

Ethics around Uterine Transplantation: Catholic Perspectives

關於子宮移植的倫理：天主教之觀點

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摘要：當一位天生沒有子宮的女士在2014年瑞典從移植的子宮誕下小孩時，大家都對這新的生育科技產生濃厚的興趣。雖然天主教會支持生命文化，但教會在生育科技的倫理範疇上，比世俗的觀點更為嚴謹。這篇文章嘗試以不同角度作子宮移植的倫理分析，包括一般醫學上的觀點，例如蒙特利爾標準和活體相對已故捐贈者的問題。也會討論天主教會的觀點，例如人性尊嚴和夫妻行為及生育意義的不能被分開。在最後也會輕輕提及在這一範圍的生育技術發展，它有望讓沒有子宮的女士受惠於更符合倫理規範的生育程序。

關鍵詞：子宮、移植、生育技術、不育

Abstract: *When a baby was delivered through a transplanted uterus from a female born without one in Sweden in 2014, a lot of interest had been aroused in this reproductive technology. While the teaching of the Catholic Church is pro-life, the ethical perspectives of the Church on reproductive medicine is more stringent than the secular ones. In this article, the many aspects of ethical issue on uterine transplantation would be discussed, including the ordinary medical criteria, Montreal Criteria and the use of live versus deceased donor, as well as the more Catholic perspectives such as the dignity of a person and the inseparability of marriage act and procreation. At the end, there is a touch on research in this area that may provide a more ethically feasible reproductive solution for female with no uterus.*

Keywords: *uterus, transplant, reproductive technology, infertility*

1. Introduction

From the first chapter of Genesis, God blessed man and woman saying “Be fruitful and multiply, and fill the earth and subdue it...,” (Gen1:28) it has long been considered that children from marriage be an important gift and blessing from God. Procreation is even considered the primary good of marriage, what separate marriage from other interpersonal relationships. However, not every marriage is endowed with children, and infertile couples suffer greatly. “What will you give me,” asked Abraham of God, “for I continue childless?” (Gen 15:2) and Rachel cried to her husband Jacob, “Give me children, or I shall die!” (Gen 30:1). This suffering could be particularly agonizing when there seems to be no hope of reversing it. However, in these recent few years, a new procedure has caught the attention of all those practicing reproductive medicine as well as ladies who want children but with the misfortune of not having a womb (uterus). As the Catholic Church has always been pro-life in her teachings, does that mean rectifying a sterile condition would always be good? Would there be a limit in adopting such a procedure? In the following pages, I would like to discuss the Catholic perspectives on the ethics of this new procedure in reproductive medicine—uterine transplantation.

2. Background

2.1 Background of Uterine Transplantation

There are different causes for infertility of couples. Approximately a third¹ of the causes are attributed to the male side and is called

1 Mayo Clinic, *Infertility* (Mayo Clinic Minnesota, 17 Aug 2017), <https://www.mayoclinic.org/diseases-conditions/infertility/symptoms-causes/syc-20354317> [Accessed Oct 16, 2017].

the male factor. Another third of the causes are related to the female side and thus the term female factor. The remaining third is either a combination of the male and female factors or unknown causes. Among the female factors, the most common one is ovulation disorder, accounting for infertility in a quarter² of infertile couples. Fallopian tube damage or blockage and endometriosis are the others of the top three female factors. Uterine and cervical factors, pelvic adhesion, primary ovarian failure, cancer and its treatment, other medical condition such as diabetes, autoimmune disorders, genetic disorders etc. constitute the rest of the female causes.³ For infertility attributed to uterine factors (UFI), about 3-5%⁴ of all infertility, it could be uterine fibroid, polyps, adhesion or scarring (usually related to previous instrumentations or infection), or distorted shaped or anatomy of uterus. But when it is called absolute uterine factor infertility (AUI), it means absence of uterus (congenital or post-hysterectomy) or non-function of a uterus.

The uterus is developed embryonically from the Mullerian duct. This structure in the embryo develops into the uterus, fallopian tubes, cervix, and the upper part of the vagina. There will be congenital absence of uterus and vagina if there is absence of development of this Mullerian duct. This condition could be called by different names:

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- 2 Mayo Clinic, *Female Infertility* (Mayo Clinic Minnesota, 24 Nov 2016), <https://www.mayoclinic.org/diseases-conditions/female-infertility/symptoms-causes/syc-20354308> [Accessed Oct 16, 2017].
 - 3 Mayo Clinic, *Infertility* (Mayo Clinic Minnesota, 17 Aug 2017).
 - 4 Jacques Milliez, "Uterine transplantation FIGO Committee for the Ethical Aspects of Human Reproduction and Women's Health," *Int J Gynaecol Obstet* 106, no. 3 (2009): 270.

