

MEDICINE, 2015.

Physiology and pathology of placenta, umbilical cord, amniotic fluid and membranes

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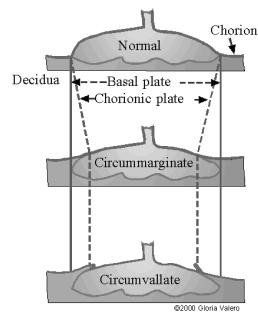
Placenta anomalies:

- shape anomalies
- anomalies of the placement
- implantation anomalies

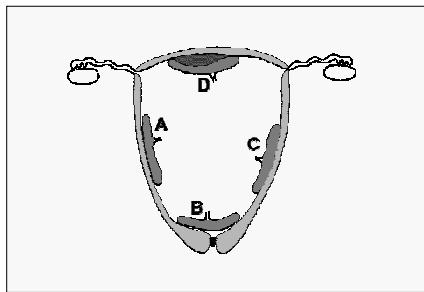
Placental shape anomalies

- placenta arcuata - horseshoe
- placenta anularis - ring
- placenta membranacea - thin and big
- placenta spuria -
- placenta extrachorialis - ~ 25% placenti; chorionic plate ↓ than basal:
 - placenta circumvalata
 - placenta circummarginata
- placenta diffusa - ...
- placenta fenestrata -
- placenta bilobata (1:350), trilobata, multilobata -.....
- placenta bipartita, tripartita, multipartita
- placenta succenturiata 38% of all placentas anomalies & 3% of all placentas

Placenta circumvalata



Placement anomalies



Placement anomalies



Placement anomalies

Placenta praevia

- placenta praevia primaria – the “wrong” place of implantation
- placenta praevia secundaria – the placental growth disturbance

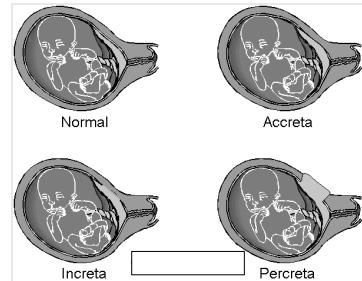
Placenta praevia - double the incidence of fetal anomalies!

Placement anomalies

- placenta praevia totalis – (20-30%)
- placenta praevia partialis – (20-35%)
- placenta praevia marginalis – (35-55%)

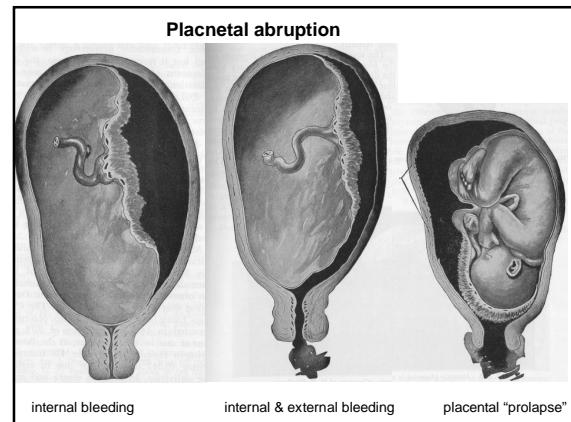
Implantation anomalies

- placenta adherens
- placenta accreta partialis seu totalis – resice u miometriju od kojeg su odvojene slojem fibrina
- placenta increta – nedostaje decidua pa su resice direktno u miometriju
- placenta percreta (destruens) – resice prožimaju cijeli miometrij

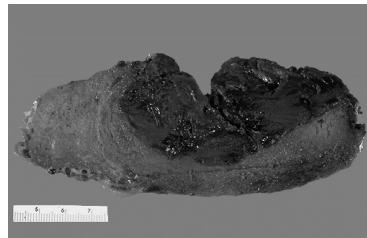
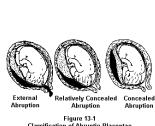


