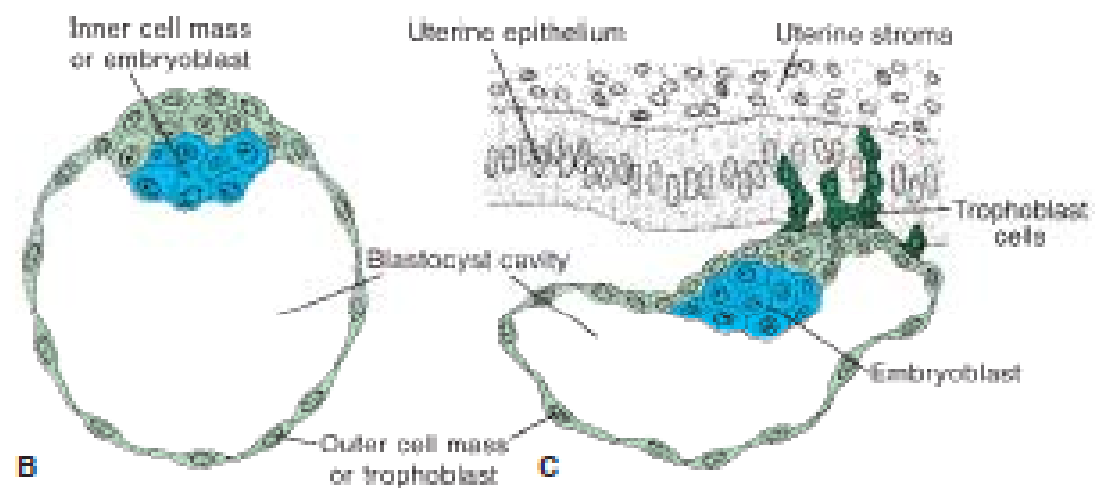
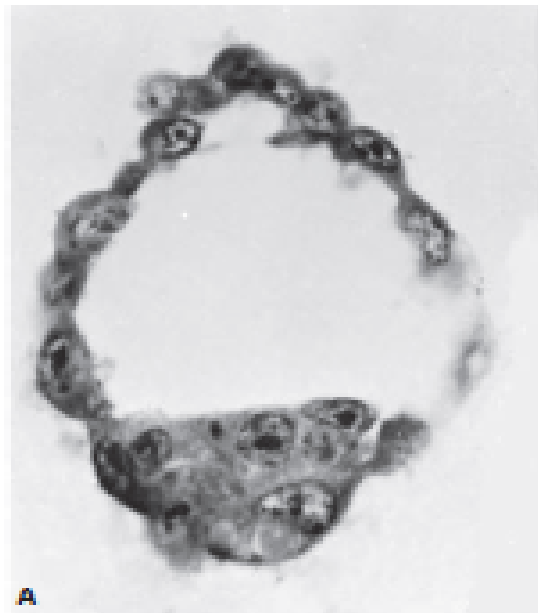


Second Week of Development Bilaminar Germ Disc



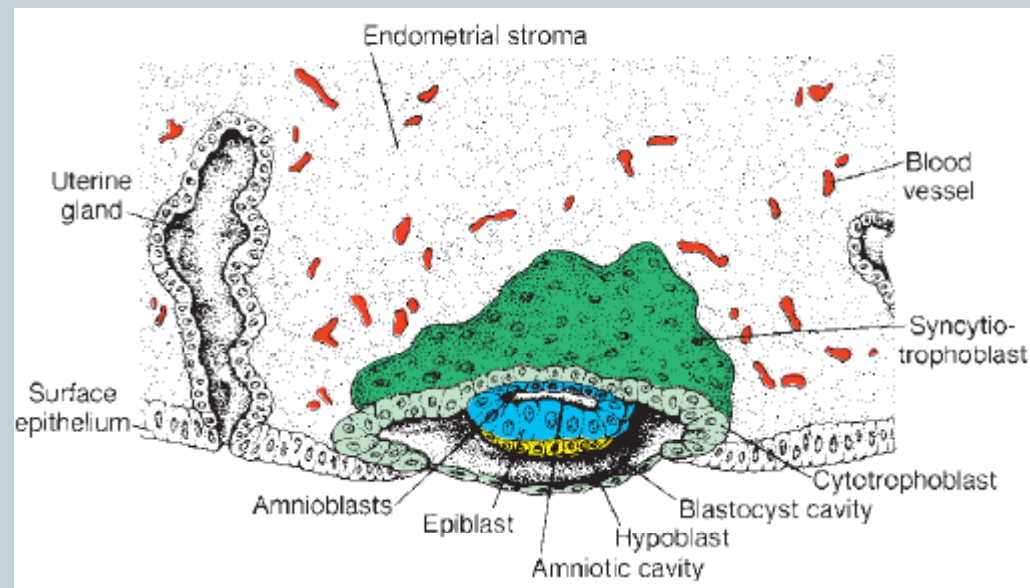
***a day-by-day
The major events of the second
week of Development***