Mullerian agenesis, Mullerian aplasia, Mullerian dysgenesis, genital renal ear syndrome, Rokitansky Kuster Hauser syndrome, Rokitansky syndrome or Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome.⁵

Ladies with MRKH syndrome have female chromosome pattern (46XX) and functioning ovaries. They have normal external female sexual characteristics. When only the reproductive system is affected, it is classified as MRKH syndrome type 1. If there are other abnormalities, it is called type 2. In MRKH syndrome type 2, the kidney is commonly found abnormally formed or positioned; other abnormalities may include skeletal problems, hearing loss or heart defects. MRKH syndrome is estimated to affect 1 in 4,500 newborn girls.⁶ The cause of the syndrome is unknown, most of the patients do not have a family history of the disorder.

When a case of infertility is classified as absolute uterine factor infertility, it used to mean it is non-amendable to medical treatment. The option remains would be adoption; or, for non-Catholics, surrogacy in some countries. In the development of radical abdominal trachelectomy, a fertility-sparing procedure to treat early-stage cervical cancer, it was found that pregnancy was possible despite the fact that the uterus was only supplied by two vessels and interests in the possibility of uterine transplantation was aroused.⁷ Without prior

5 US National Library of Medicine, *Mayer-Rokitansky-Küster-Hauser syndrome* (Genetic Home Reference, 1 May 2017), <https://ghr.nlm.nih.gov/condition/mayer-rokitansky-kuster-hauser-syndrome#synonyms> [Accessed Oct 16, 2017].

6 *Ibid.*, under “frequency.”

7 Benjamin Jones et al., “Uterine transplantation: past, present and future,” *BJOG* 123, no. 9 (2016): 1434.

animal studies,⁸ the first case of uterine transplantation in human was done in 2000, Saudi Arabia. The 46-year-old live donor suffered a perioperative ureteric laceration. The 26-year old recipient who had undergone peripartum hysterectomy 6 years earlier had the new uterus for 99 days before it had to be removed because of uterus necrosis, probably due to inadequate structural support of uterus leading to tension and thrombosis of supplying vessels. The second human attempt on uterine transplantation was done in Turkey 2011 using a brain-dead donor.⁹ The recipient was a 21-year old patient suffered from MRKH syndrome. The donor was a 22-year old multi-organ donor. The uterus was the first organ procured in the donation process! Eighteen months after the transplant, multiple in-vitro fertilization (IVF) and embryo transfer were attempted, but there were only two very early miscarriages resulted. The investigators attributed it to the fact that the donor uterus was a nulliparous one and its capability to carry a pregnancy had not been proven. The Sweden team led by Professor Mats Brännström, at Sahlgrenska Academy performed the third to eleventh uterine transplantation using live donor with first baby born in 2014. They had a total of nine transplantations in this series (study1) done between September 2012 and April 2013¹⁰ with prior researches on small to domestic non-primate animals. For these 9 recipients, eight had congenital absence of uterus, the remaining one had a radical hysterectomy because of cervical cancer.¹¹ The donors

8 Mats Brännström, "Uterus transplantation and beyond," *J Mater Sci: Mater Med* 28, no. 70 (2017): 1.

9 Munire Erman Akar et al., "Clinical pregnancy after uterus," *Fertil Steril* 100 (2013): 1359.

10 Pernilla Dahm-Kähler, Cesar Diaz-Garcia, and Mats Brännström, "Human uterus transplantation in focus," *British Medical Bulletin* 117 (2016): 74.

11 Brännström, "Uterus transplantation and beyond," p. 4.

were mothers in five cases, one sister, one maternal aunt, one mother-in-law and one close friend. There were two grafts loss, one uterus had to be removed after 3 days because of bilateral thrombosis of uterine vessels, and the other uterus was removed 3.5 months after surgery because of intrauterine infection, abscess formation and septicemia not amendable to antibiotic treatment. For the remaining 7 transplanted uteri, 5 out of 7 had mild rejection. A total of nine births had resulted from these 7 patients.

With the news of first live birth from uterine transplantation in 2014, interest all over the world is spurred. Countries such as Japan, France, UK and Australia are all preparing to embark on their first uterine transplantation trial,¹² while at least another 12 failed transplant attempts were already performed by 2017 in human in China, Czech Republic, Brazil, Germany and the United States.¹³ Most of the performed transplantation used live donors. From what could be registered worldwide through conferences, there were at least 38 uterine transplantations performed by 2017.¹⁴ Ten of these 38 uteri were from deceased donor while the remaining 28 from live donors. It was commented that 25% of uteri were explanted, the main causes being thrombosis or infection. China reported the first robotic assisted uterine transplantation done in 2016 where the graft still survives after 12 months even though pregnancy has not yet been

12 Nicola Williams, "Should deceased donation be morally preferred in uterine transplantation trials," *Bioethics* 30, no. 6 (2016): 416.

