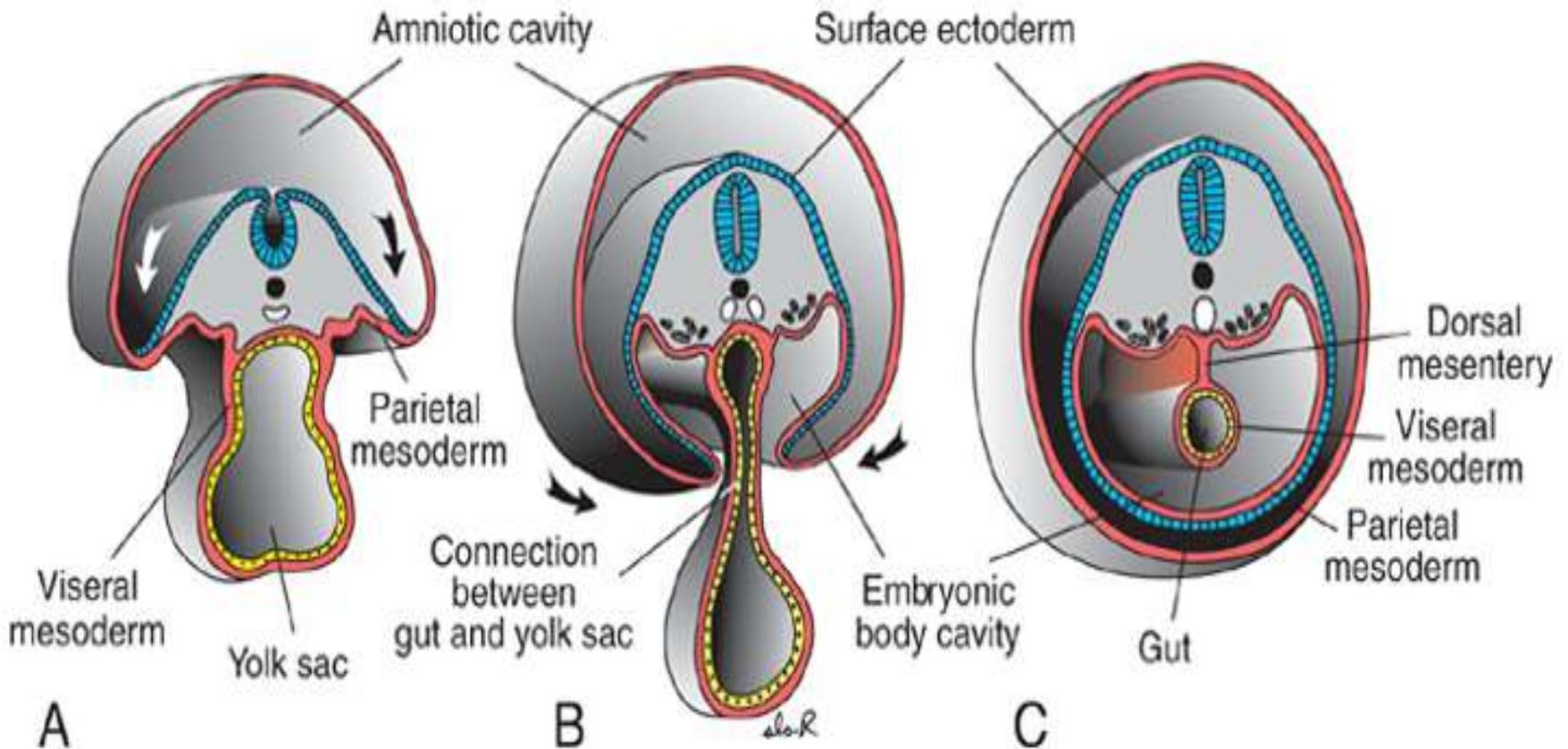
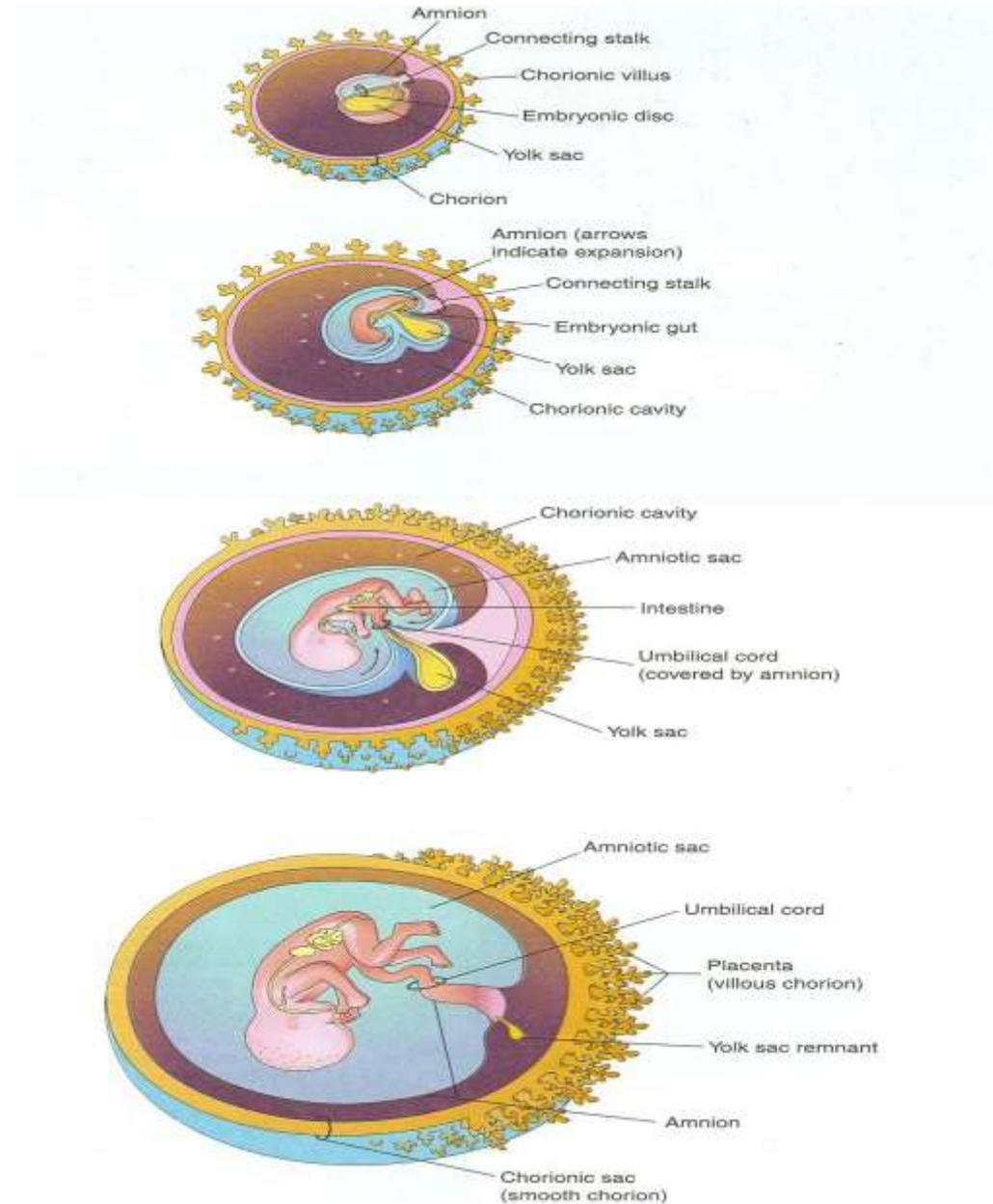


