

Blastocyst Transfer



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Background

A blastocyst is an embryo that consists of around 100 cells. It is at the blastocyst stage of development (5 days after fertilization) that an embryo would normally move out of the uterine tube and into the uterus. Once in the uterus, the blastocyst starts to attach to the uterine lining in a process known as implantation.

In IVF/ICSI cycles embryo transfer has been routinely performed on day 2 or 3 of culture when an embryo consists of 4 to 8 cells. This tradition arose from the idea that in vitro culture for extended periods might be harmful to the future growth of the embryo. This problem has now been overcome by the development of culture media that takes into account the changing nutritional requirements of the embryo as it develops.

Research shows that human embryos can now be cultured to the blastocyst stage without reducing implantation and pregnancy rates.

Benefits of blastocyst transfer

There is now evidence from research studies that although embryos may have a normal appearance, up to 70% can be chromosomally abnormal. Studies also show that the majority of embryos that fail to develop past the 8-cell stage are chromosomally abnormal, so that, extending culture to the blastocyst stage may mean that more of the

surviving blastocysts available for transfer have normal chromosomes. However, there is no guarantee that embryos that do develop to the blastocyst stage are genetically normal.

In contrast to embryo transfers that take place 2 or 3 days after egg collection and fertilization, blastocyst transfer places the embryo into the uterus at a later stage (day 5 or 6) which approximates the time an embryo would normally arrive in the uterus. This may allow a better harmony between embryo development and the uterine environment.

Using specially developed culture media, a higher implantation rate has been observed following transfer of blastocysts (50%), compared to day 3 (25%) embryo transfer. Research shows that pregnancy rates after blastocyst transfers are either increased or stay the same, when compared to day 2 or 3 transfers. This research suggests that blastocyst transfer should enable transfer of only one embryo without reducing pregnancy rates.

Concept's results now show that the pregnancy rates are similar between day 3 and blastocyst transfers, but a reduction in the number of high-order (triplets etc) multiple pregnancies was evident in the blastocyst transfer group.

Disadvantages of blastocyst transfer

It is possible that up to 15% of patients will not have a blastocyst available to transfer. In these cases the embryos have failed to develop to the blastocyst stage. It has been shown that only 50% of embryos will develop to the blastocyst stage. There is however, evidence that if no embryos have developed to the 8-cell stage on day 3 of culture, there is no advantage gained by extending culture to the blastocyst stage. This research shows that day 3 transfers in these cases results in a 30% pregnancy rate compared to 0% if culture is extended to the blastocyst stage. To avoid the disappointment of having no blastocysts to transfer on day 5 or 6, we advise that when no 8-cell embryos have developed by day 3, the best available embryo is transferred on this day rather than extending culture to the blastocyst stage.

The number of embryos suitable for freezing is reduced following blastocyst culture. As a consequence, the possibility of frozen embryo transfer should the fresh transfer be unsuccessful is also reduced.



A blastocyst on day 5



A hatched blastocyst

A blastocyst is formed when an embryo reaches the 5 to 6 day developmental stage and is a sphere consisting of an inner cell mass, an internal fluid filled cavity, and an outer layer of cells (the trophoblast).

The inner cells mass will form the fetus and the trophoblast cells will form the placenta. A blastocyst must hatch (from the zona pellucid) before it can attach to the lining of the uterus during implantation which occurs 6 to 7 days after fertilization.

Patients who use the blastocyst transfer procedure cannot undergo GIFT. It can only be performed in association with IVF/ICSI (Reference IVF/GIFT Information Sheets).

There is an extra fee for couples who wish to use blastocyst transfer above what is normally charged for IVF/ICSI. Please speak to the Nurse Coordinator who will discuss this with you before you commence treatment.

Patients likely to benefit from blastocyst stage transfer

Those patients at risk of multiple pregnancy. For example, patients 35 and under with 6 or more embryos.

Those patients who have had repeated implantation failures (3 or more). In these cases blastocyst culture may offer the advantage of allowing transfer of embryos that are more likely to be genetically normal, and therefore have better chance of developing into a successful pregnancy.

Birth outcomes following blastocyst transfer

An analysis of over 500 pregnancies and births showed no increase in the incidence of abnormalities following transfer of blastocysts. In this analysis the number of abnormalities was 11/510 (2.3%) and the majority of these were trisomies (abnormal number of chromosomes). These abnormalities were associated with advanced maternal age (37 – 43 years).

Another study showed that there were no overall differences in birth weight observed between infants born after blastocyst transfer compared to those born after natural conception. Interestingly, birth weights of girls born after transfer of frozen-thawed blastocysts were slightly higher than the normal population (3.416g vs 3.331g respectively). This analysis also showed that blastocyst transfer can potentially alter the sex ratio with more boys born after fresh blastocyst transfer. The transfer of blastocyst that had been frozen and thawed did not alter the sex ratio (51.9% boys: 48.1 girls).

Management of a blastocyst transfer cycle

Blastocyst transfer will normally take place on day 5 or 6 after egg collection depending on blastocyst development. In the situation where no 8-cell embryos are available on day 3, a transfer may occur on this day.

Should you require any further information please contact the Doctor at Concept.

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