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18/MHS01/006

MEDICINE AND HEALTH SCIENCES

MEDICINE AND SURGERY

ANA 205

EMBRYOLOGY

1. Discuss the second week of development.

Answer:

2nd week of embryonic development

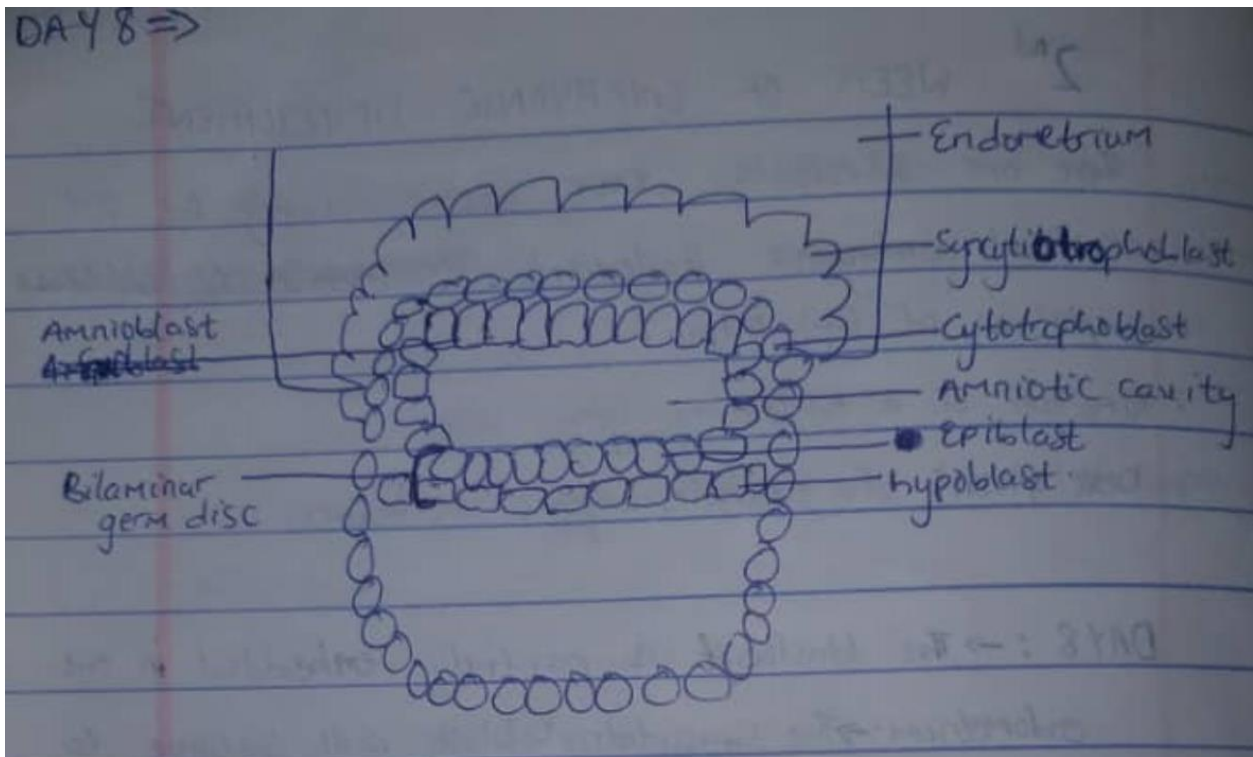
The following events take place during the 2nd week of development:

- i. Completion of implantation of the blastocyst.
- ii. Formation of bilaminar disc.
- iii. Development of extra embryonic structure.

Day 8

- The blastocyst is partially embedded in the wall of the endometrium.
- The syncytiotrophoblast will continue to erode the endometrium.
- The cytotrophoblast will continue to divide and migrate into the region of the syncytiotrophoblast.
- The embryoblast (inner mass cell) will differentiate into two cell types:
 - Cuboidal cells -> Hypoblast
 - Columnar cells -> Epiblast

Epiblast cells: The epiblast cells adjacent or close to the cytotrophoblast are called Amnioblast/Amnion. The epiblast cells surround a cavity called the Amniotic cavity. The epiblast cells together with the hypoblast cells give rise to the Bilaminar disc.



