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COURSE: EMBRYOLOGY

DEPARTMENT/COLLEGE: MBBS/MHS

ASSIGNMENT: DISCUSS SECOND WEEK OF
DEVELOPMENT

There are three major events which take place in the second week of embryonic development;

Completion of implantation

Formation of bilaminar germ disc

Development of extra embryonic structure

Day 8

- At the 8th day the blastocyst is **partially embedded** in the endometrium.
- The syncytiotrophoblast continues to erode the endometrium
- Cells of the cytotrophoblast migrate more into the endometrium
- More cells in the cytotrophoblast divide and migrate into the syncytiotrophoblast, where they fuse and lose their individual cell membrane.

Note; the epiblast (columnar) and hydroblast (cuboidal) give rise to the BILAMINAR EMBRYONIC DISC.

Day 9

- The blastocyst is **deeply embedded** in the endometrium and the penetration defect is closed by a coagulum called fibrin
- Syncytiotrophoblast continues to erode the endometrium
- Development of trophoblastic lacunae (vacuoles appear at the region of trophoblast and fuse to form larger lacunae). It is also called the lacunae stage.

- the cells of the hypoblast adjacent to the cytotrophoblast form a thin membrane called the exocoelomic (Heuser's) membrane
- this membrane lines the inner surface of the cytotrophoblast
- the exocoelomic (Heuser's) membrane together with the hypoblast forms the lining of the exocoelomic cavity, or primitive yolk sac or primary umbilical vesicle

Day 11-12

- The blastocyst is completely embedded in the endometrium,
- and the surface epithelium almost entirely covers the original defect in the uterine wall
- The blastocyst now produces a slight protrusion into the lumen of the uterus
- cells of the syncytiotrophoblast penetrate deeper into the stroma(tissue) and erode the endothelial lining of the endometrial capillaries
- These ruptured endometrial capillaries are called **sinusoids**
- The lacunae then begin to communicate with the sinusoids, and maternal blood enters the lacunar system
- The communication of the eroded endometrial capillaries with the lacunae establishes the **primordial uteroplacental circulation**
- When maternal blood flows into the lacunae, oxygen and nutritive substances are available to the embryo.

Day 13

- The surface defect in the endometrium has been completely covered by the surface epithelium
- Occasionally bleeding occurs at the implantation site as a result of increased blood flow into the lacunar spaces.
- The syncytiotrophoblast changes to syncytium(primary villi)
- The connective stalk gives rise to the future umbilical cord.
- The extra embryonic cavity enlarges and forms the chorionic cavity

CLINICAL CORRELATE

- The syncytiotrophoblast produces a hormone called the **human chorionic gonadotrophin (hCG)**, which enters the maternal blood via lacunae keeps the corpus luteum secreting estrogens and progesterone
- hCG maintains the hormonal activity of the corpus luteum in the ovary during pregnancy

