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DISCUSS THE 2ND WEEK OF DEVELOPMENT

At the end of the first week, the blastocyst comes in contact with the uterine wall and adheres to it, embedding itself in the uterine lining via the trophoblast cells.

During the second week, the following events occur

1. Completion of Implantation of blastocyst
2. Formation of bilaminar germ disc
3. Formation of extra embryonic structures

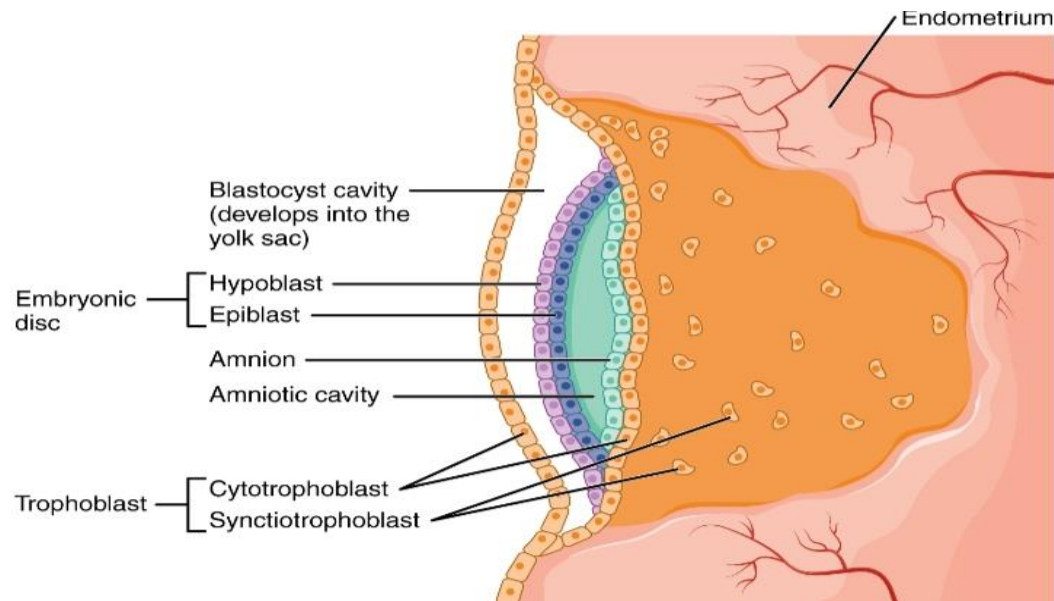
Day 8

Implantation of the blastocyst is completed during the second week of development. It occurs during a restricted time of 6 to 10 days after ovulation and fertilization. As the blastocyst implants, more trophoblast contacts the endometrium and differentiates into two layers.

- a. The inner layer, the cytotrophoblast, that is mitotically active and forms new cells that migrate into the increasing mass of syncytiotrophoblast, where they fuse and lose their cell membranes.
- b. The syncytiotrophoblast, a rapidly expanding, multinucleated mass in which no cell boundaries are discernable.

As implantation of the blastocyst continues, a small space appears in the embryoblast which is the primordium of the amniotic cavity. Soon, amniogenic cells, amnioblasts, separate from the epiblast and form the amnion which encloses the amniotic cavity. Changes occur in the embryoblast that result in the formation of a flat, almost circular bilaminar plate of cells, the embryonic disc, consisting of two layers.

- a. Epiblast, the thicker layer, consisting of high columnar cells related to the amniotic cavity
- b. Hypoblast, consisting of small cuboidal cells adjacent to the exocoelomic cavity.



DAY 9

Blastocyst is more deeply embedded in the endometrium. The penetration defect on the surface epithelium is now covered by fibrin coagulum. Some vacuoles appear inside the trophoblast and fuse to form numerous number of lacuna. It is known as lacuna stage. Cells of the hypoblast form a thin membrane which lines the inner surface of the cytotrophoblast. This membrane is known as the exocoelomic membrane. This membrane forms a new cavity called the exocoelomic cavity/ primitive yolk sac/ primary umbilical vesicle.

DAY 11-12

Blastocyst is now completely embedded in the endometrium. The cells of the syncytiotrophoblast penetrate deeper the stroma and erode the endometrial lining of the endometrial capillaries. The ruptured capillaries are referred to as sinusoids. When this happens, maternal blood enters the lacuna network, thus, the primordial uteroplacenta circulation is established. A new CT appears between the exocoelomic membrane and cytotrophoblast which is known as the extra embryonic mesoderm. Some cavities appear within the extra embryonic mesoderm and divides it into 2 layers:-

- I) Extra embryonic somatic mesoderm

II) Extra embryonic splanchnic mesoderm.

During this time, decidual reaction also takes place. During decidual reaction, the embryo swells because of accumulation of glycogen and lipid in their cytoplasm, they are known as decidual cells. Decidual reaction is to provide nutrition for the early embryo and immunologically privilege for the conceptus.

DAY 13

Surface defect of the endometrium is completely healed. Cells of the cytotrophoblast penetrate the syncytiotrophoblast forming cellular columns. Cellular columns with syncytial covering is known as **PRIMARY VILLI**. Primary yolk sac becomes smaller in size and is known as the secondary yolk sac/ definitive yolk sac. By the formation, large portions of the exocoelomic cavity are pinched off forming the exocoelomic cysts. Meanwhile, the extra embryonic coelom expands and forms a large cavity called the chorionic cavity the extra embryonic mesoderm lining the inside of the cytotrophoblast is then known as the chorionic plate. The only place where extra embryonic mesoderm traverses the chorionic cavities in the connecting stalk. With development of blood vessels, the connecting stalk becomes the umbilical cord.