Day 9

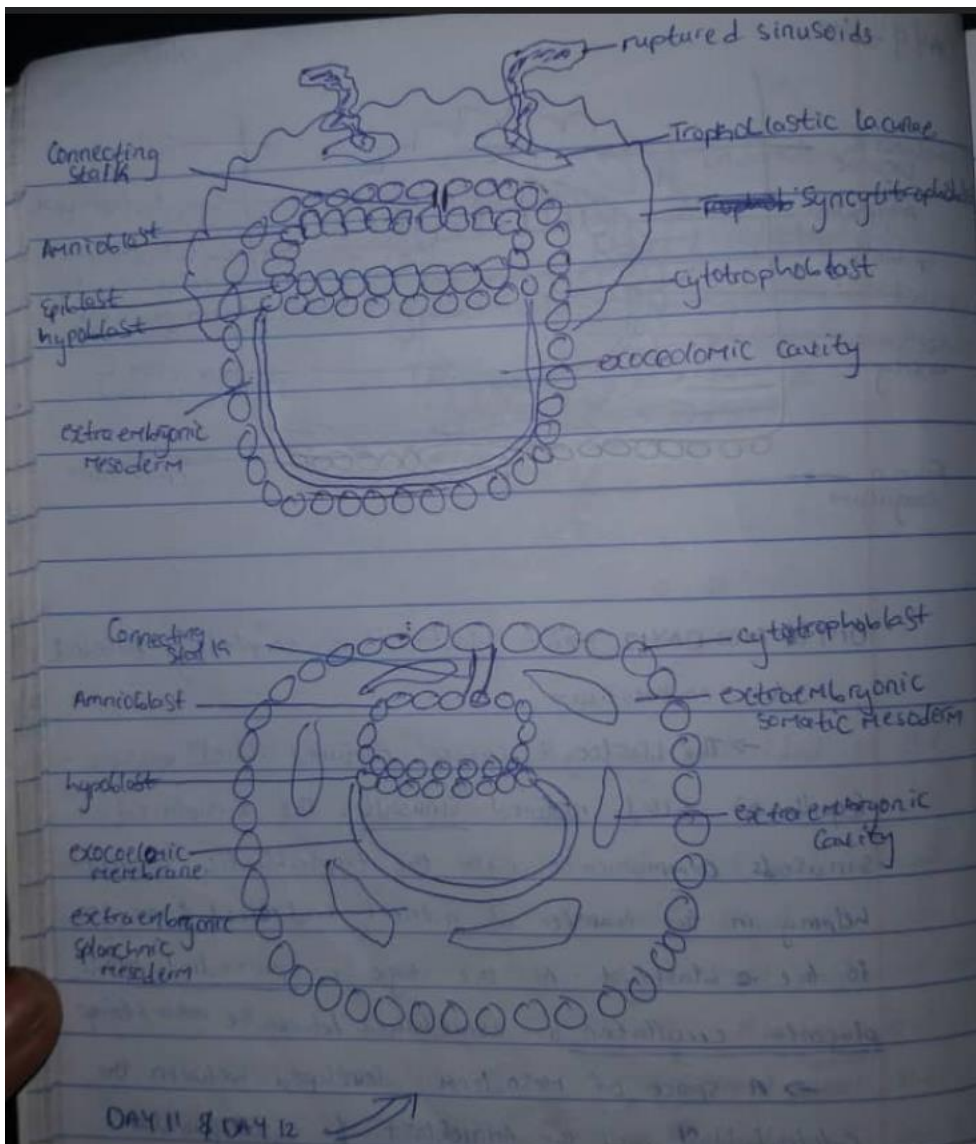
- The blastocyst is deeply embedded in the endometrium.
- The surface epithelium of the endometrium is closed by fibrin coagulum.
- The exocoelomic membrane is formed adjacent to the lower cytotrophoblast (a.k.a Heusers membrane).
- The exocoelomic cavity is also formed between the exocoelomic membrane and the hypoblast. the cavity is called primary yolk sack or primary umbilical vesicle.
- Vacuoles develop at the region of the syncytiotrophoblast and they become larger and are called Trophoblastic Lacunae.



