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Course Anatomy ( General Embryology 1)

Assignment: Discuss the second week of development

Answer

Three events takes place during the 2nd week of development

1. Completion of implantation of the blastocyst
2. Formation of bilaminar disc (Epiblast and Hypoblast)
3. Formation of the extra embryonic structure

Day 8

Completion of implantation of the blastocyst: This is when the blastocyst is partially embedded into the endometrium, the syncythroblast will continue to erode the endometrium together with the vessels while the cyntotrophoblast cell will continue to divide and migrate into the region of syncythroblast. The embryoblast (inner cell mass) will differentiate into two types of cells which is the Hypoblast layer which is made up of small of cuboidal cells and it is adjacent to the blastocyst cavity and Epiblast layer which is made up of high Columnar cells and it is adjacent to the amniotic cavity The hypoblast and epiblast layers together form a flat ovoid shaped disc called the bilaminar embryonic disc ,at the same time, a small cavity appears within the epiblast which enlarges to form the amniotic cavity. Epiblast cells adjacent to the cytotrophoblast are called amnioblasts

Amnioblasts together with the rest of the epiblast, line the amniotic cavity

The endometrium adjacent to the implantation site is edematous and highly vascular.

Day 9

The blastocyst is deeply embedded into the endometrium, the surface epithelium is closed by a fibrin coagulum . The Hypoblast lies adjacent to the cytotrophoblast to form a thin membrane called the exocoelomic membrane or Heuser membrane , the exocoelomic membrane together with the Hypoblast forms the exocoelomic cavity or primitive yolk sac or primary umbilical vesicle. There is a formation of tropoblastic lacunae

Day 10-12

The blastocyst is completely embedded into the endometrium. The cells of syncythroblast enters deeper and eroded the endometrium capillaries and the blastocyst continues to rupture the capillaries

Ruptured capillaries are called Sinusoid , the sinusoid communicates with thetrophoblastic lacunae leading to the bleeding in mother . This communication will establish **Primordial Uteroplacental Circulation** , when blood flows into the lacunae , Oxygen and nutritive substances are available to embryo .

The cell derived from the yolk sac are called **Extra embryonic mesoderm,** large cavities develops in the extra embryonic mesoderm to form a new space called extra embryonic cavity . The extra embryonic cavity differentiates into two (2)

1. The part that lies the mesoderm in the region of cytotrophoblast are called **Extra embryonic Somatic Mesoderm**
2. The part that lies the mesoderm in the region of the amnioblast and exocoelomic membrane are called **Extra embryonic Splachic Mesoderm**

As development continues, the endometrial tissues undergoes a transformation called *decidual reaction* , the endometrium swells as the day result of accumulation of glycogen and lipids , the cells are known as *decidual cells* and functions to provide nutrition for early embryo and immunological site of conceptual .

Day 13

The surface defects is covered completely by the surface epithelium, the extra embryonic cavity becomes wider to chronic cavity and the extra embryonic mesoderm lining the cytotrophoblast becomes chorionic plate , the only place the extra embryonic mesoderm transverse to chorionic cavity is the connecting stalk . The connecting stalk becomes the umbilical cord , the primary yolk sac becomes smaller to secondary yolk sac or secondary umbilical vesicles.

*Clinical Correlates*

***HCG – Human Chorionic Gonadotrophin*** is produced by the syncythroblast at the end of the 2nd week which enters the maternal blood by the lacuna to keep the corpus Luteum secreting oestrogen and progesterone. It maintains the hormonal activity of the ovary and it is basis of pregnancy test because it can be detected 10 days of pregnancy

***Extra uterine implantation*** – Blastocyst implant outside the uterus and it leads to ectopic pregnancy. 95%-98% of ectopic pregnancy occurs in the uterine tube mostly in the Ampulla.

Reference: DR OGEDENGBE O.O 1st – 3rd week of development slides