Yolk sac: it is a membranous sac attached to the embryo, convey nourishment to the embryo (e.g. in birds), in humans, Incorporate into the endoderm of embryo as a primordial gut and the primordial germ cells appear in the endodermal lining of the wall of the yolk sac in the 3rd week



- It is large at 32 days (at early development)
- by 10th week, regresses to 0.5 cm as a remnant structure which is connected to the midgut by a narrow yolk stalk
- at 20 weeks becomes very small, usually not visible thereafter.

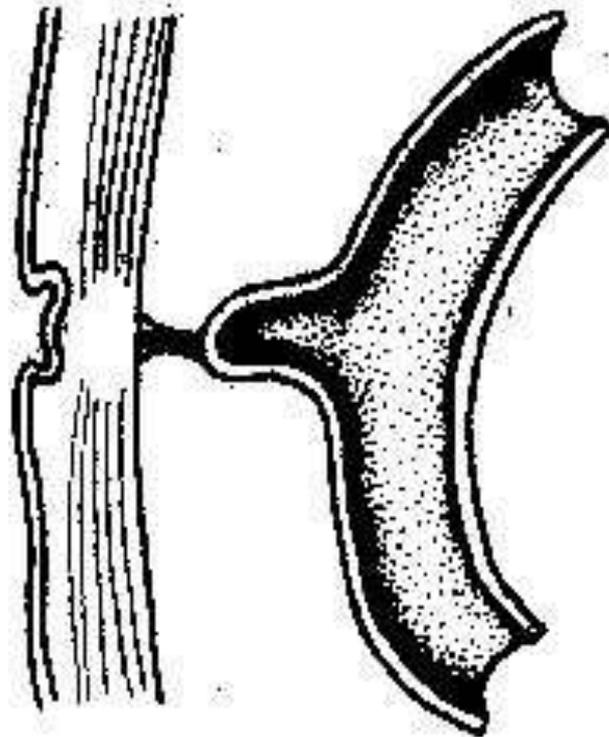


Abnormalities:

