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200level MBBS

EMBRYOLOGY ASSIGNMENT

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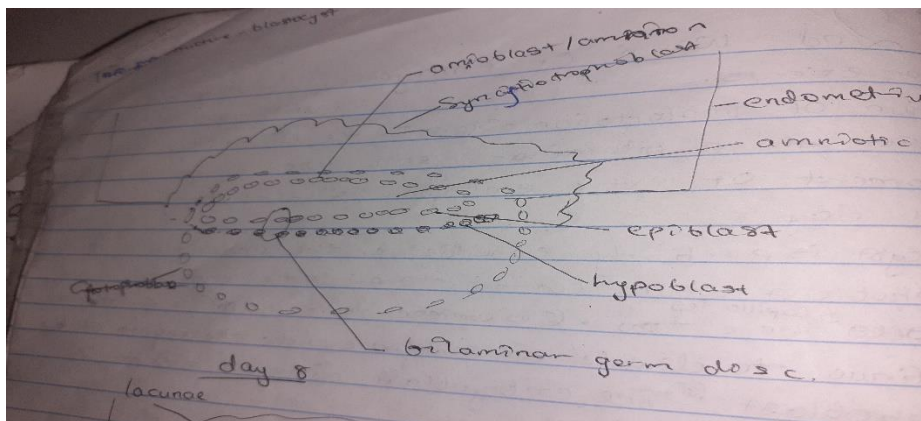
The 2nd week of embryonic development

During the second week of embryonic development 3 major events take place:

1. Completion of Implantation (starts in the first week)
2. Formation of a bi-laminar germ disc
3. Development of extra embryonic structures.

Now, I would divide the discussion into 4 parts, day 8, day 9, days 11-12 and day 13.

We would be starting at **DAY 8**

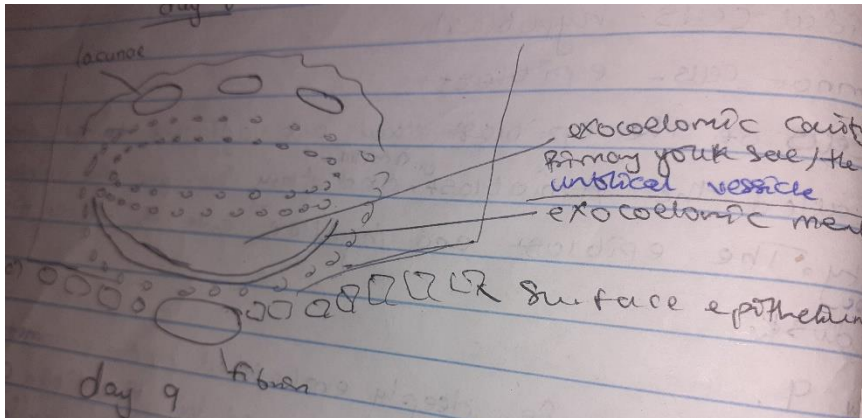


1. The blastocyst is partially embedded in the endometrium.
2. The endometrium as well as its blood vessels would continue to be eroded by the syncytiotrophoblast
3. The cells of the cytotrophoblast would continue to divide and they would migrate to the syncytiotrophoblast region.
4. The embryoblast differentiates into 2: cuboidal cells (hypoblast) and columnar cells (epiblast)

The cells of the epiblast that are adjacent to the cytotrophoblast are called the amnioblast or Amnion; they surround the amniotic cavity.

