NAME: EGBUNIWE KOSISOCHUKWU OGECHUKWU

MATRIC NUMBER: 18/MHS01/134

DEPARTMENT: MEDICINE AND SURGERY

LEVEL: 200

SECOND WEEK OF DEVELOPMENT

Three events take place during the second week of development

1. Completion of implantation of blastocyst.
2. Formation of bilaminar embryonic disc (epiblast and hypoblast).
3. Formation of extra embryonic structures.

DAY 8

* Blastocyst is partially embedded in the endometrium.
* The syncytiotrophoblast continues to enrol in the endometrium.
* The cells of the cytotrophoblast divide and migrate into the region of the syncytiotrophoblast.
* The embryoblast divides into two layers :

1. Hypoblast made up of small cuboidal cells.
2. Epiblast made up of high columnar cells.

* The hypoblast and epiblast join to give rise to bilaminar embryonic disc.
* Epiblast cells adjacent to the cytotrophoblast are called amnioblasts.
* Amnioblasts together with the rest of the epiblast line the amniotic cavity.

DAY 9

* The blastocyst is deeply embedded in the endometrium, and the penetration defect in the surface epithelium is closed by a coagulum called fibrin.
* Vacuoles appear at the region of the trophoblast and they fuse to form lager lacunae
* 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 or heuser’s membrane
* this membrane lines the inner surface of the cytotrophoblast
* The exocoelomic membrane together with the hypoblast forms the lining of the exocoelomic cavity,orprimitive yolk sacor primary umbilical vesicle.

DAY 11 – 12

* 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.
* These ruptured endometrial capillaries are called sinusoids
* The lacunae then begin to communicate with the sinusoids, and maternal blood enters the lacunar system.
* The communication of the eroded endometrial capillaries with the lacunae establishes the primordial uteroplacental circulation.
* When maternal blood flows into the lacunae, oxygen and nutritive substances are available to the embryo.
* 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,orchorionic 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.
* As the conceptus implants, the endometrial connective tissue cells undergo a transformation, called decidual reaction
* During this transformation, the cells of the endometrium swell because of the accumulation of glycogen and lipid in their cytoplasm, and they are known as decidual cells.
* The primary function of the decidual reaction 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 sacordefinitive yolk sacor 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.
* 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, 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.