Placental abruption

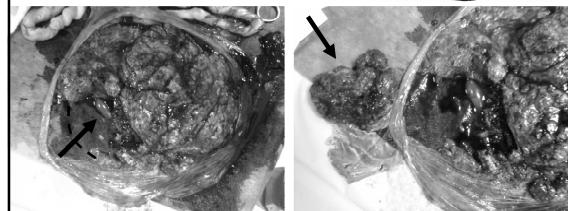
- premature detachment of normally inserted placenta from the uterine layer
- usually in the second half of pregnancy
- hipertonus, bleeding, sudden and sharp pain
- 20% of all bleeding in III. trimester
- hypertension, preeclampsia, smoking, previous abruption, multiparity, hidramnij, višeplodnost, IUGR, trauma, fetal abnormality, PPROM, SIAI (the most common cause of abruption II. trimester)
- Abruption ⇒ Disseminated Intravascular Coagulation – "DIK"



Placental abruption



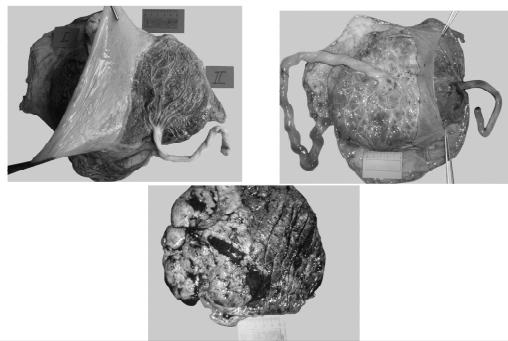
Placenta defecta



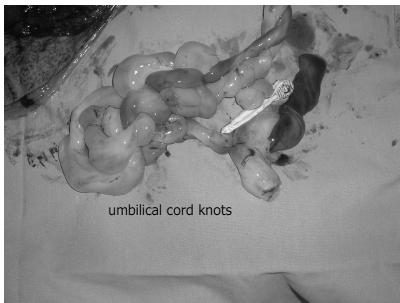
Intervention: Exploratio cavi uteri manualis

Placenta in twins

Gemini biamniati bichoriati



Gemini monoamniati monochoriat: 1-incidence 2%; perinatal mortality up to 50%



Gemini monochoriat twin to twin transfusion syndrome

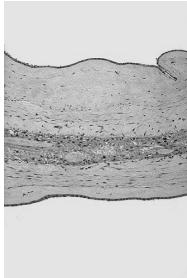


Gemini biamniati monochoriat, Graviditas hbd 30+5/7
Polyhydramnios et hydrops universalis gemini primi
Oligohydramnios et IUGR gemini secundi

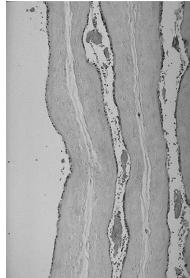
SC electiva: M/M 1990/39 i 970/35 ($PI_1 = 3,9 \text{ g/cm}^3$ $PI_2 = 2,26 \text{ g/cm}^3$)



Twins – chorionicity - septum

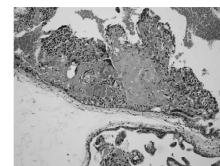


bichoriat



monochoriat

Gestational trophoblastic disease

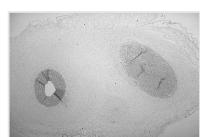


Umbilical cord



Umbilical cord

- 2 arteries & one vein
- lumen of the vein = 2 x lumen of the artery
- Wharton's jelly – the only example of the mucous tissue in humans (type of connective tissue)
- only amnion!