8th day



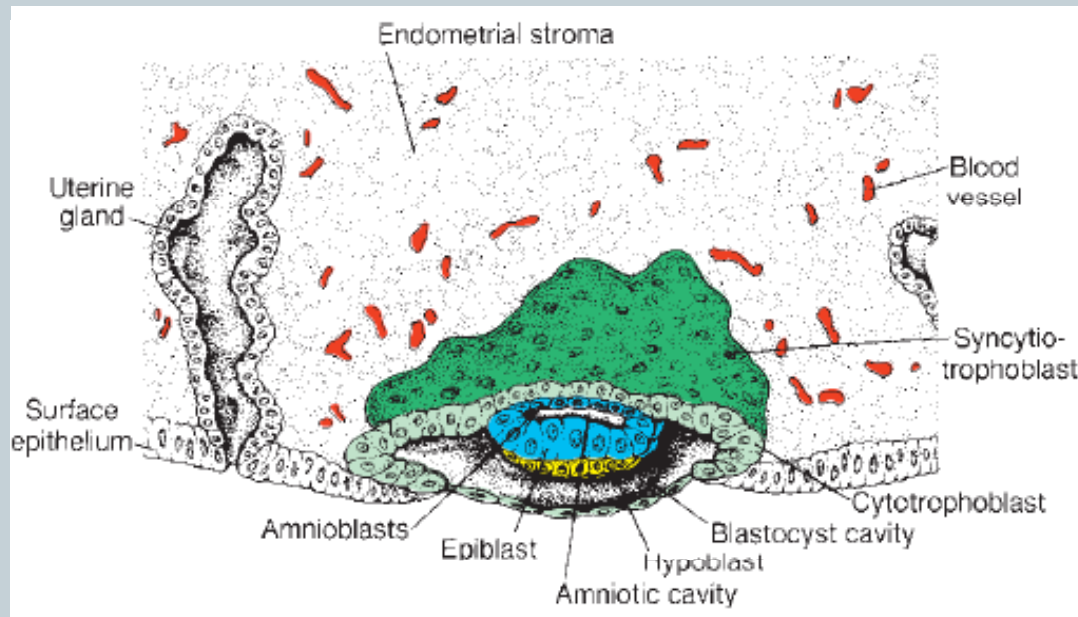
- the blastocyst is partially embedded in the endometrial stroma.
- the area over the embryoblast, the trophoblast has differentiated into two layers:
 - (1) **cytotrophoblast** (a mononucleated cells inner layer)
 - (2) **syncytiotrophoblast** (an outer multinucleated zone without distinct cell boundaries)
- Mitotic figures are only found in the cytotrophoblast