Day 11 and Day 12

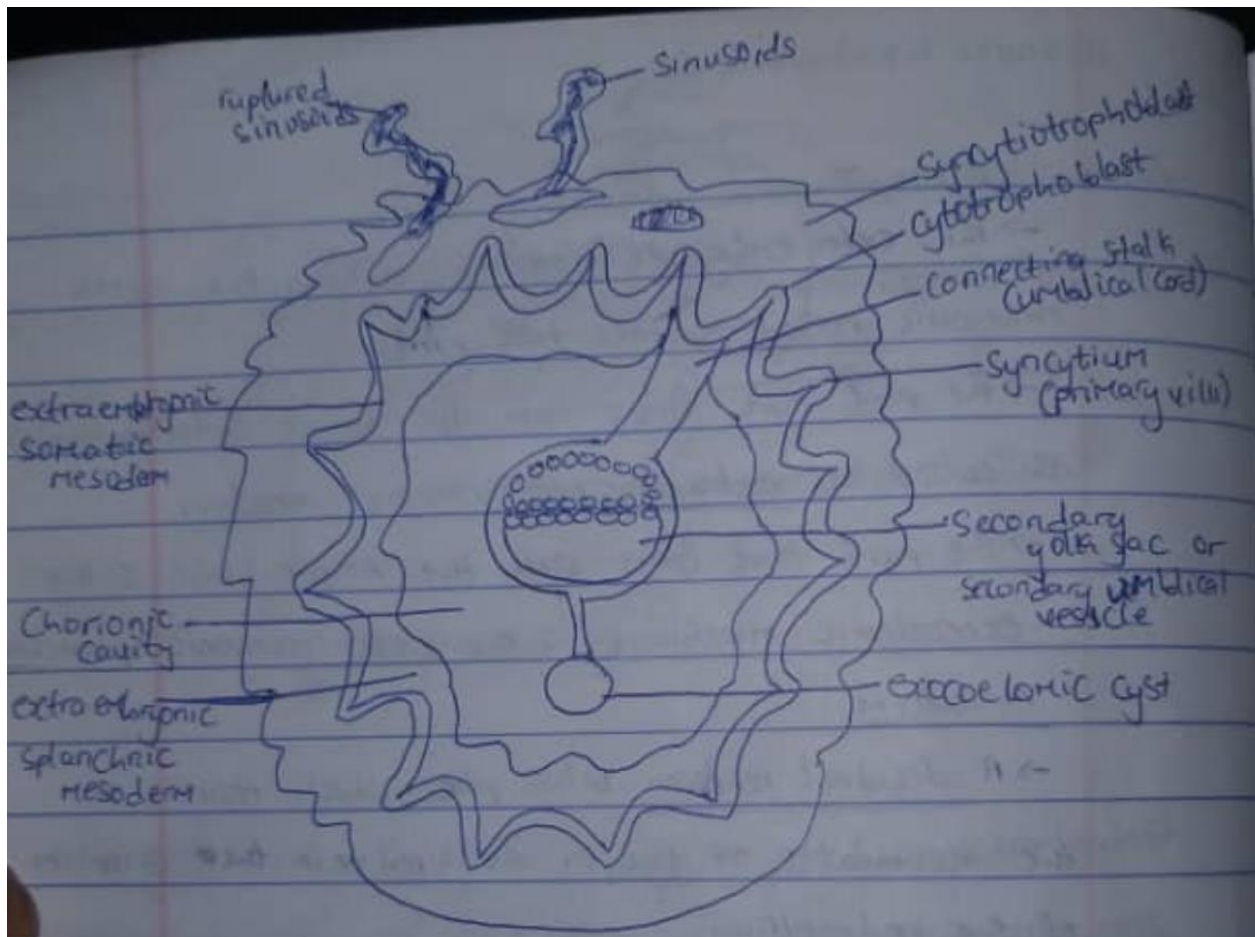
- The blastocyst is completely embedded in the endometrium.
- The blastocyst causes ruptured blood vessels (capillaries) called ruptured **sinusoids**.
- The ruptured sinusoids communicate with the trophoblastic lacunae helping in the transfer of nutrient, blood and oxygen to the blastocyst. At this stage, a **primordial uteroplacental circulation** is established.
- A space of mesoderm develops between the cytotrophoblast, Amnioblast, cytotrophoblast and the exocoelomic membrane; except in the connecting stalk. This space is called **extra embryonic mesoderm**.
- Cavities called **extra embryonic cavities** or **extra embryonic coelum** are formed in the extra embryonic mesoderm.
- The extra embryonic cavities divide the extra embryonic mesoderm into two parts:
 - i. The part that lines with the lower cytotrophoblast is called the **extra embryonic somatic mesoderm**.
 - ii. The part that lines with the Amnioblast and the exocoelomic membrane is called the **extra embryonic splanchnic mesoderm**.
- A decidual reaction takes place which results in the accumulation of glycogen and lipid in the cytoplasm of the endometrium.

- The function of the decidual reaction is to provide nutrition for the early embryo.



Day 13

- The cells of the cytotrophoblast grow into a syncytium giving rise to the villi. They are referred to as primary villi.
- The connective stalk gives rise to the umbilical cord.
- The exocoelomic cavity enlarges and gives rise to the chorionic cavity.



Clinical correlates

Extrauterine Implantation

- Blastocysts may implant outside the uterus.
- These implantations result in **ectopic pregnancies**.
- 95% to 98% of ectopic implantations occur in the uterine tubes, most often in the **ampulla** and **isthmus**.