The epiblast and hypoblast give rise to the bi-laminar germ (embryonic) disc

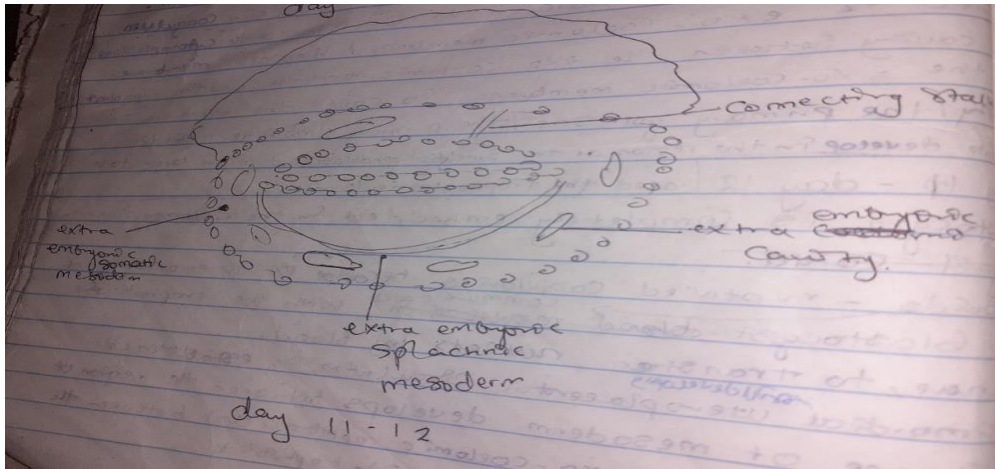
DAY 9



On the 9th day of embryonic development

1. The blastocyst is deeply embedded in the endometrium
2. The endometrium as well as its blood vessels would continue to be eroded by the syncytiotrophoblast
3. The cells of the cytotrophoblast would continue to divide and they would migrate to the syncytiotrophoblast region.
4. The surface epithelium is closed by the fibrin coagulum
5. A membrane lies adjacent to the region of the cytotrophoblast called the exo-coelomic membrane/ Heussers membrane; the cavity between the hypoblast and exo-coelomic membrane is called the exo-coelomic cavity/ the primary yolk sac/ the primary umbilical vesicle.
6. Vacuoles develop in the region of the syncytiotrophoblast and become larger to be called the trophoblastic lacunae

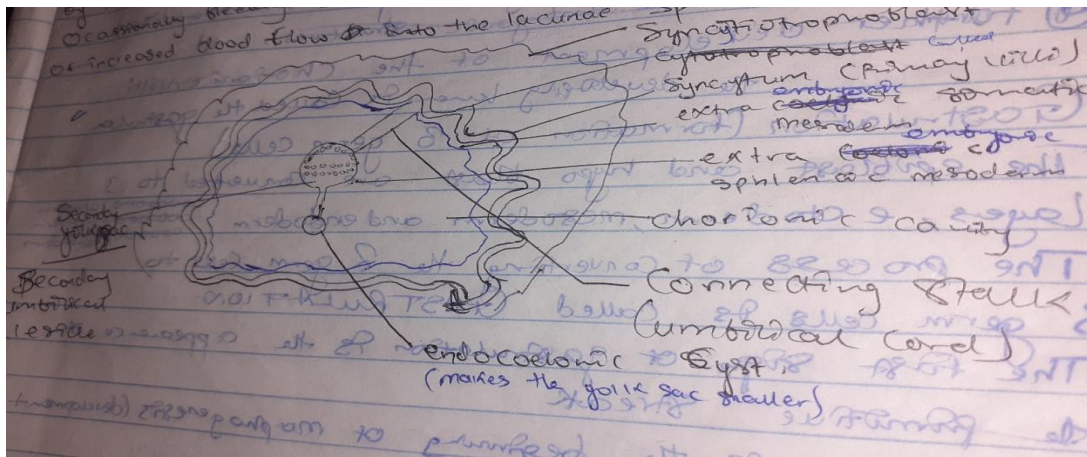
DAY11 - DAY12



1. The blastocyst is completely embedded in the endometrium.
 2. The sinusoids (capillaries ruptured because of the embedding of the blastocyst) communicate with the trophoblastic lacunae to transfer nutrients by blood.
 3. A primordial utero-placental circulation is established.
 4. A space of mesoderm develops between the region of the cytotrophoblast and exo-coelomic membrane and between the region of the amnion and the cytotrophoblast. The mesoderm covers all areas minus the connecting stalk. The space is called the extra-embryonic mesoderm, cavities develop there.
 5. The mesoderm has 2 parts
 - i. The extra embryonic splanchnic mesoderm: lies between the exo-coelomic membrane and the extra embryonic cavity
 - ii. The extra embryonic somatic mesoderm: lies before the extra embryonic membrane and lines the cytotrophoblast.
- DECIDUAL REACTION (transformation of the endometrial connective tissue) takes place; here, the cells of the endometrium swell because of the accumulation of glycogen and lipid in their cytoplasm and they become known as decidual cells.

Note: the above reaction is required to provide nutrition for the early embryo and an immunologically privileged site for the conceptus.

Day 13



On the 13th Day:

1. The surface epithelium has completely covered the surface defect in the endometrium.
2. Bleeding occasionally occurs at the implantation site as a result of increased blood flow into the lacunae spaces.
3. Cells of the cytotrophoblast acquire syncytium and they are then referred to as the primary villi, extending to the region of the syncytiotrophoblast.
4. The connecting stalk gives rise to the umbilical cord
5. The extra embryonic cavity enlarges to give rise to the chorionic cavity.
6. The primary yolk sac changes to the secondary yolk sac or secondary umbilical vesicle.

Clinical correlate

The syncytiotrophoblast produces a hormone called the human chorionic gonadotropin (HCG) which keeps the corpus luteum.