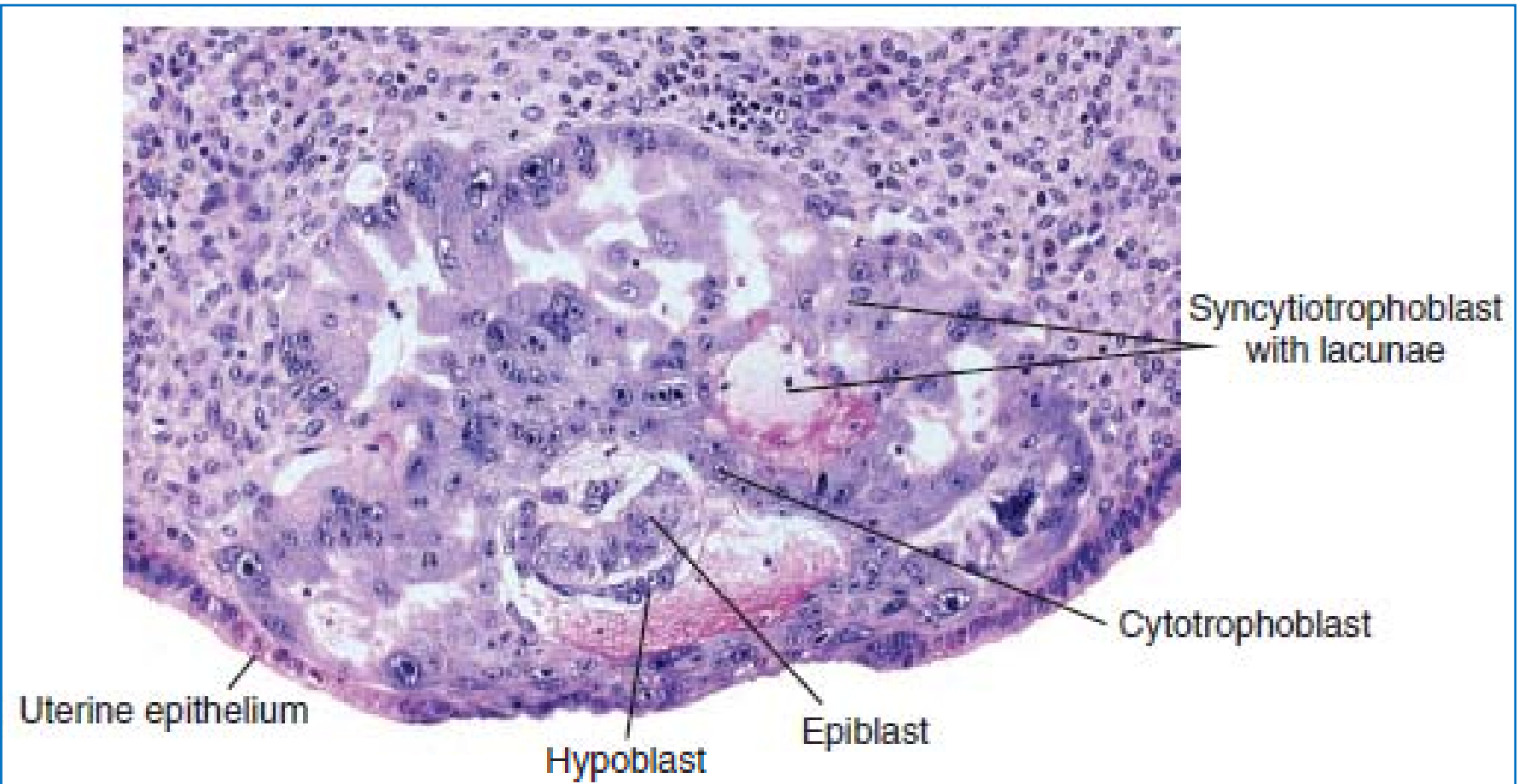
8th day



- Cells in the inner cell mass or embryoblast differentiate into two layers:
- (1) **hypoblast layer** (a layer of small cuboidal cells adjacent to the blastocyst Cavity)
- (2) **epiblast layer** (a layer of high columnar cells adjacent to the amniotic Cavity)
- form a flat disc
- **Amniotic Cavity**
- **Amnioblasts**



- edematous and highly vascular endometrial stroma
- abundant glycogen & mucus secrete by large & tortuous glands



9th day

- The blastocyst is more deeply embedded in endometrium (a fibrin coagulum)

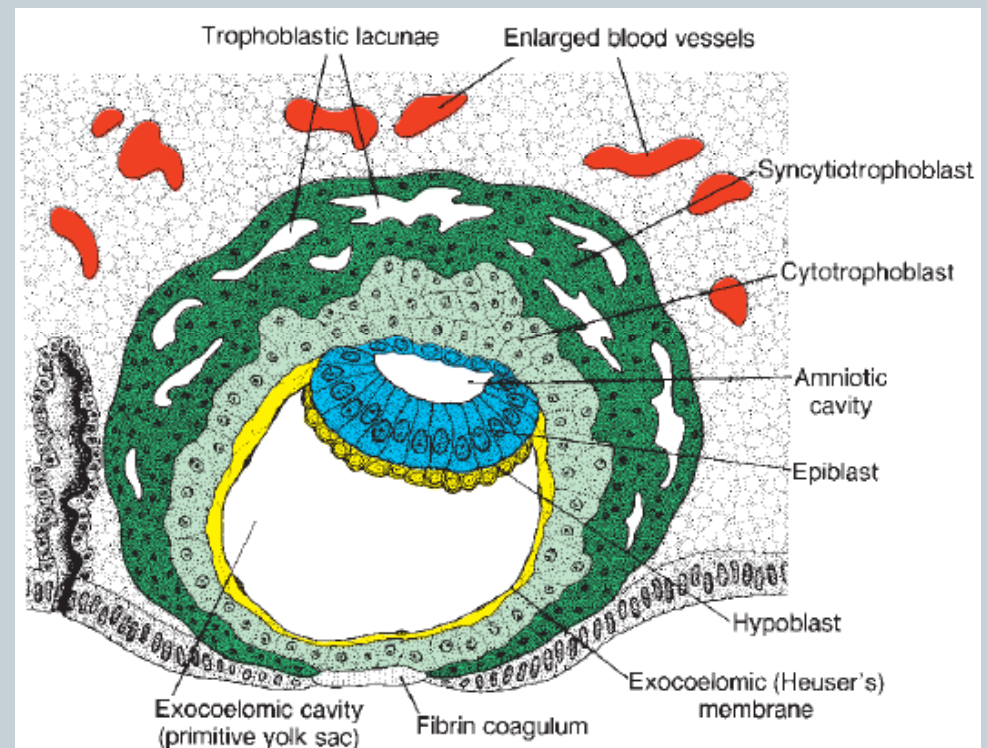
The trophoblast development, (particularly at the embryonic pole)

- vacuoles appear in the syncytium
- vacuoles fusion & large lacunae formation

lacunar stage

At the abembryonic pole

- the exocoelomic (Heuser's) membrane (hypoblast flattened cells)
- **exocoelomic cavity (primitive yolk sac)**



