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DEPARTMENT: MEDICINE AND SURGERY

EMBRYOLOGY ASSIGNMENT

QUESTION:

DESCRIBE THE SECOND WEEK OF THE DEVELOPMENT

ANSWER:

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

1. Completion of implantation of the blastocyst
2. Formation of bilaminar embryonic disc(epiblast and hypoblast)
3. Formation of extraembryonic structures(amniotic cavity, amnion, umbilical vesicle [yolk sac], connecting stalk, and chorionic sac)

**Day 8**

* At the eighth day of development, the blastocyst is partially (slowly) embedded in the endometrium
* the syncytiotrophoblast continues its invasion of the endometrium, thereby eroding endometrial blood vessels and endometrial glands
* More cells in the cytotrophoblast divide and migrate into the syncytiotrophoblast, where they fuse and lose their individual cell membranes

**Day 9**

* The blastocyst is more deeply embedded in the endometrium, and the surface epithelium is closed by a fibrin coagulum
* Vacuoles appear at the region of the trophoblast and they fuse to form lager lacunae and this phase of trophoblast development is known as the lacunar stage
* the cells of the hypoblast adjacent to the cytotrophoblast form a thin membrane called the exocoelomic (Heuser’s) membrane and this membrane lines the inner surface of the cytotrophoblast
* the exocoelomic (Heuser’s) membranetogether with the hypoblast forms the lining of the exocoelomic cavity,orprimitive yolk sacor primary umbilical vesicle

**11th** - **12th day of development**

* 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
* A new population of cells appears between the inner surface of the cytotrophoblast and the outer surface of the exocoelomic cavity. These cells which are derived from yolk sac cells form a fine, loose connective tissue called the extraembryonic mesoderm
* Soon, large cavities develop in the extraembryonic mesoderm, and when these become confluent, they form a new space known as the extraembryonic cavity, or chorionic cavity or extraembryonic coelom. This space surrounds the primitive yolk sac and amniotic cavity, except where the germ disc is connected to the trophoblast by the connecting stalk
* The extraembryonic mesoderm lining the cytotrophoblast and amnion is called the extraembryonic somatic mesoderm
* the lining covering the yolk sac is known as the extraembryonic splanchnic mesoderm

**13th day of development**

* The surface defect in the endometrium has been completely covered by the surface epithelium
* Cells of the cytotrophoblast proliferate locally and penetrate into the syncytiotrophoblast, forming cellular columns surrounded by syncytium
* The primary yolk sac becomes reduced in size and is known as the secondary yolk sac and 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 fetus 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