Sometimes it persists throughout the pregnancy but of no significance

In about 2% of adults the proximal intra-abdominal part of yolk stalk persists as an ileal diverticulum or Meckel diverticulum

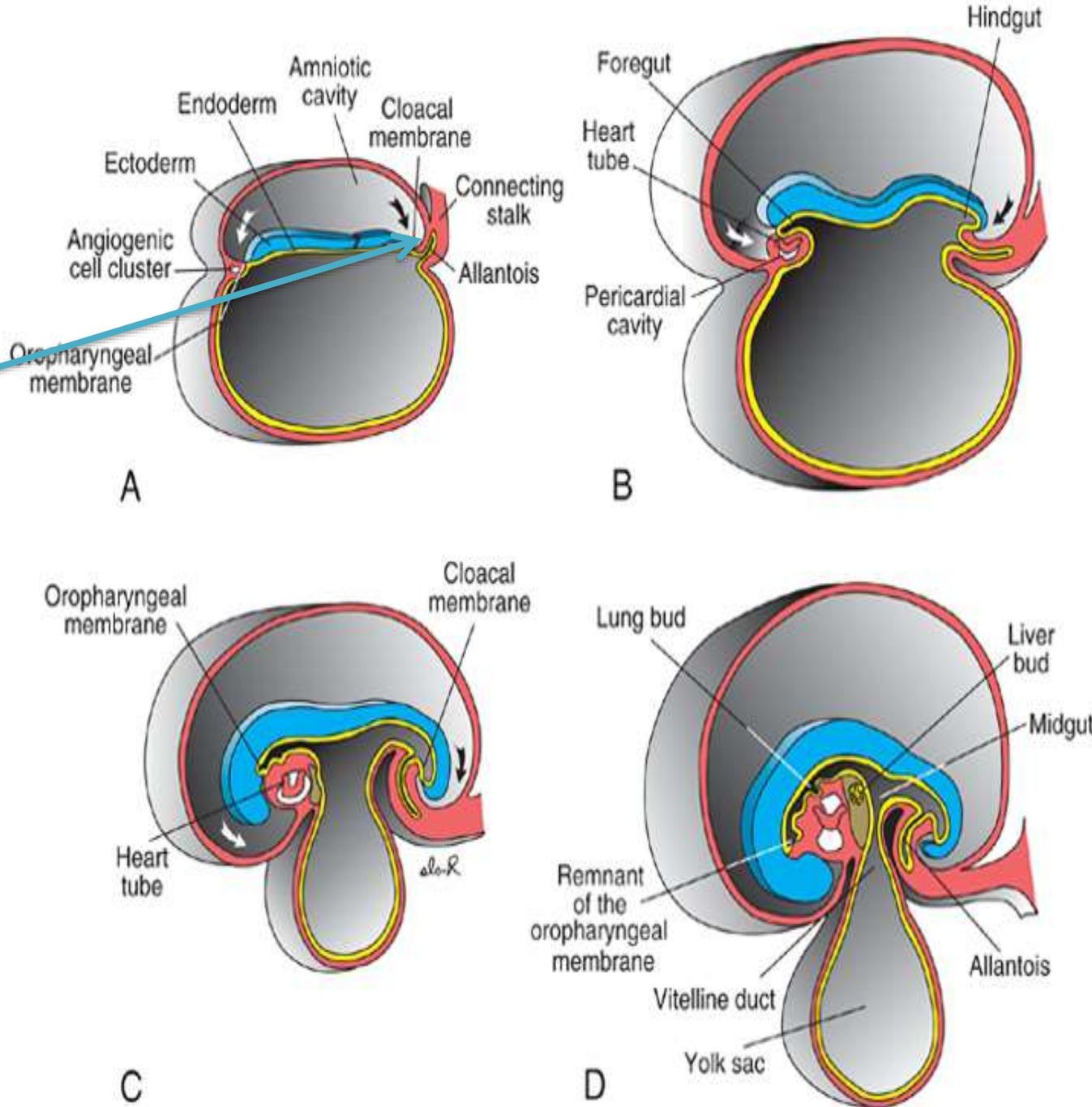
① Meckel's diverticulum



allantois, an extra-embryonic membrane of reptiles, birds, and mammals arising as a pouch, or sac, from the **hindgut**