11th & 12th days



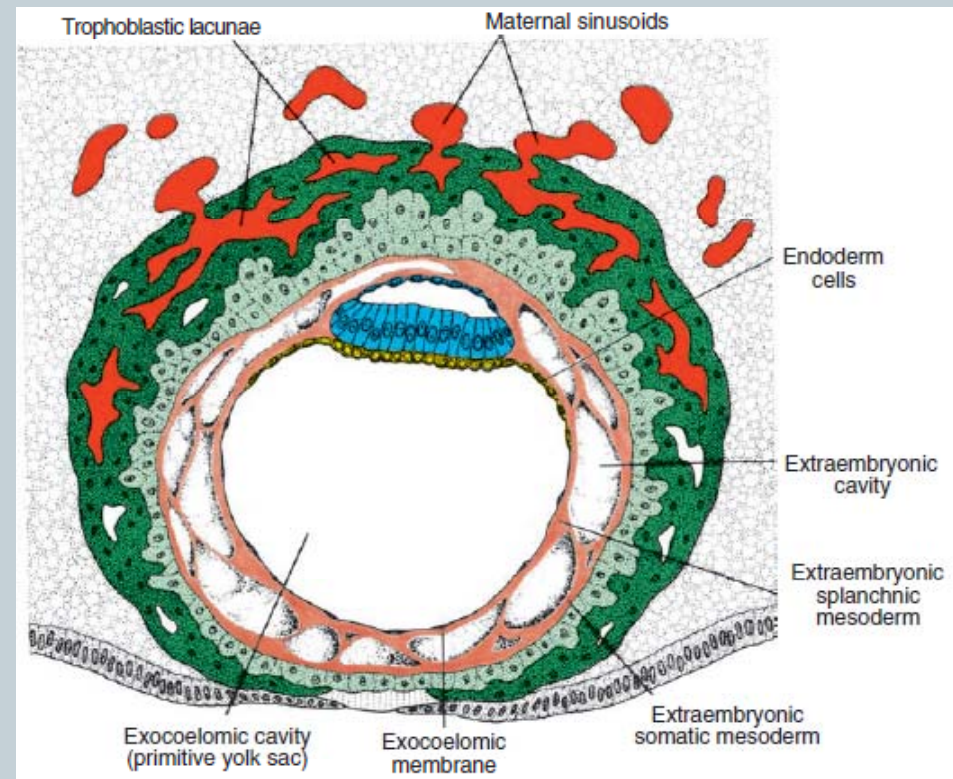
- blastocyst is completely embedded in the endometrial stroma
- slight protrusion into the lumen of the uterus

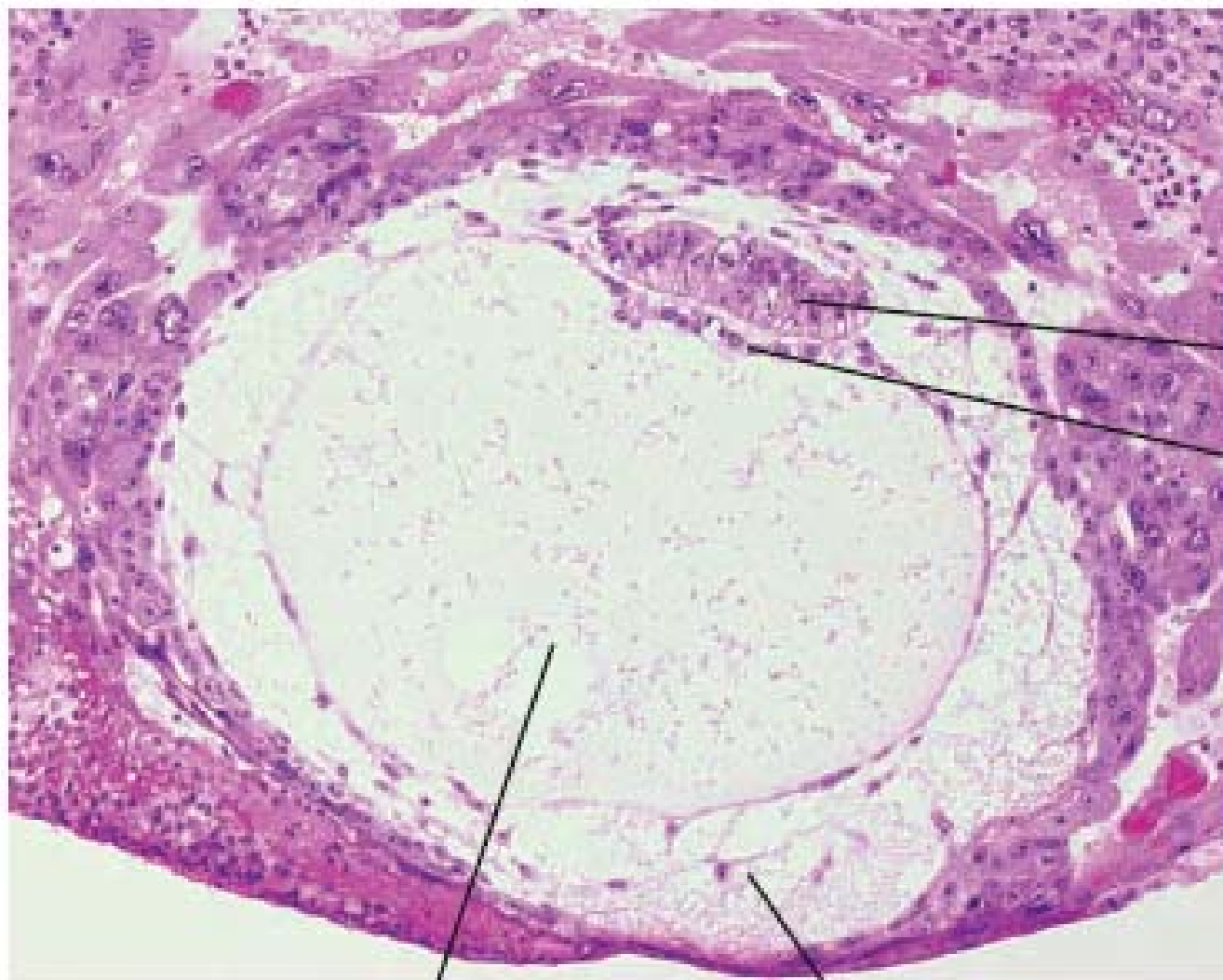
Sinusoids **uteroplacental circulation**