13 Luis Arturo Ruvalcaba Castellón et al., "The history behind successful uterine transplantation in humans," *JBRA Assisted Reproduction* 21, no. 2 (2017): 126.

14 Telegraph, *The womb transplant confirms its promises* (Telegraph, 4 Oct 2017), <http://www.turkeytelegraph.com/life-style/the-womb-transplant-confirms-its-promises-h4701.html> [Accessed Oct 22, 2017].

reported.¹⁵ The Sweden team has embarked on another series of 8 patients using robotic assisted approach (study 2) to harvest the uterus in 2017, the first transplant of this series was performed in May 2017, and the first live birth from robotic assisted transplantations was born in April 2019.¹⁶

2.2 What is Uterine Transplantation?

Uterine transplantation is a time-consuming procedure consisting of harvesting the uterus from a donor with the associated vascular supply and drainage and transplanting it to the recipient. Traditionally through an infraumbilical midline incision,¹⁷ the donor uterus and bilateral fallopian tubes are dissected and isolated with the ligament that is important to hold the graft in its proper position after transplantation. The uterine arteries and veins need to be carefully dissected and separated from the ureters. The uterine vessel branches are cut along with a small patch from the iliac vessels. The donor vagina is sectioned to allow adequate length for anastomosis to the recipient. Since the uterus is a pelvic organ in close proximity with the urinary bladder in front and the sigmoid colon behind, with the ureters travelling at its sides before entering the urinary bladder, injury to surrounding structures is a well-known complication and isolating fine vessels in the narrowed space of pelvic cavity is technically demanding.

15 Wei Li et al., “Modified human uterus transplantation using ovarian veins for venous drainage: the first report of surgically successful robotic-assisted uterus procurement and follow-up for 12 months,” *Fertil Steril* 108, no. 2 (2017): 346.

16 Mats Brännström, “Live birth after robotic-assisted live donor uterus transplantation,” *AOGS* 99, no. 9 (2020): 1222, <https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/aogs.13853> [Accessed Sept 19 2020].

17 Brännström, “Uterus transplantation and beyond,” p. 4.

At present, despite over 70 uterine transplantations have been done worldwide,¹⁸ it is still an experimental procedure. The first centre that is successful in producing any live birth is the Sweden centre led by Professor Mats Brännström, at Sahlgrenska Academy. They had performed eighteen procedures (of which eight uteri were harvested using robotic-assisted approach and one from deceased donor).¹⁹ Since the harvesting part needs to be particularly meticulous, the procedure took on average 10.5-13 hours in the first nine donors (Study 1 of the team). The recipient operation took 4-6 hours. There was a case of ureteric-vaginal fistula²⁰ in these 9 donors that was diagnosed 2 weeks after the uterine harvesting and was repaired successfully after 3 months with no sequela.²¹ Even though there are centres which would prefer deceased donors to avoid collateral injury and easier vascular dissection and anastomosis with wider margin allowed, the Sweden centre has chosen to have live donors for a more thorough preparation.

The recipient needs to have thorough physical and psychological assessment before proceeding with the procedure. She needs to be fit for motherhood, understands the complexity of the series of procedures entailed and risks and complications of each of these.

18 According to the 2nd World Congress of the International Society of Uterus Transplantation in: Yu Liu et al., “Clinical applications of uterus transplantation in China: Issues to take into consideration,” *J Obstet Gynaecol Res* 46, no. 3 (2020): 366.

19 University of Gothenburg, *First Swedish transplant of uterus from deceased donor* (University of Gothenburg, 17 February 2020), <https://www.gu.se/en/news/first-swedish-transplant-of-uterus-from-deceased-donor> [accessed 19 September, 2020].

20 Dahm-Kähler, Diaz-Garcia, and Brännström, “Human uterus transplantation in focus,” p. 74.

21 Brännström, “Uterus transplantation and beyond,” p. 4.

Since in animal models, e.g. baboons, natural fertilization was not seen after uterine transplantation, supposedly due to adhesion and tubal obstruction after the surgery,²² IVF and embryo transfer is performed 6 to 12 months after uterine transplantation. As the recipient needs to receive immunosuppressants after the transplantation, the embryos are prepared beforehand and cryopreserved.²³ The baby needs to be delivered by caesarean section and there is an additional operation to remove the uterus after one or two successful pregnancies to avoid the risk of long-term immunosuppression such as infection, cutaneous and haematological malignancies, bone marrow suppression etc.