arteria umbilicalis una



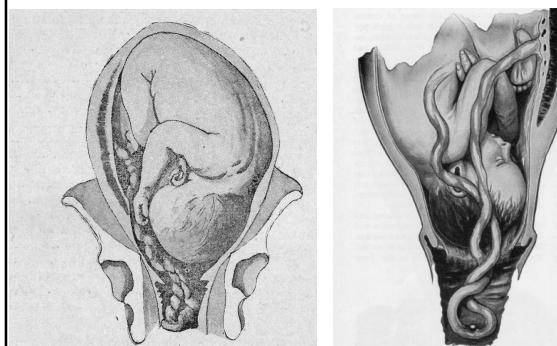
Umbilical cord knot



Double umbilical cord knot



Umbilical cord prolapse



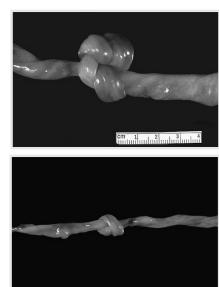
Umbilical cord & hand prolapse



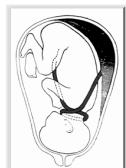
false knot
lat. nodus spurius



real knot
lat. nodus verus



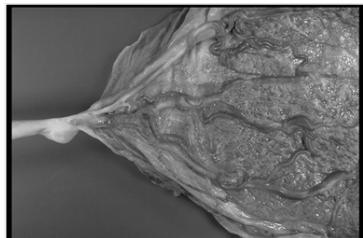
Funiculus umbilicalis circumcigens colo



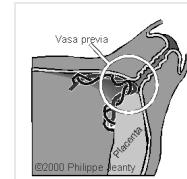
Insertio velamentosa funiculi umbilicalis

- umbilical cord ⇒ not attached directly to the placental plate
- attached to the membranes
- 1.1% to 8.7% singleton and twin placentas
- Associated anomalies are found in the 5.9 to 8.5% of the cases (esophageal atresia, spina bifida, VSD, single umbilical artery, placenta bilobata)
- sometimes with Sy. Down
- sometimes results with IUGR

Insertio velamentosa funniculi umbilicalis

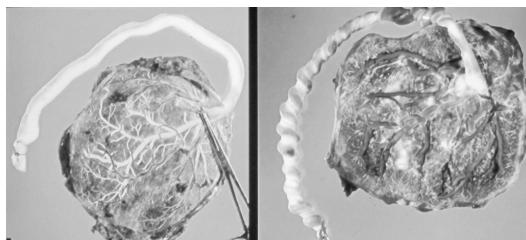


Vasa praevia



- 1: 5000 pregnancies
- connected with: insertio velamentosa funniculi umbilicalis, placenta bilobata, placenta succenturiata, placenta praevia marginalis, ...

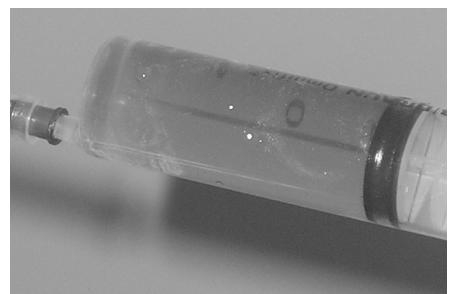
Umbilical cord torsion



Amniotic fluid

What is it for?

- mechanical protection
- proper distribution of the pressure force
- regulation of the temperature
- electrolyte and osmotic balance
- a reservoir of drinking water when is mother in hypovolemia
- "Source of fetal cells in ACZ"



Where does the maniotic water come?

- first ½ of pregnancy: dominant by transudation: Umbilical cord, membranes, the lining of the respiratory and digestive system of the fetus, fetal skin (no stratum corneum)
- a composition similar to fetal / maternal plasma
- second ½ of pregnancy: predominantly urinary system
- 25th weeks • 3.5 ml / hour
- 39 weeks • 25 ml / hour

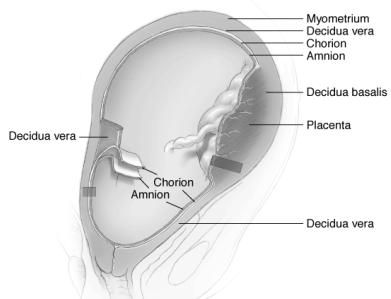


Amniotic fluid elimination ?

- ingestion - through the digestive tract of the fetus
- at 16 weeks swallowing 10ml/24 hours
- at 40 weeks fetus "consumes" 500 ml/24 hours
- swallowing during "breathing movements"
- through fetal membranes



Membranes



What is the amount of amniotic fluid?