- exocoelomic cavity

Extraembryonic mesoderm

- **extraembryonic cavity (chorionic cavity)**
- connecting stalk
- **extraembryonic somatic mesoderm**
- **extraembryonic splanchnic mesoderm**
- **decidua reaction**





Epiblast

Hypoblast

Primitive yolk sac

Extraembryonic mesoderm

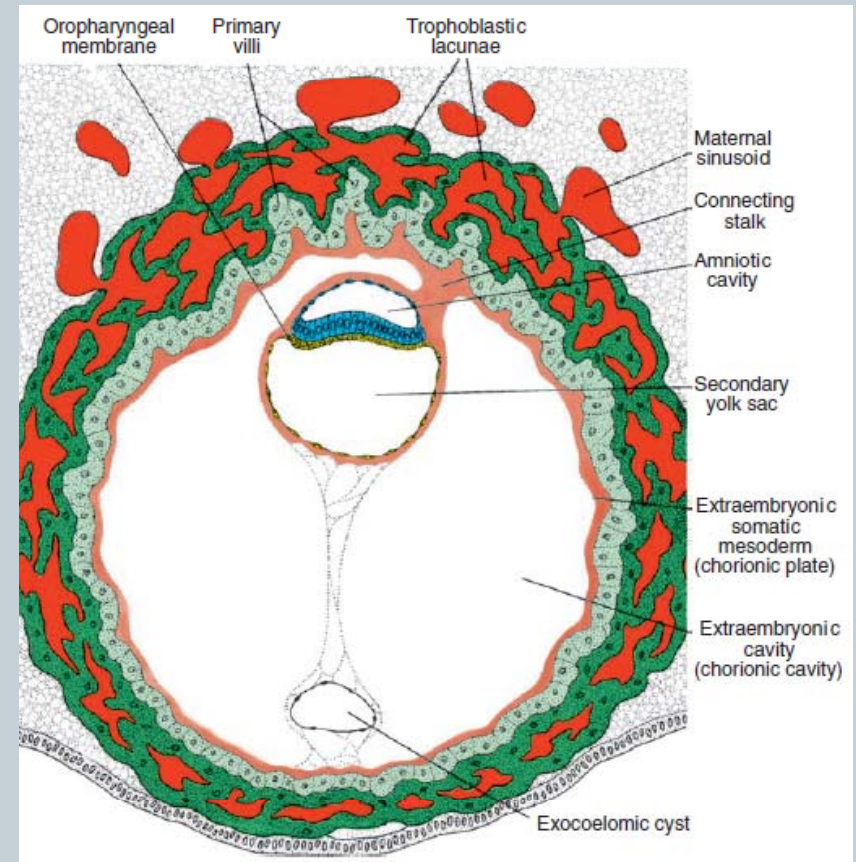
13th day



- the surface endometrium has healed.
- Occasionally, bleeding occurs at the implantation blood flow in lacunar spaces
- Secondary (definitive) yolk sac formation
- Formation of villus structure
- Primary villi