In the 3rd week it appears as a tubular diverticulum from the caudal wall of yolk sac that extends into the connecting stalk

During the 2nd month, the extraembryonic part of the allantois degenerates



Functions of Allantois

Blood formation occurs in the wall during the 3rd to 5th week

Its blood vessels persist **as the umbilical vein and arteries**

Amniotic Fluid

The amniotic cavity is filled with a clear, watery fluid which is produced in part by amniotic cells but is derived primarily from maternal blood

The amount of fluid increases from approximately 30 ml at 10 weeks of gestation to 450 ml at 20 weeks to 800 to 1000 ml at 37 weeks

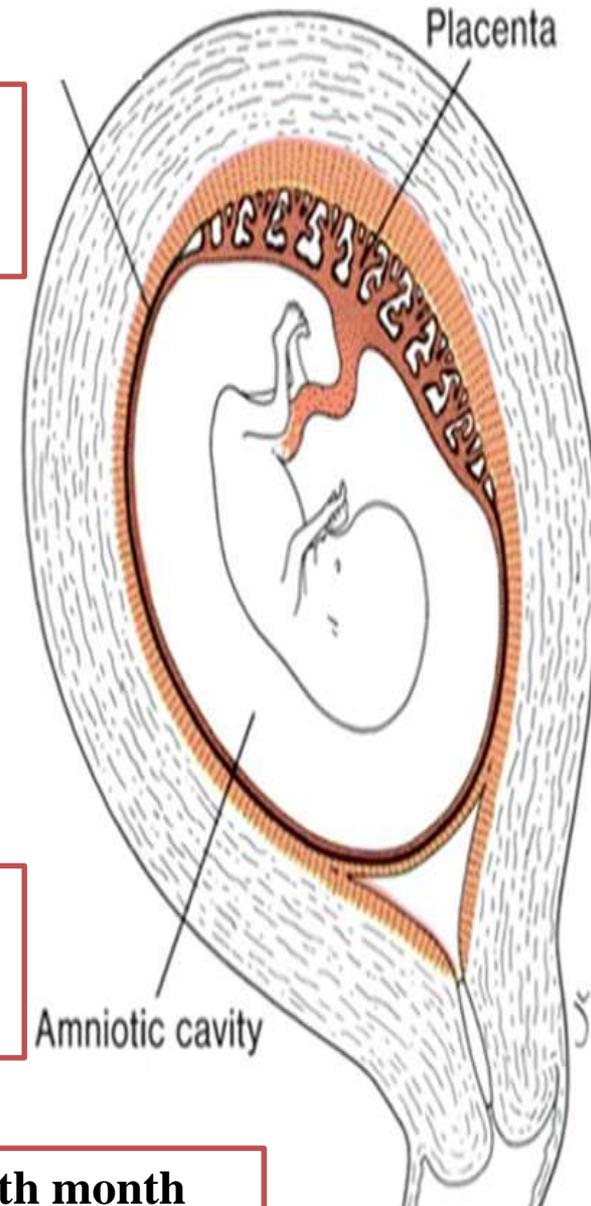
serves as a protective cushion. The fluid

- 1- prevents adherence of the embryo to the amnion
- 2- allows for fetal movements

The volume of amniotic fluid is replaced every 3 hours

From the beginning of the fifth month, **the fetus swallows** its own amniotic fluid and it is estimated that it drinks about 400 ml a day, about half of the total amount

Fetal **urine is added daily to the amniotic fluid in the fifth month** but this urine is mostly water, since the placenta is functioning as an exchange for metabolic wastes



During childbirth, the amnio-chorionic membrane forms a hydrostatic wedge that helps to dilate the cervical canal.

Ruptured amnionic sac



1-Hydramnios or polyhydramnios
is the term used to describe an excess of amniotic
fluid (1500–2000 ml)

