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## **DISCUSS THE SECOND WEEK OF DEVELOPMENT**

3 Major events occur. They are

- Completion of implantation
- Formation of bilaminar disc
- Development of extra embryonic structures

### **DAY 8**

- Blastocyst is partially embedded in the endometrium
- Syncytiotrophoblast will continue to erode the endometrium
- Cells of the cytotrophoblast continue to divide and migrate into the region of the Syncytiotrophoblast
- Embryoblast will differentiate into
  - Epiblast- made of columnar cells
  - Hypoblast- made of cuboidal cells
- Epiblast and hypoblast both form the bilaminar germ disc
- Development of amnioblast or amnion which are cells adjacent to the cytotrophoblast
- Development of amniotic cavity

### **DAY 9**

- Blastocyst is deeply embedded in the endometrium
- Syncytiotrophoblast will continue to erode the endometrium
- Cells of the cytotrophoblast continue to divide and migrate into the region of the Syncytiotrophoblast
- surface epithelium is closed by fibrin coagulum
- adjacent to the bottom cytotrophoblast is the exocoelomic membrane/Heuser's membrane
- a cavity between the Heuser's membrane and hypoblast is the exocoelomic cavity/primary yolk sac/primary umbilical vesicle
- vacuoles develop in the region of the Syncytiotrophoblast(which becomes longer) called trophoblastic lacunae

### **DAY 11-12**

- blastocyst is completely embedded in the endometrium
- Syncytiotrophoblast will continue to erode the endometrium
- Cells of the cytotrophoblast continue to divide and migrate into the region of the Syncytiotrophoblast
- As Syncytiotrophoblast is entering, it is rupturing some capillaries, these capillaries are now called sinusoids.
- The ruptured sinusoids communicate with lacunae; transporting blood, oxygen and nutrients. At this stage a primordial uteroplacental circulation is established.

- Cavities develop at the region of the extra embryonic mesoderm called extra embryonic cavity/coelom. It divides the mesoderm into two parts
  - \*extra embryonic somatic mesoderm (adjacent to the cytotrophoblast)
  - \*extra embryonic splanchnic mesoderm
- A reaction takes place called desidual reaction. Cells of endometrium swell because of accumulation of glycogen and lipid in their cytoplasm and they are known as desidual cells. Primary function is to provide nutrition for the early embryo and an immunologically privileged site for the conceptus.

### **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
- Cells of the cytotrophoblast proliferate locally and penetrate into the Syncytiotrophoblast, forming cellular columns surrounded by syncytium
- Cellular columns with the syncytial covering are known as primary villi
- The primary yolk sac becomes reduced in size and is known as the secondary yolk sac
- This new cavity is known as the secondary yolk sac or definitive yolk sac or the secondary umbilical vesicle
- In humans the yolk sac contains no yolk but is important for the transfer of nutrients between the foetus and mother
- This yolk sac is much smaller than the original exocoelomic cavity or primitive yolk sac
- During its formation, large portions of the exocoelomic cavity are pinched off to form exocoelomic cysts
- Exocoelomic cysts are often found in the extraembryonic cavity or chorionic cavity or extraembryonic coelom
- Meanwhile, the extraembryonic coelom expands and forms a large cavity called the chorionic cavity
- The extraembryonic mesoderm lining the inside of the cytotrophoblast is then known as the chorionic plate
- The only place where extraembryonic mesoderm traverses the chorionic cavity is in the connecting stalk
- With development of blood vessels, the connecting stalk becomes the umbilical cord