Extraembryonic coelom expand & form chorionic cavity

Connective stalk form umbilical cord



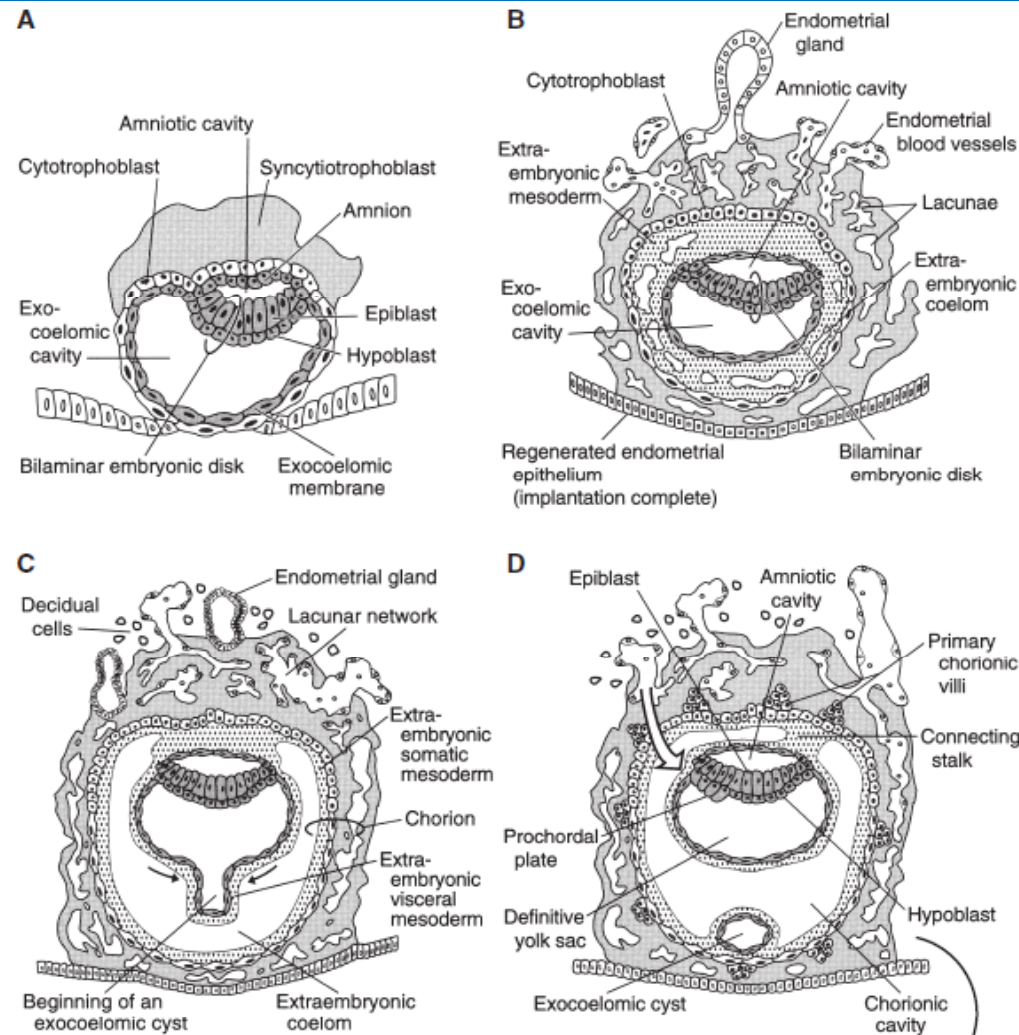
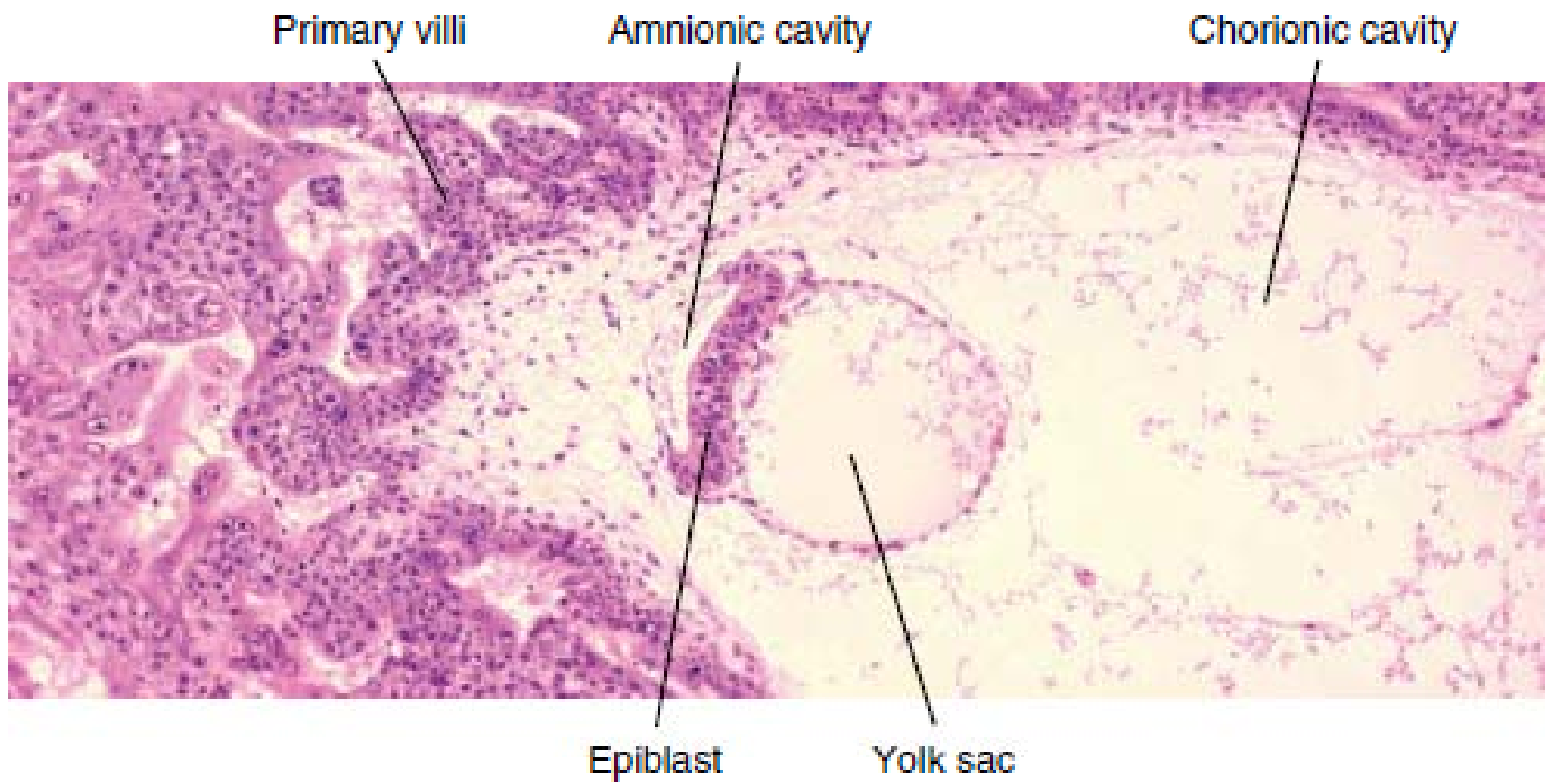