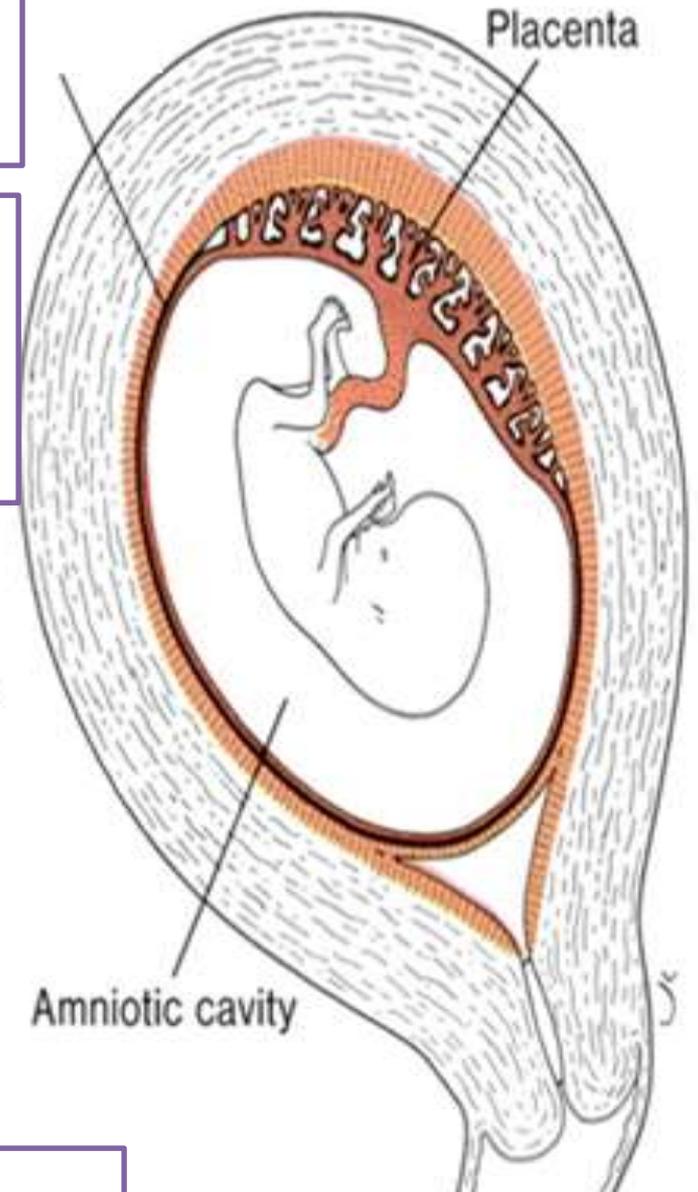
Primary causes of hydramnios include
idiopathic causes (35%)
maternal diabetes (25%)
congenital malformations including
1- central nervous system disorders (e.g., anencephaly)

2-Gastrointestinal defects
(atresias, e.g., esophageal)
that prevent the infant from swallowing the fluid

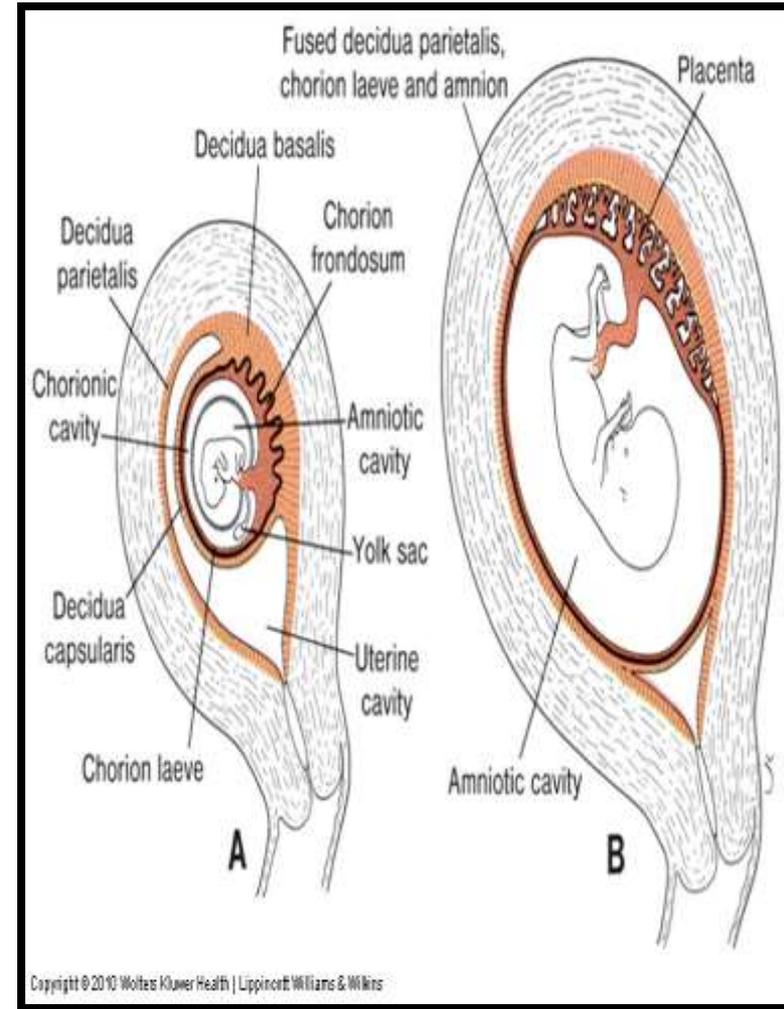
2-Oligohydramnios refers to a decreased
amount (less than 400 ml)

Oligohydramnios is a rare occurrence that
may result from renal agenesis

Premature rupture of the amnion,
the most common cause of preterm labor
occurs in 10% of pregnancies



With growth of the
chorionic vesicle
the **decidua capsularis** becomes
stretched and
degenerates
Subsequently
the chorion laeve comes
into contact with the
uterine wall
(**decidua parietalis**)
on the opposite side of the uterus and the two fuse
obliterating
the uterine lumen.