For the donor, the uterus needs to be anatomically normal, not having significant fibroids or septum.²⁴ A donor with history of prior successful pregnancy is preferred.²⁵ Besides being ABO compatible and adequately HLA matched the donor should not suffer from any infection, including *Candida* (*C. albicans*, can be isolated in the vaginal tracts of 20 to 30% of healthy asymptomatic nonpregnant women), as the recipient would be immunosuppressed. If the donor is already menopausal, oestrogen preparation of the uterus is required until menstruation is induced,²⁶ and this could increase the

22 Akar et al., "Clinical pregnancy after uterus," p. 1361.

23 Dahm-Kähler, Diaz-Garcia, and Brännström, "Human uterus transplantation in focus," p. 74.

24 Liza Johansson and Stina Järholm, "Uterus transplantation: current progress and future prospect," *International Journal of Women's Health* 8 (2016): 45.

25 Rebecca Flyckt et al., "Deceased Donor Uterine Transplantation-Innovation and Adaptation," *Obstet Gynecol* (2016): 840.

26 Dahm-Kähler, Diaz-Garcia, and Brännström, "Human uterus transplantation in focus," p. 74.

thrombotic risk of the donor.²⁷ The donor needs to have physical as well as psychological assessment as well, having no desire to have further children and able to cope with the loss of uterus, a distinct organ of one's femininity. The donor needs to understand the risks and complications of the procedures and is not coerced into consent. As uterine transplantation is a technically demanding procedure that requires a dedicated team of top professionals, having a live donor allow better scheduling and peripheral preparation and coordination.

In medical literatures, discussions on the ethical issues of this new procedure were mostly on the use of live versus death donor, also some discussions on the experimental nature of this procedure. There are, however, less discussion on the use of artificial reproduction, as well as the procreative meaning of marriage in the subject of uterine transplantation and how technology should or should not be developed.

3. Ethical Analysis

3.1 Montreal Criteria for the Ethical Feasibility of Uterine Transplantation

When the first uterine transplantation in human was done in 2000, harvesting the uterus from a live donor, there was no particular ethical considerations reported.²⁸ In the following years, there were more

²⁷ Ruth Farrell and Tommaso Falcone, "Uterine transplant: new medical and ethical considerations," *Lancet* 385 (2015): 581.

²⁸ W. Fageeh et al., "Transplantation of the human uterus," *Int J Gynaecol Obstet* 76 (2002): 247.

animal studies showing promises in uterine transplantation in ewe, rabbit and swine;²⁹ and in 2011 Ramirez and His team successfully performed uterine transplantation in sheep and reported a live birth of the animal from the transplanted uterus.³⁰

Researchers could foresee there would likely be more researches on uterine transplantation and a list of criteria "*The Montreal Criteria for the Ethical Feasibility of Uterine Transplantation*" was published in 2012 by the McGill University,³¹ Canada and presented later in the 20th World congress of the International Federation of Gynaecology and Obstetrics. An updated version was later published in *Fertility and Sterility* 2013. The criteria are set on three aspects, namely that of the recipients, the donors and the health care team. For the recipient, she needs to be a genetic female with uterine factor infertility that failed standard and conservative therapies. She needs to be fit for motherhood as well as informed consent, be responsible to follow the immunosuppressive therapy and have passed psychological evaluation. The donor needs to be a female of reproductive age, physically fit for donation and has firmly expressed no wish for future pregnancy. She is mentally capable of giving informed consent that is not subjected to any coercion. For deceased donor, there is consent for postmortem donation. The uterus should have no history of damage or disease. The transplantation should be carried out in a hospital where

29 Brännström, "Uterus transplantation and beyond," pp. 2-3.

30 Edwin Ramirez et al., "Pregnancy and outcome of uterine allotransplantation and assisted reproduction in sheep," *J Minimally Invasive Gynecol* 18 (2011): 238.

31 Ariel Lefkowitz, Marcel Edwards and Jacques Balayla, "The Montreal Criteria for the Ethical Feasibility of Uterine Transplantation," *Transplant International* 25 (2012): 444.

there is sufficient support for undertaking such a step.³² The health care team needs to provide the various information for informed consent and maintain the anonymity of the donor and recipient. There should be no conflict of interest with either party.

In the 2012 publication, the rationale of the *Montreal Criteria* were stated and the main conflicts identified by the authors were that of autonomy and non-maleficence. The principle on beneficence and justice were said to be equivocal regarding uterine transplantation.

Since AUFU is not a condition that require medical intervention to reduce morbidity or mortality, any additional surgical procedures could only give a net physical harm. Therefore uterine transplantation should not be offered according to non-maleficence. It is important that patients of AUFU are offered standard care, and that is adoption. The option of surrogacy is often mentioned at this point. However, surrogacy commercializes the womb of the surrogate mother and reduces a child into a merchandise. It is not acceptable by the Catholic Church. In the *Ethical and Religious Directives for Catholic Health care Services*, 5th ed. (Washington, DC: USCCB, 2009) by the United States Conference of Catholic Bishops, it is explicitly stated that in number 42: “because of the dignity of the child and marriage, and because of the uniqueness of the mother-child relationship, participation in contracts or arrangements for surrogate motherhood is not permitted.”