FIGURE 3.1. (A) A day 8 blastocyst is shown partially implanted into the endometrium. Extraembryonic mesoderm (EEM) has not formed yet. **(B) A day 12 blastocyst** is shown completely implanted within the endometrium, and epithelium has regenerated. This type of implantation is known as interstitial implantation. EEM begins to form. **(C) A day 13 blastocyst.** A lacunar network forms, establishing an early uteroplacental circulation. An exocoelomic cyst begins to pinch off (*small arrows*). **(D) A day 14 blastocyst.** The embryo can be described as two balloons (amniotic cavity and yolk sac) pressed together at the bilaminar embryonic disk. The *curved open arrow* indicates that the embryo receives maternal nutrients via diffusion. **(E)** A sonogram at about week 3 shows a hyperechoic rim representing the chorion (*thick arrow*) surrounding the chorionic cavity (or gestational sac). Within the chorionic cavity, two tiny cystic areas (i.e., the amnion and yolk sac) separated by a thin echogenic line (i.e., embryonic disk) can be observed. Note the hyperechoic base of the endometrium (*long arrows*) and two endometrial cysts (*short arrows*).



Clinical correlations



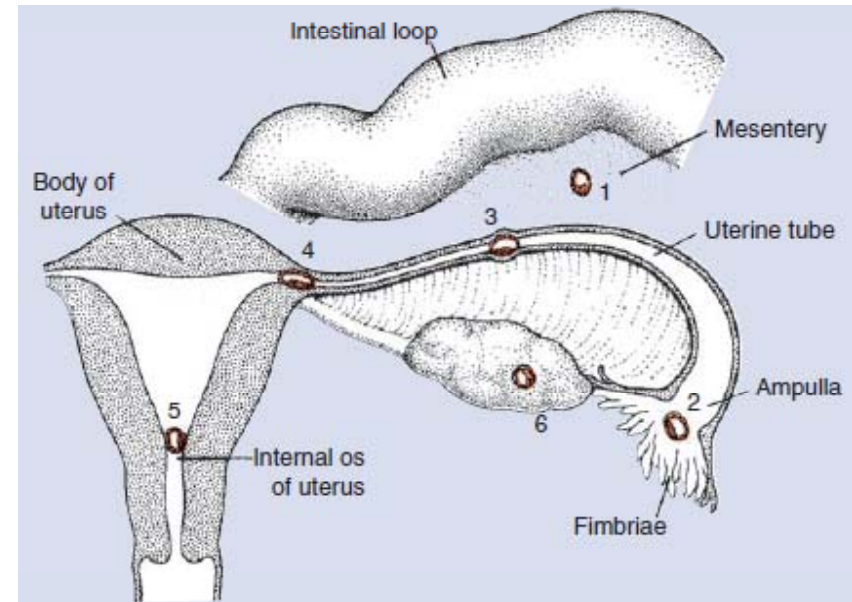
- Human chorionic gonadotropin (hCG)
 - Second week
 - RIA
 - Immune system & pregnancy
 - Cellular to humoral immunity
-
- MS & AR (cellular autoimmunity)
 - Lupus (humoral autoimmunity)

