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 IMPLANTATION

Implantation is defined as the process by which the embryo attaches to the endometrial surface of the uterus and invades the epithelium and then the maternal circulation to form the placenta. Before the initiation of implantation, however, both embryo and endometrium should embark on an elaborated process in a time- and location-specific manner.

Implantation, in reproduction physiology, the adherence of a fertilized egg to a surface in the reproductive tract, usually to the uterine wall (see uterus), so that the egg may have a suitable environment for growth and development into a new offspring. Fertilization of the egg usually occurs after the egg has left the ovary and is being transported through the fallopian tubes. Male sperm cells deposited in the female reproductive tract travel up to the fallopian tubes to unite with the egg. Once fertilized, the egg begins to undergo a series of cell divisions. The egg takes up to seven days to reach the uterus; by this time the single-celled egg has divided numerous times, so that it is a ball of approximately 200 cells.

The uterus has thick walls suitable for egg attachment and growth. A female hormone known as progesterone, secreted by the corpus luteum in the ovary, influences the readiness of the uterine wall for egg implantation. It increases the blood supply in the wall, water content, and secretion of glycogen, a nutrient for the surrounding tissue and developing egg. If the uterus is not first prepared by progesterone, the egg will not attach itself. Progesterone also inhibits muscular contractions in the uterine wall that would tend to reject the adhering egg.

When the egg reaches the uterus, it usually remains free in the uterine cavity for about a day. It then attaches to the uterine lining (the endometrium). Cells in the outer surface of the egg grow rapidly once contact is made with the uterine wall. The egg disrupts the surface of the endometrium and actively burrows into the deeper tissue. By the 11th day after fertilization, the egg has completely embedded itself into the endometrium. The product of conception—first the fertilized egg and then the developing child and the placenta—normally remains implanted in the human uterus for nine months

Symptoms of Successful Implantation

The first stage of pregnancy is when a sperm cell fertilizes the egg cell. After this, the cells begin to divide and increase in number. After approximately five days, the embryo will reach the blastocyst stage. The blastocyst then burrows itself into the uterus wall, which is when successful implantation occurs. When implantation occurs, some women will experience symptoms. These are:

1. Cramps. When the embryo implants, you might feel some discomfort. Every woman is different, so not everyone feels stomach cramps. Unlike pre-menstrual cramps, the sensation is typically mild and will only last a day or two.
2. Spotting. Spotting is also known as implantation bleeding. Some women experience spotting between 10 to 14 days after conception, which is around when you will expect your period.

Signs of Successful Implantation

Implantation is the sign that your fertility treatment has been a success and you may become pregnant. However, everyone is different – so there are a few more symptoms that some women may experience. Below, we list some other symptoms of successful implantation

1. Sensitive breasts. After implantation, you might find that breasts appear swollen or feel sore. This happens because of changes in your hormone levels.
2. Mood swings. You might feel emotional compared to your usual self, which is also due to changes in your hormone levels.
3. Bloating. Although feeling bloating usually happens before your period, it can also be a sign of pregnancy.
4. Changing tastes. Pregnancy can make you adverse certain tastes or smells.
5. Blocked nose. As your hormones level adjust, it can cause mucous membranes to swell. Some women also experience nose bleeds.
6. Constipation. Hormonal changes can also change your digestive system, causing constipation or indigestion.

Implantation stage

Implantation consists of three stages:

(a) the blastocyst contacts the implantation site of the endometrium (apposition);

 (b) trophoblast cells of the blastocyst attach to the receptive endometrial epithelium (adhesion); and

 (c) invasive trophoblast cells cross the endometrial epithelial basement membrane and invade the endometrial stroma (invasion)

The site of implantation

The implantation normally takes place in the superior and posterior walls of the uterine body (corpus uteri) in the functional layer of the endometrium during the secretory phase of the cycle. Normal implantation zone of the blastocyst in the superior and posterior wall of the uterine cavity