Similarly, fusion of the amnion and chorion
to form the **amniochorionic membrane** **obliterates the chorionic cavity** *It is this*
membrane that ruptures during labor
(breaking of the water).

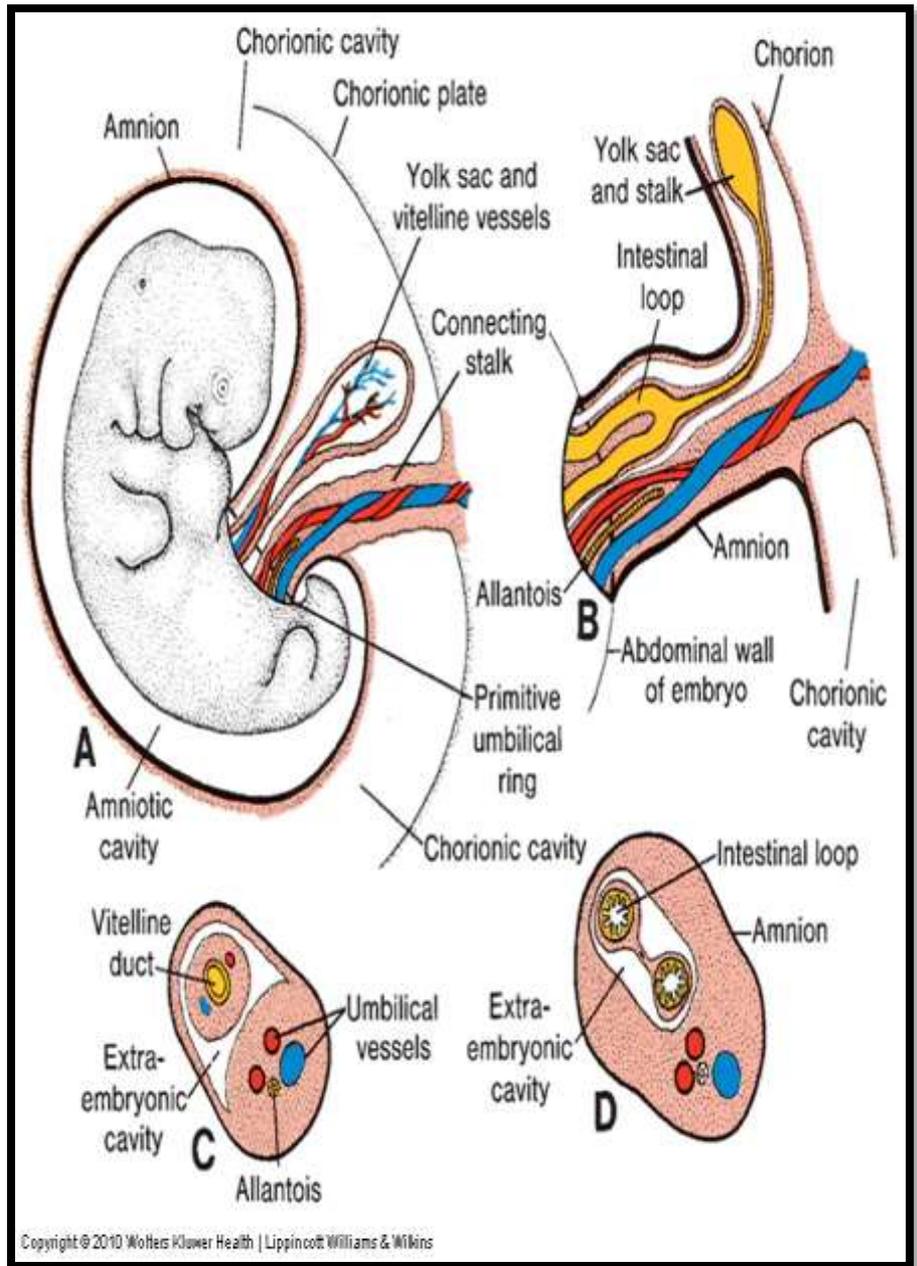
Umbilical cord

At the fifth week
of development, the following structures
pass through the
1-primitive umbilical ring