Abnormal implantation



Normally:

- Anterior or posterior wall of uterus
- Cervix internal os (placenta previa)

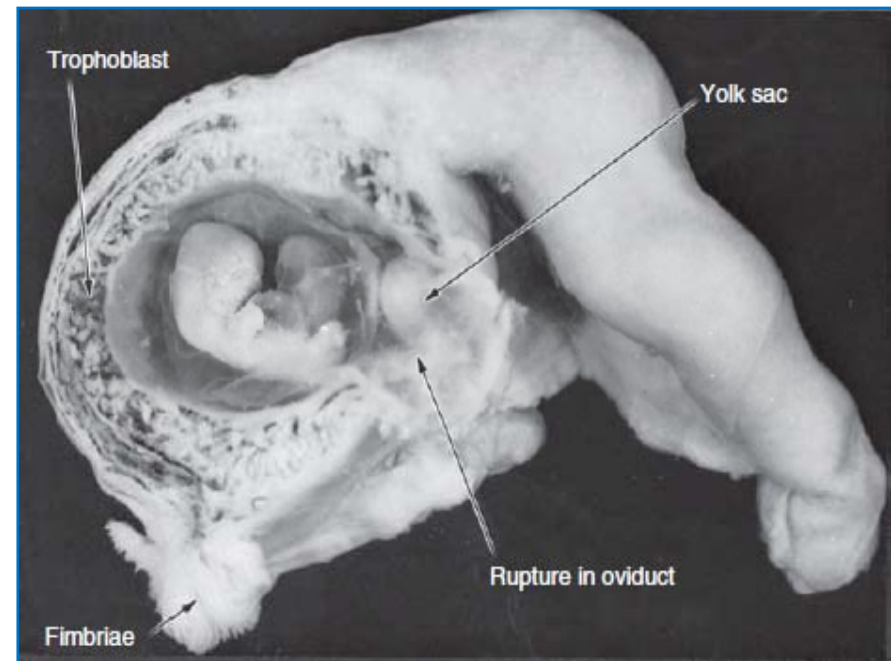
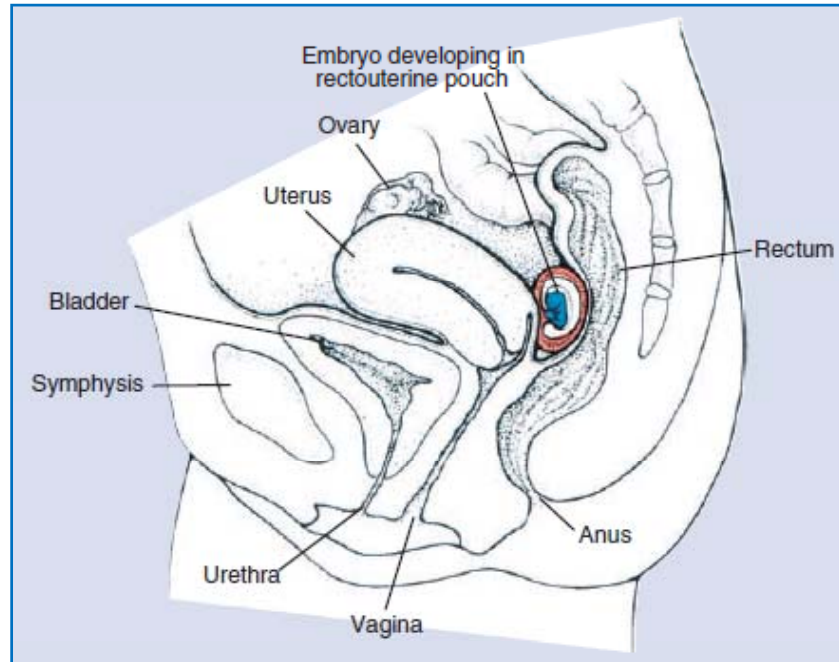


- Ectopic pregnancy (2%) (9% mortality)

Abdominal cavity (rectouterine cavity)

Ovary

Uterine tube (95%)



Abnormal implantation



Hydatidiform mole (choriocarcinoma)

Paternal

Genomic imprinting

15% of oocytes no fertilization

10-15% cleavage but no implantation

70-75% impantation

58% survive to second week (16% abnormal)

Only 42% of fertilized oocytes survived

ظاهرا تنها چیزی که تو دنیا
عادلانه تقسیم شده ،عقله
چون هیچ کس اعتراض نمیکنه ؛
بگه مال من کمه

