



## Womb transplantation and fertility

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### Abstract

Uterine transplantation is comparatively a new innovation in the field of medical science. Its importance lies in the point that it enables a woman with a defective uterus or in whom the uterus is absent congenitally to have the blessings of delivering their own children. Unlike any other organ transplantation, the womb transplantation has its own peculiarity due to two distinct reasons. Firstly; it requires continuous immunosuppressive therapy so long as the recipient carries the transplanted womb immediately after the delivery of one/ two children. Uterine transplantation is a complex procedure surrounded by medical, psychological, ethical, moral and cultural concerns. It will be successful only if the uterus functions properly in the recipient's body and also able to give birth to a child.

**Keywords:** transplantation, Uterine, medical science, fertility

### Introduction

To have a child is a gifted thing in human life. However, some people are not lucky enough to have children. The reason may vary from different infertility issues which include the absence of womb either congenitally or due to some other medical issues. The womb transplantation, which is comparatively of recent development in the medical world, provides a ray of hope to the childless couples. In uterine transplantation surgery, not less than four parties are involved – recipient, donor, partner of the recipient and future child.

In the field of organ transplantation, it is believed that the solution for organ transplantation is only relying on the live or brain dead donors (which report only 1% of all deaths). However the recent advancements in the field of medicine help to solve this issue through organ revitalization from recently dead donors. The organs from the immediate dead bodies can be recovered and transplanted to the recipient by using lab perfusion devices. With the help of these devices, deliver body temperature and oxygenated blood with an appropriate amount of hormones and nutrients and will be able to recover the organs into a transplantable form. This technology would help to eradicate the organ shortage to some extent.

### Conceptualization of womb transplantation

Womb transplantation is the operative procedure in that a healthy womb will be transplanted into a female human being when the uterus is absent (Mayer–Rokitansky–Kuster–Hauser (MRKH) syndrome) or diseased (like: Asher man's syndrome, pregnancy interfering myomas). In case of normal mammalian sexual reproduction, an unhealthy or absent uterus will not allow embryos to grow. Womb transplantation offers great hope for women who do not have a uterus.

### Womb transplants to date

In 1960, the first pelvic organ transplantation was performed in an animal. The uterus was transplanted along with the fallopian tube. The development of in vitro fertilization in

the field of medicine reduced the interest of fallopian tube transplantation. In 2002, the first human uterine transplantation was performed in Saudi Arabia and it became a failure because of graft rejection after three months and it ended in hysterectomy. Womb transplantation has been carried out in countries like Saudi Arabia, Turkey, Sweden, US, China, Brazil, Germany, India etc. In 2011, the second attempt has been done in Turkey & resulted in two pregnancies and both ended with a miscarriage. In 2014, the world's first baby (boy) was born with the help of transplanted uterus in Gothenburg, Sweden. In 2015, UK got approval for 10 uterine transplantation. But now the surgeons are planning to do the first womb transplantation before the end of 2018. In 2017, the woman from the US received uterus from deceased donor & gave birth to a baby and this was the first successful procedure in the US. In India first uterine transplantation surgery was done on 18<sup>th</sup> May 2017 at Galaxy Care Hospital in Pune, Maharashtra. Worldwide 42 women have received transplanted wombs and 11 babies were born with the help of transplanted womb out of these eight babies were in Sweden

### Criteria of donor

The donor should be a female of reproductive age group. She should not have any other contraindication to this procedure. She has to complete her family. Need consent for donating the organ. The donor may be brain dead, deceased or live donors (mother/ sister of the recipient)

### Criteria of recipient

The recipient has to be genetically female with no contraindications to the uterine transplantation procedure. She should be suitable for motherhood and psychologically fit. The risk of the procedures should be explained to the recipient.

### Procedure

In uterine transplantation surgery, surgeons take out the uterus, cervix and part of the vagina along with small uterine vessels, which will help to take blood to the organ,

from the donor (live or recently died). The retrieved uterus can survive 6 -8 hours outside the body if kept cold (2- 8 degree). The retrieved uterus will be connected with the recipient's vagina and uterine vessels, which will help to redirect the blood from large blood vessels running outer the pelvis. The recipient's ovary will not be removed and not connected with the fallopian tube of donor uterus. After the transplantation surgery recipient has to wait for one year to heal the wound and to recover the health. The recipient has to undergo three major surgeries like transplantation surgery, caesarean section and hysterectomy.

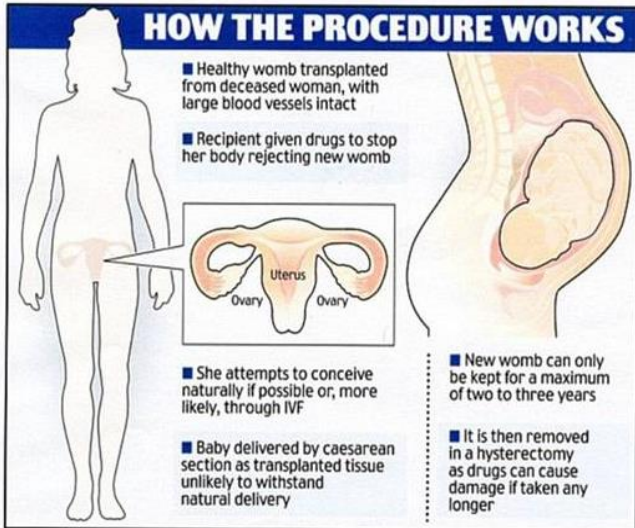


Fig 1

**Steps of uterine transplantation**

The transplantation surgery will take 6-7 hours to complete. After surgery, the recipient has to take immunosuppressant drugs throughout the life to prevent the chance of rejecting the donor organ. Then the women should wait for one year to heal the wound and throughout the year women's health has to be monitored. Once the wound gets healed and after regaining of health woman can undergo IVF procedure-the embryo will be the combination of that woman's egg and partner's sperm. If the woman is getting pregnant and in between no other complication is there the baby will be delivered through caesarean section by eight month. Couples will get a chance to have two babies with the help of transplanted womb. After that, the uterus will be removed. After the hysterectomy woman can stop immunosuppressant therapy.

**Advantages**

- Help to restore the fertility
- Expected excellent outcomes
- Chance of getting genetically own child.
- The psychological satisfaction of physically bearing their own child

**Disadvantages**

- Risk of morbidity or mortality
- Haemorrhage
- Infection
- Rejection of graft
- Delay in wound healing
- Difficult to obtain the uterine blood vessels which run beside the pelvic floor.

- Medical complications such as graft rejection, opportunistic infections, cancer etc.
- Immunosuppressive drug side effects such as renal toxicity, hypertension, diabetes, weight gain, blood count disorders, gastrointestinal disturbances & mental status changes.
- The risk of opportunities infections or cancers while on immunosuppressive medicine is low, but not zero.
- Immuno suppressants affect fetus like prematurity, growth retardation, congenital abnormalities etc.

**Conclusion**

Uterine transplantation is not just about surgery and moving a uterus from donor to the recipient. It is a hope for infertile couples to have a healthy baby. In other words, it is for offering an alternative to have children for women who thought they would never be able to have children.

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