32 Francis Moore, “Ethical problems special to surgery: surgical teaching, surgical innovation, and the surgeon in managed care,” *Arch Surg* 135 (2000): 15.

Under the principle of justice, we have an obligation to provide others with whatever they are owed or deserve. The authors of the Montreal criteria argued then that patients likely to be benefited from uterine transplantation should be offered the opportunity to participate in the research. Yet it is under the assumption that if the Montreal criteria are met, uterine transplantation could bring good even as a research when information obtained could benefit future population with the problem. However, for Catholics, what is good or evil is determined by God. When a procedure is developed such that conception of life is produced outside of a conjugal act, i.e. iv-vitro fertilization, knowingly or unknowingly, it is a refusal to acknowledge God as life giver and rejecting the primary good for some other secondary good is not sensible.

The principle of autonomy obligates us to respect the autonomy of others and respect their decisions concerning their own lives. The authors of the Montreal Criteria argued, therefore, that with proper informed consent, uterine transplantation should be offered. However, for Catholics, all humans are intended family members of God the Father through His Son Jesus Christ, we cannot offer our sisters a choice that is leading them away from salvation. Moreover, one's autonomy is not absolute, as life is a gift of God and we are just stewards of it. In the *Evangelium Vitae* by Pope John Paul II, we are reminded that God shares something of Himself in giving life to man. As an act of sharing, not as an act of surrender, God does not relinquish control over the gift and man cannot do with it as he wills. If life is not regarded as God's shared gift that has a nature containing specific ends which constitute human good, then "life itself becomes a

mere ‘thing,’ which man claims as his exclusive property, completely subject to his control and manipulation.”³³ “If the promotion of the self is understood in terms of absolute autonomy, people inevitably reach the point of rejecting one another.”³⁴

Evaluating the four fundamental ethical principles with a Catholic perspective, unless the conjugal act and the conception of a human would not be separated e.g. by IVF, the clear answer would be that this technology should not be developed. However, on browsing different medical literatures, the most talked about ethical area of uterine transplantation is that of using live versus deceased donor.

3.2 Live versus Deceased Donors

Many medical literatures on uterine transplantation would touch on the ethics of using live versus deceased donors. The opinions are somewhat diverse on this issue with some teams would follow the most established model in recruiting live donors such as the Spanish and Japanese teams; whereas other teams would recruit only deceased donors such as in France, UK, Belgium and some of the US teams.³⁵

For those advocating for deceased donors, the most paramount concern would be to “first, do no harm”—the most basic principle taught throughout the world in every medical school. Uterine

33 John Paul II, *Evangelium Vitae* 22 (1995) http://www.vatican.va/content/john-paul-ii/en/encyclicals/documents/hf_jp-ii_enc_25031995_evangelium-vitae.html [Accessed Sept 29, 2020].

34 John Paul II, *Evangelium Vitae* 20.

35 Williams, “Should deceased donation be morally preferred in uterine transplantation trials,” p. 417.

transplantation is still an experimental procedure that efficacy is still in question and uterine harvesting is not a simple hysterectomy that is commonly done in every Gynaecological unit taking 2 hours or less. From the Sweden series, it took 10.5-13 hours, involving extensive dissection and harvesting of uterine artery and vein with patch of iliac vessels included.³⁶ Donors are exposed to surgical and anaesthetic risks over and above of what one normally make sense of from the more common knowledge of hysterectomy. If the donor is post-menopausal, there is the additional risk of thromboembolism because of oestrogen preparation of uterus. Donor risk is not theoretical only as there was a case of ureteric-vaginal fistula reported in the Sweden series,³⁷ also leg / buttocks pain, depression, vaginal cuff dehiscence, ureteric laceration, bladder hypotonia and climacteric symptoms from different reports.³⁸ From the data of those who had undergone hysterectomy,³⁹ besides the surgical risks of injuring surrounding structures, the risk of chronic pain after an operation, there were also reports of increase in sexual dysfunction and decrease in sexual satisfaction besides the issue on

36 Ruvalcaba Castellón et al., "The history behind successful uterine transplantation in humans," p. 129.

37 Dahm-Kähler, Diaz-Garcia, and Brännström, "Human uterus transplantation in focus," p. 74.

38 Liu et al., "Clinical applications of uterus transplantation in China: Issues to take into consideration," p. 360.

39 G. Sozeri-Varma et al., "The effect of hysterectomy and/or oophorectomy on sexual satisfaction," *Climacteric: J Int Menopause Soc* 14 (2011): 275. And J. Carter et al., "A 2-year prospective study assessing the emotional, sexual, and quality of life concerns of women undergoing radical trachelectomy versus radical hysterectomy for treatment of early-stage cervical cancer," *Gynecol Oncol* 119 (2010): 358.

