant anxiety, and this conservative approach may prove unacceptable. Thus, in general, the management of women who fail to go into labor spontaneously is active intervention by induction of labor or dilation and evacuation (D&E).

Induction of Labor

Justifications for such an intervention include the **emotional burden** of carrying a dead fetus on the patient, the slight possibility of **chorioamnionitis,** and the **10% risk of disseminated intravascular coagulation** when a dead fetus is retained for more than 5 weeks in the second or third trimesters.

Vaginal suppositories of prostaglandin E_2 (dinoprostone [Prostin E2]) can be used from the 12th to the 28th week of gestation. Dinoprostone is an effective drug with an overall success rate approaching 97%. Although at least 50% of patients receiving dinoprostone experience nausea and vomiting or diarrhea with temperature elevations, these side effects are transient and can be minimized with premedication (i.e., prochlorperazine [Compazine]). **There have been reported cases of uterine rupture and cervical lacerations,** but with properly selected patients, the drug is safe. The maximum recommended dose is a 20-mg suppository every 3 hours until delivery. **Dinoprostone usage in this range is contraindicated in patients with prior uterine incisions** (e.g., cesarean, myomectomy) because of the unacceptable risk of uterine rupture. Furthermore, prostaglandins are contraindicated in patients with a history of bronchial asthma or active pulmonary disease, although the E series act primarily as bronchodilators. **Misoprostol (Cytotec, a synthetic prostaglandin E_1 analogue)** vaginal tablets have been found to be quite effective with little or no gastrointestinal side effects, and they are less expensive than dinoprostone.

After 28 weeks' gestation, if the condition of the cervix is favorable for induction and there are no contraindications, Cytotec followed by oxytocin are the drugs of choice.

Monitoring of Coagulopathy

Regardless of the mode of therapy chosen, **weekly fibrinogen levels should be monitored during the period of expectant management, along with a hematocrit and platelet count.** If the fibrinogen level is decreasing, even a "normal" fibrinogen level of 300 mg/dL may be an early sign of consumptive coagulopathy in cases of fetal demise. An elevated prothrombin and partial thromboplastin time, the presence of fibrinogen-fibrin degradation products, and a decreased platelet count may clarify the diagnosis.

If laboratory evidence of mild disseminated intravascular coagulation is noted in the absence of bleeding, delivery by the most appropriate means is recommended. If the clotting defect is more severe or if there is evidence of bleeding, blood volume support or use of component therapy (fresh-frozen plasma) should be given before any intervention.

FOLLOW-UP

A search should be undertaken to determine the cause of the intrauterine death. **TORCH and parvovirus studies and cultures for *Listeria* are indicated.** In addition, **all women with a fetal demise should be tested for the presence of anticardiolipin antibodies. Testing for the hereditary thrombophilias should also be considered. If congenital abnormalities are detected, fetal chromosomal studies and total body radiographs should be done, in addition to a complete autopsy.** The autopsy report, when available, must be discussed in detail with both parents. In a stillborn fetus, the best tissue for a chromosomal analysis is the fascia lata, obtained from the lateral aspect of the thigh. The tissue can be stored in saline or Hanks solution. **A significant number of cases of IUFD are the result of fetomaternal hemorrhage,** which can be detected by identifying fetal erythrocytes in maternal blood **(Kleihauer-Betke test).**

The parents may experience feelings of guilt or anger, which may be magnified when there is an abnormal fetus or genetic defect. **Referral to a bereavement support group for counseling** is advisable.

Subsequent pregnancies in a woman with a history of IUFD must be managed as high-risk cases.

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