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UTERINE TRANSPLANTATION: LITERATURE REVIEW

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Up to 15% of the reproductive population is infertile, and 3 to 5% of all cases of infertility are due to absolute uterine factor infertility (AUFI) i.e. infertility secondary to the absence of a uterus or the presence of one that is anatomically or physiologically dysfunctional. This abnormality generally leads women to consider surrogacy or adoption. However, in many countries, such as Japan and Sweden, surrogacy is heavily restricted or even prohibited. Uterine transplantation(UTx), although still experimental, may be an option in these cases. UTx is an emerging therapy that is transitioning from an experimental phase to an established clinical practice, with some centers beginning to perform the procedure outside of clinical trials. The first human uterine transplantation was performed in 2002 in Saudi Arabia but resulted in graft loss and hysterectomy 3 months after transplantation. The second attempt at uterine transplantation occurred in Turkey in 2011 and resulted in two pregnancies, both ending in miscarriages. The first case with successful childbirth was reported in September 2014 among nine transplant patients in Gothenburg, Sweden. As of 2021, there have been more than 31 babies born following this procedure, with an increasing number of research programs being set up around the globe.

Potential recipients to undergo UTx are women of reproductive age with AUFI, the causes of which may be congenital (e.g., mullerian agenesis) or acquired (e.g., obstetrical). Jones BP et al. (2021) observed that out of the 45 reported cases, 40 (89%) were performed in women with Mayer–Rokitansky–Kuster–Hauser syndrome. 4 (9%) cases were undertaken following hysterectomy. 1 (2%) case was undertaken in a woman with Asherman syndrome who underwent preparatory hysterectomy at the time of UTx.

UTx centers must decide early on to adopt a living donor (LD) model, deceased donor (DD) model, or a hybrid model. In a LD model, donors can be categorized by their relationship to the recipient, either known i.e. “directed” (mostly mothers) or anonymous i.e. “non-directed”. Jones BP et al. (2021 reported LD have been used in 80% of UTx cases performed so far (n=36), while the remaining cases used DD (n=9; 20%). Compared to DDs, LDs allow for a more thorough medical evaluation of the donor and more control in timing of the procedure. However, a LD model involves risks of physical and psychological harm to the donor.

There is no consensus regarding criteria for donor selection. A history of infertility, recent cancer diagnosis, and chronic medical conditions that compromise graft survival, recent infections, and fibroids are all criteria cited in protocols to restrict donor selection in a UTx study.

Complications can occur in both the recipient and in the LD. Reported complications in the LD include hemorrhage requiring reoperation, vaginal cuff dehiscence, and postoperative pain. A 5–14 % frequency of ureteric injury including fistula is the most frequent complication. There is also an increased risk of mental health–related quality of life issues in women that have donated their uterus to a recipient who did not have a successful outcome from the transplant. In the recipient, the most common reason for graft removal is thrombosis of the artery or vein (overall vascular complication rate is around 20%).

Brannstrom M et al., 2015 reported use of IV anti-thymocyte globulin just before surgery and 12 h later and 500 mg methylprednisolone – Induction treatment, Tacrolimus and mycophenolate mofetil (MMF) during the first 6 months with withdrawal of MMF after 6 months and addition of azathioprine and prednisolone as maintenance and just corticosteroids as rejection treatment.

In 2021, Jones et al. reported 23 live births following UTx; 20 from living donor and three from deceased donor operations. Outcomes have been published from 17 of these cases. Antenatal complications included pre-eclampsia (n = 3), cholestasis of pregnancy (n = 2) and preterm prelabour rupture of membranes (n = 1).