
Implantation of embryo in human

Definition: Implantation is a process in which developing blastocyst (modified fertilized ovum) get itself loosely attached (implanted) to the definite area on intra uterine wall or endometrium.

Time of Implantation: After reaching the uterus, the developing blastocyst usually remains in the uterine cavity for 1 to 3 days before it implants in the endometrium. On 6th to 7th day after fertilization blastocyst touches the endometrial wall & on 12th day it becomes properly implanted.

Site of Implantation: Blastocyst is implanted at fundus of the uterus or any part of the body of uterus.

Process of Implantation of the Blastocyst in the Uterus:

Fertilized ovum or zygote through rapid and repeated mitotic cell division is transformed into cell mass or morula. After fertilization has occurred, an additional 3 to 5 days is normally required for transport of the fertilized ovum through the remainder of the fallopian tube into the cavity of the uterus. This transport is effected mainly by a feeble fluid current in the tube resulting from epithelial secretion plus action of the ciliated epithelium that lines the tube; the cilia always beat toward the uterus. Weak contractions of the fallopian tube may also aid the ovum passage. Within uterus morula transforms into a 100 cell blastocyst. Spending freely (unattached) 3 to 6 days, blastocyst is now implanted on the uterine endometrium.

Before implantation, the blastocyst obtains its nutrition from the uterine endometrial secretions, called “uterine milk.” Implantation results from the action of *trophoblast cells* that develop over the surface of the blastocyst. These cells secrete proteolytic enzymes that digest and liquefy the adjacent cells of the uterine endometrium. Some of the fluid and nutrients released are actively transported by the same trophoblast cells into the blastocyst, adding more sustenance for growth. . Once implantation has taken place, the trophoblast cells and other adjacent cells (from the blastocyst and the uterine endometrium) proliferate rapidly, forming the placenta and the various membranes of pregnancy.

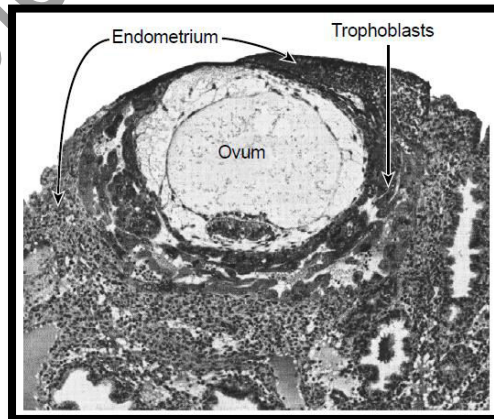


Fig: an early implanted human blastocyst, with a small embryo showing trophoblastic digestion and invasion of the endometrium.

Effects of hormones in Implantation of Embryo:

Estrogen & progesterone hormones secreted from the ovary under the influence of FSH & LH, help in the growth of the intra uterine endometrial layer and prepare it for implantation.

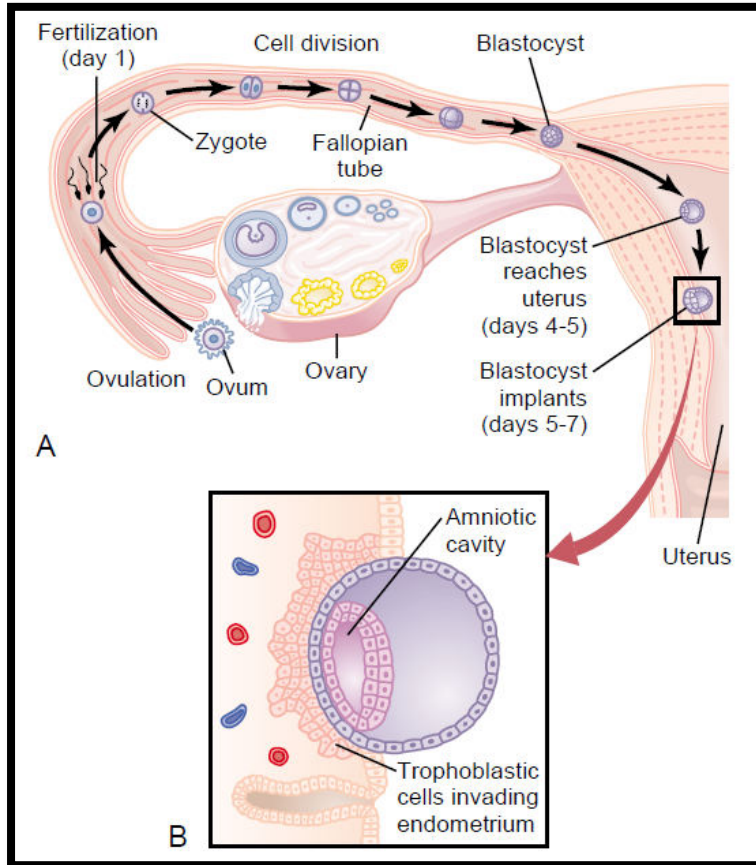


Fig: A, Ovulation, fertilization of the ovum in the fallopian tube, and implantation of the blastocyst in the uterus. **B**, Action of trophoblast cells in implantation of the blastocyst in the uterine endometrium.