gender identity.⁴⁰ Once a live donor is allowed in a program, the family and friends of patient with AUFI could suffer from the psychological pressure to offer for a complex and potentially risky procedure.⁴¹ Even after the donation, the mental health of the donor could be closely linked to that of the recipient; and in kidney transplantations, there were depression, anger, disillusionment and a sense of betrayal reported.⁴² Not only is the outcome of a recipient going to affect the psychological health of the donor, the reverse is also true especially if the donor suffers from any complications.⁴³

Besides not having the burden of donor complications, a deceased donor offers the advantage of wider dissection allowed and therefore longer vascular pedicles could be harvested including that of ovarian vessels that need to be preserved to supply the live donor's ovary. Previous reports showed that an important cause of failed uterine transplantation is uterine necrosis secondary to inadequate supply. Therefore having long vascular pedicles and the additional option of ovarian vessels for anastomosis help in the graft survival. Also more extensive supportive structures around the uterus (ligaments

40 Jean Elson, *Am I Still a Woman? Hysterectomy and Gender Identity* (Philadelphia: Temple University, 2015). And Kari Solbrække and Hilde Bondevik, "Absent organs—Present Selves: Exploring Embodiment and Gender Identity in Young Norwegian Women's Accounts of Hysterectomy," *International Journal of Qualitative Studies on Health and Well-being* 10 (2015): 26720. <https://doi.org/10.3402/qhw.v10.26720> [accessed 17 October, 2017].

41 Williams, "Should deceased donation be morally preferred in uterine transplantation trials," p. 421.

42 Imran Sajjad et al., "The dynamics of recipient-donor relationships in living kidney transplantation," *Am J Kidney Dis* 50 (2007): 834.

43 Johannesson and Järholm, "Uterus transplantation: current progress and future prospect," p. 49.

and bladder tissue) could be included to anchor the graft to its proper position.

As there were more uterine transplantation done involving living donors,⁴⁴ there must be obvious advantage of this choice. The main one being its proven efficacy as well as the better preparation allowed. For the initial years of uterine transplantation, all live birth came from live donors until the first live birth from deceased donor in December 2017 in Brazil.⁴⁵ While the second uterine transplantation in Turkey using uterus from deceased donor had shown signs of early pregnancy, these resulted only in very early miscarriages.⁴⁶ Some reasons that could contribute to the failure were vasoactive drug used to maintain the brain-dead patient and elevated inflammatory mediators in donor plasma.⁴⁷ The duration of cold ischemia as well as the type of preservatives used to store the graft may be other factors that are more modifiable. However, with no successful pregnancy even in larger experimental animals transplanted with cadaveric uterus, one definitely needs to question whether the technique is in a stage mature enough to be directly tried on humans.

With better schedule allowed using live donor, the transplantation and harvesting are usually performed in adjacent operating theatres.

44 Liu et al., "Clinical applications of uterus transplantation in China: Issues to take into consideration," p. 360.

45 Simona Zaami et al., "Advancements in uterus transplant: new scenarios and future implications," *European Review for Medical and Pharmacological Sciences* 23 (2019): 894.

46 Akar et al., "Clinical pregnancy after uterus," p. 1361.

47 Johann Pratschke et al., "Brain death and its influence on donor organ quality and outcome after transplantation," *Transplantation* (1999): 343.

There is minimal cold ischemic time and graft survival is additionally optimized by having better screening of donor. More comprehensive screening of medical history, gynaecological conditions as well as any occult infection could be allowed for live donor to ensure suitability. If the live donor is related to the recipient, the better haplotype match may offer immunological advantage of less rejection and chance of longer graft survival even though the uterus is not meant to stay long with the recipient. At the present scale of operation, live donors seem easier to find than deceased donors,⁴⁸ especially because most people would not have signed up for a uterus donation upon death given that it is still such a new innovation. While new research showed that the uterus could tolerate cold ischemia with proper preservative perfusion for 24 hours,⁴⁹ it is still very rush to screen for uterus suitability and contraindication as well as assembling a team of top expertise for the procedure. A very well-thought-of plan and protocol need to be in place to smooth out all the logistic issues in centres recruiting deceased donors. However, with at least 5 live birth out of the 25 babies born of transplanted uterus from deceased donors now,⁵⁰ there are more arguments on whether harm to a live donor a necessary evil, and even the Sweden centre with the best record on uterine transplantation using live donors starts investigations on deceased donors.