- 10. weeks – 30ml
- 20. weeks – 350ml
- 30. weeks - 750 ml
- 36. – 38. weeks – 1000 ml
- iza 38. weeks ↓

Olygohidramnios

- Premature rupture of membranes
- Malformation of the urinary tract
- Ultrasound of the bladder (furosemide)
- Obstructive uropathy
- Renal agenesis (Sy. Potter)
- IUGR - brain sparing effect

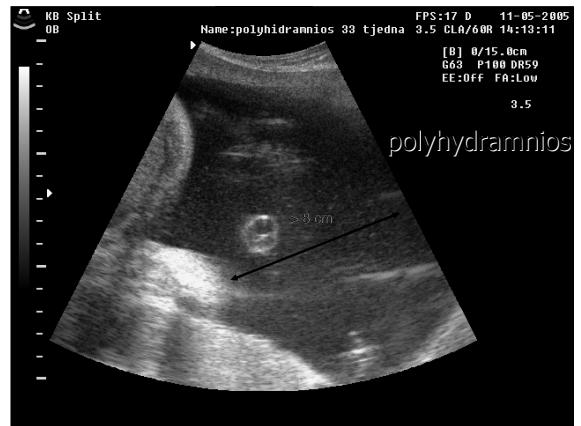
Polyhidramnios

- increased production (diabetes - metabolic disorders)
- difficult elimination (digestive system anomalies, CNS anomalies due to swallowing disorders, lung hypoplasia)
- infection (TORCH + parvo B19 virus)
- RH immunization
- twins (5-8%)
- placental tumors (chorioangioma)

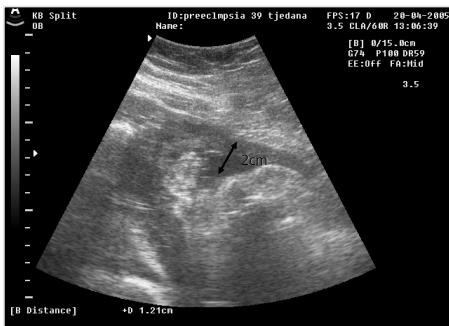
Amniotic fluid quantity estimation?



4a



oligohydramnios

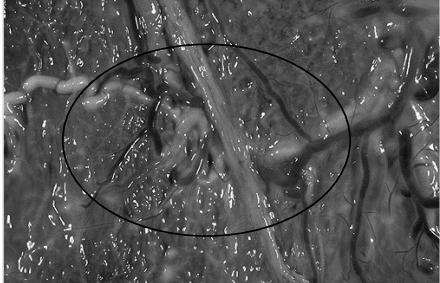


Twins, triplets,



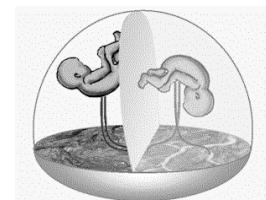
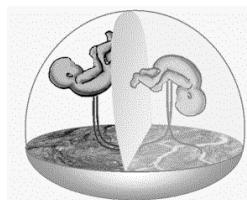
anastomosis

gemini biamnioti monochorati



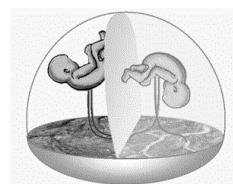
- "Vascular equator"

Twin to twin transfusion syndrome (TTTS) – (monochorionic twins)



Twin to twin transfusion syndrome
(TTTS) – (monochorionic twins)

fetus donor

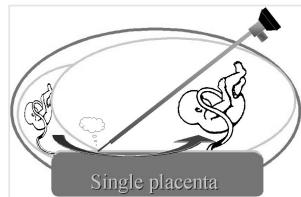


fetus akceptor

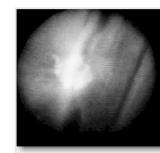
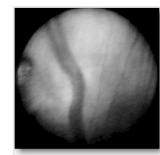
polyhydramnios

Twin to twin transfusion syndrome
(TTTS) – (monochorionic twins)

Laser



Laser bicornionisatia / St. post laser bicornionisationis



for the end

water after water