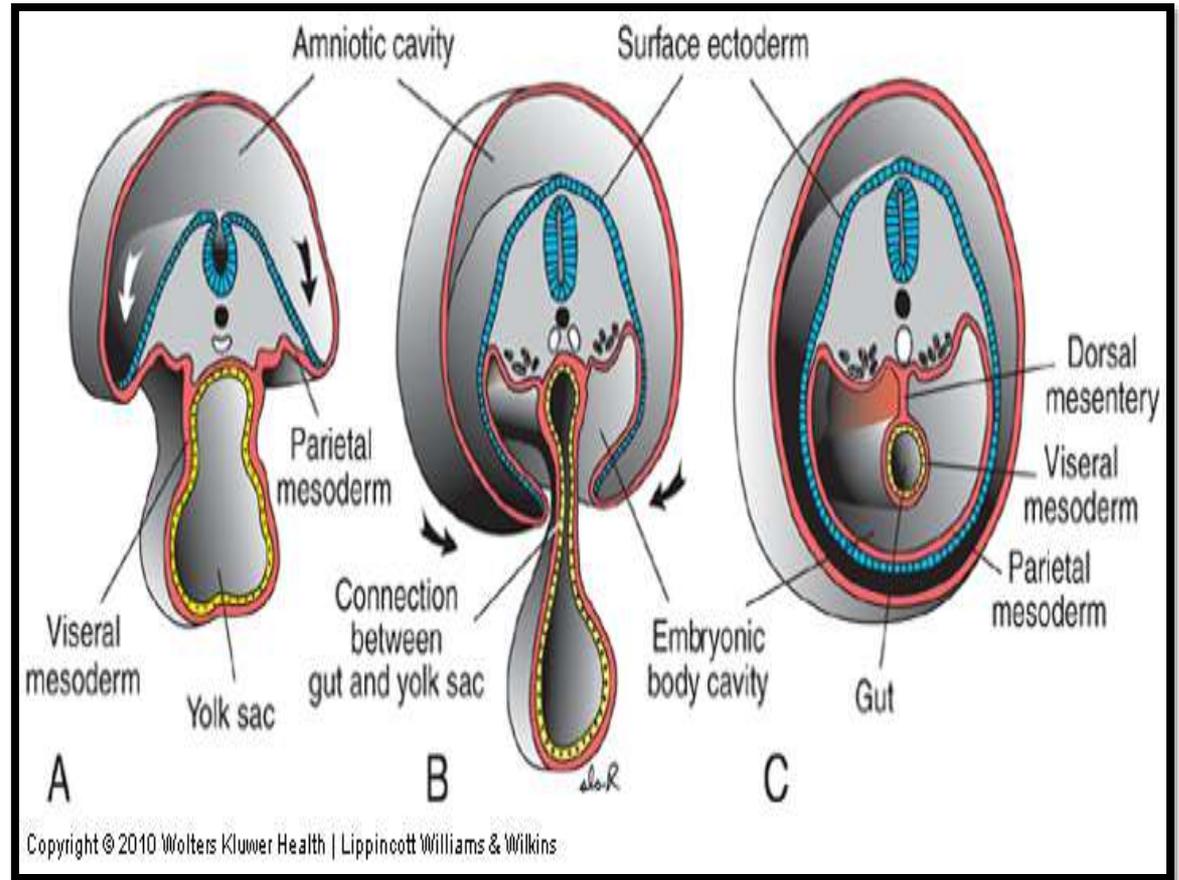
(1) **The connecting stalk, containing the allantois and the umbilical vessels, consisting of two arteries and one vein**

(2) **The yolk stalk (vitelline duct), accompanied by the vitelline vessels**

(3) **The canal connecting the intraembryonic and extraembryonic cavities**



During further development, the amniotic cavity enlarges rapidly at the expense of the chorionic cavity. As a result the amnion begins to envelop the connecting and yolk sac stalks, crowding them together and giving rise to