48 Williams, "Should deceased donation be morally preferred in uterine transplantation trials," p. 421.

49 Krishen Sieunarine et al., "Cold ischaemic preservation of human uterine tissue," *Int Surg* 93, no. 6 (2008): 366.

50 Counted to End of August 2020. One live birth from deceased donor uterine transplantation in Brazil, 2 from Cleveland Clinic (US), 1 from Penn Medicine (US) and 1 from Czech.

3.3 Life-Enhancing versus Life-Saving Transplantation— Risks Justified?

From the original totality principle, as long as one part of the body is damaged, the whole is damaged. Nonetheless, it is still acceptable to donate one's organ to save someone else's life given that it is done out of love and not any personal gains and the harm to one's body is minimal. However, if the harm is significant, then the donation cannot be justified as everyone has a responsibility to take good care of one's body.

Looking at kidney donation or liver donation, these donors are also subjected to significant harm of the procedure as well as higher likelihood of future renal or liver failure, having less reserve to buffer. However, patients requiring liver transplant are at the verge of imminent death, and liver transplantation is the only hope to life. Using utilitarian approach, one may still say that the harm done to the live donor could be justified with the health gain of the recipient in a liver transplant centre with good track record. For kidney transplant, even though the patients would not suffer imminent death, they need to keep their lives by frequent to continuous dialysis that significantly impact their lives. The dialysis itself also has its complications and depending on other diseases a patient has, the life expectancy is averaged to be 10 years on dialysis. Therefore, kidney transplantation could be classified as life- saving as well. Donors of these transplantations are thus helping to restore life and freedom of the suffering patients and could be justified if an experienced healthcare team could keep the risks to the donors to a minimum.

While hysterectomy is a very common procedure done for both benign and malignant condition, the harvesting of uterus is more complicated than the usual hysterectomy. When a lady undergoes hysterectomy for a clinical reason, the risk of the procedure can be balanced by the health gain. However, uterus donation incurred a let harm to a live donor, the only gain they have is the satisfaction that they have helped someone. And in fact from information provided by the Sweden team, they received numerous offers from women who would be willing to become altruistic living donor for women with AUI.⁵¹ Yet such enthusiastic altruism reflects a belief that the uterus is expendable, not part of a whole, and an unawareness that in assisting a separation between the procreation and the conjugal act of marriage, these donors dwarf the dignity of the baby to come. Vatican II's *Pastoral Constitution, on the Church in the Modern World* asserted:

Though made of body and soul, man is one. Through his bodily composition he gathers to himself the elements of the material world; thus they reach their crown through him, and through him raise their voice in free praise of the Creator. For this reason man is not allowed to despise his bodily life, rather he is obliged to regard his body as good and honourable since God has created it and will raise it up on the last day.⁵²

51 Williams, "Should deceased donation be morally preferred in uterine transplantation trials," p. 421.

52 *Gadium et Spes* 14 (1965) http://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_const_19651207_gadium-et-spes_en.html [Accessed Sept 29, 2020].

We all have to cherish our bodies and not mutilate a healthy functioning body part, direct sterilization is therefore not allowed. From the Catholic perspective, a person should not willingly be a uterus donor and therefore render herself infertile, denying God as life-giver and hurting herself in the process.

Uterine transplantation is classified as a life-enhancing procedure, aiming to improve the quality of life of the patient; specifically, to fulfil the wish of patients with AUI to be gestational mother. However, ladies requesting the transplantation would not have their physical health enhanced with the procedure, in fact, quite the reverse. Besides the immediate anaesthetic and surgical complications (vascular, bowel and urinary tract injury), they could be subjected to delayed complications such as chronic pain, adhesion and intestine obstruction etc. later in life. With prior operations, there would be more adhesion making subsequent operation more challenging and prone to complications easier.

For a woman undergoing uterine transplantation, if the procedure is not successful, they still need at least 2 major abdominal operations, the transplantation as well as the explantation of the uterus, and additional surgery and intervention if there are any complications. All the physical and psychological stress and trauma would be for nothing more than some gain in knowledge in reproductive medicine. Even for those who are successful, they need to expose themselves as well as their foetus to the risk of immunosuppressants and it is impossible to have vaginal delivery. Caesarean section entails additional surgical risks and more blood loss, requires a longer postpartum recovery and

risk of thromboembolism and carries a 6-11% risk of chronic pain.⁵³

In addition to subjecting themselves to physical hazards, recipients have to face the psychological stress secondary to the uncertain outcome and the relationship with her husband / partner and donor. In the Sweden series, recipients who did not receive the uterus from their mother felt guilt and an increased sense of responsibility to the donor.⁵⁴ From the Sweden data, patients were physically and psychologically worse when interviewed at 3 months after the transplantation though they returned to normal when interviewed at 6 months.⁵⁵

In fact, patients with AUI can choose to adopt and be a mother in social sense still instead of putting themselves under lots of psychological stress and weakening their bodies significantly, enduring 3-4 major abdominal surgery and the aftermath of them. Even disregarding the Catholic Church's teachings, there are questions as to how the desire to experience gestation is enough to justify a uterine transplantation!