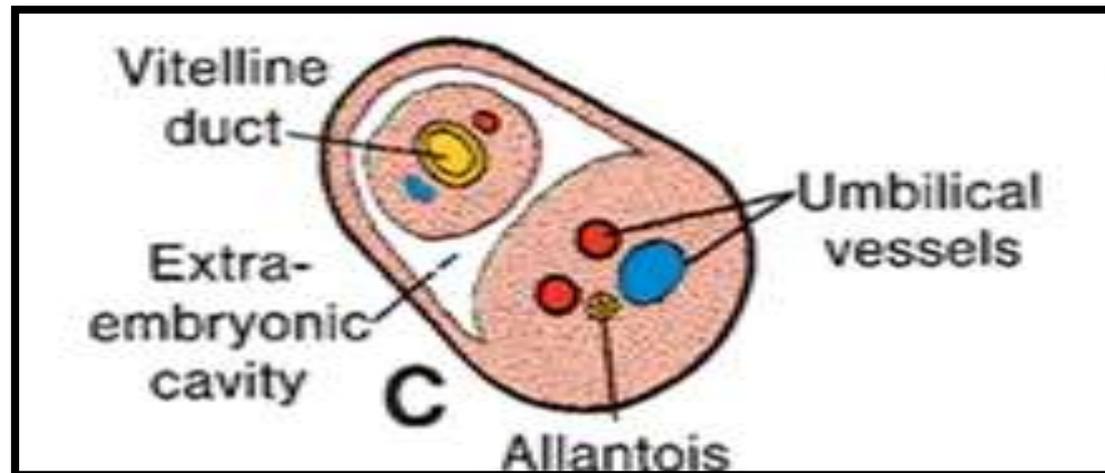
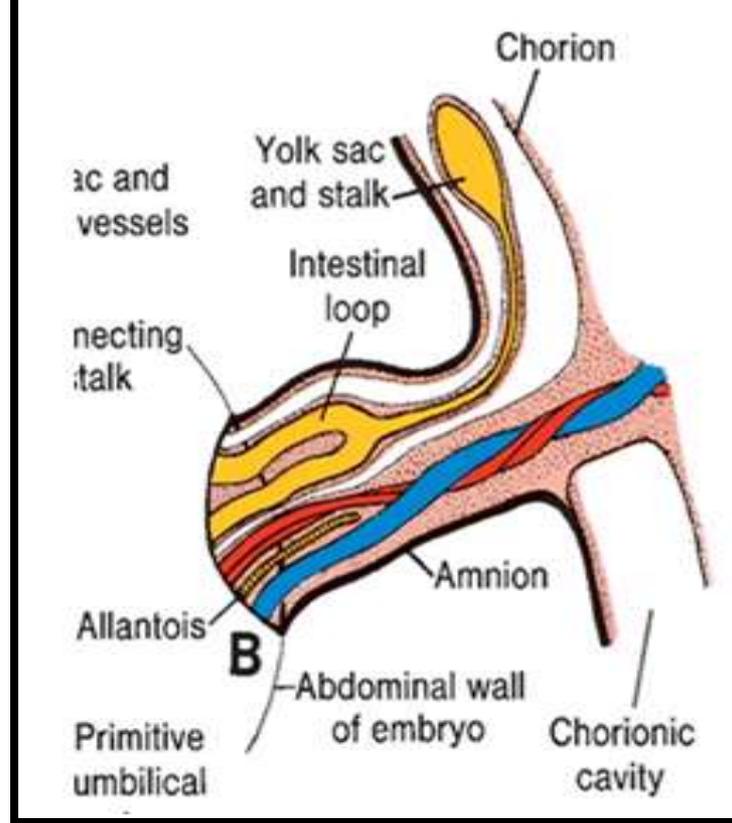


2- the primitive umbilical cord

The abdominal cavity is temporarily too small for the rapidly developing intestinal loops and some of them are pushed into the extraembryonic space in the umbilical cord. These extruding intestinal loops form a physiological umbilical hernia

At approximately the end of the **third month** the loops are withdrawn into the body of the embryo and the cavity in the cord is obliterated.

3- When the allantois and the vitelline duct and its vessels are also obliterated, all that remains in the cord **are the umbilical vessels surrounded by the jelly of Wharton.**



Summary of the Umbilical cord:

- Covered with amniotic membrane
- Contains
 - 1 umbilical vein
 - 2 umbilical arteries
 - degenerated yolk sac and allantois
- connects fetus with placenta

➤ Length 50 cm

Abnormality: >80 cm (long), An extremely long cord may encircle the neck of the fetus, usually without increased risk

<35 cm (short) may cause difficulties during delivery by pulling the placenta from its attachment in the uterus

Umbilical vessels are longer than the cord, so twisting and bending of the vessels are common

They frequently form loops, producing false knots, that are of no significance

In about 1% of pregnancies, true knots form in the cord and cause fetal death

بسم الله الرحمن الرحيم

دَعَوَاهُمْ فِيهَا سُبْحَانَكَ اللَّهُمَّ وَتَحِيَّتُهُمْ فِيهَا سَلَامٌ وَأَخِرُ دَعْوَاهُمْ أَنْ الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ

انتهى بحمد الله

Thank you all