3.4 Experiment and Zeal over It

Before introducing a new medical intervention, proper steps

53 Stephanie Weibel et al., "Incidence and severity of chronic pain after caesarean section: A systematic review with meta-analysis," *Eur J Anaesthesiol* (2016): 853.

54 Stina Järholm, Liza Johannesson and Mats Brännström, "Psychological aspects in pre-transplantation assessments of patients prior to entering the first uterus transplantation trial," *Acta Obstet Gynecol Scand* 94 (2015): 1037.

55 Johannesson and Järholm, "Uterus transplantation: current progress and future prospect," p. 49.

should be followed to first ensure there is adequate scientific basis, then to establish the prerequisite, efficacy and likely complications in animal models before proposing it to be done in humans. Even with all these, the first cases need to be done under proper clinical trial setting and under the scrutiny of a formal ethic committee.

For the first two cases of uterine transplantation in Saudi Arabia and Turkey, none of these steps could be found. And even though the Sweden team had a series of animal research before proceeding to research on humans, researches on allogenic uterine transplantation had not been successful in producing any livebirth in non-human primate, the closest to human genetically. Although live births could be shown in rats and mice, there were none from allogenic transplantation on pigs or rabbits.⁵⁶ After the 2011 report of one live birth of sheep from 12 allogenic uterine transplantations in Ramirez's study,⁵⁷ the Sweden research on humans started in 2012.

The first human livebirth from the Sweden trial in 2014 spurred the zeal on this procedure all over the world. When a graft uterus had been submitted to 24 hour of cold ischemia, pregnancy after uterine transplantation was only shown in a mouse model using a syngeneic donor where there was no need of immunosuppression. There were no trials on bigger animals to show that pregnancy could actually materialize from deceased donors, especially with the effect of immunosuppressant. Despite having only theoretical feasibility, those

56 Ruvalcaba Castellón et al., "The history behind successful uterine transplantation in humans," p. 127.

57 Ramirez et al., "Pregnancy and outcome of uterine allotransplantation and assisted reproduction in sheep," p. 238.

healthcare team who would like to spare the risks to the live donors have already started their trials using uterus from deceased donor.

The zeal to be first and successful in an innovative treatment could simply lead many healthcare teams to be less cautious than expected. In organ harvesting from a multiple organ deceased donor, the uterus is expected to be harvested last. Organs such as liver and kidneys are proven to be life-saving already, so priority should be given to them rather than an experimental procedure. In addition, the microbiome of the vagina could contaminate the other organs if the uterus is harvested first.⁵⁸ However, it could be noticed that in the Turkey case, the uterus was the first organ to be harvested. The lapse of the healthcare team was again shown when the Galaxy Care Hospital in Pune announced that they had performed the first uterine transplantation in India in May 2017, where the mother donated her uterus to her daughter with MRKH syndrome. Soon after the announcement, it was found that the hospital did not have any ethics approval for performing it and it was not done properly as an experimental procedure in a clinical trial.⁵⁹ Such disregard of medical ethics in the part of the medical professionals could be devastating where patients became guinea pigs in the hospital's pursuit of fame in the name of science.

How prevalent is the issue of uterine transplantation being done outside of clinical trial is not known. The number of the procedures

58 Flyckt et al., "Deceased Donor Uterine Transplantation-Innovation and Adaptation," p. 840.

59 HuffPost staff, *Apex Medical Body Questions India's First Uterus Transplant, Says Pune Hospital Didn't Take Permission* (Huffington Post, 29 May 2017), http://www.huffingtonpost.in/2017/05/29/icmr-questions-indias-first-uterus-transplant-says-pune-hospit_a_22114296/ [Accessed Oct 17, 2017].

being performed worldwide in 2017 was estimated to be around 25 from published data,⁶⁰ but was increased to 38 when a registry was later set up in September 2017.⁶¹ Unsuccessful cases would be less likely submitted and published, even though lessons could still be learned from these cases. Also, missing the unsuccessful cases would give a falsely high successful rate of the transplantation. Professor Brännström started a registry in September 2017 when the year-old International society for Uterus Transplantation held its first Congress, aiming to collect a more comprehensive data on the procedure, as well as to record the long-term outcome of the donors, recipients and children from the uterine transplantation. As an experimental procedure, it is of paramount importance that the uterine transplantation be done under proper informed consent of the recipient, who should understand all the risks and benefits of different options. However, it was questioned⁶² whether there could ever be a proper informed consent at the current stage with such incomplete pictures, e.g. the information that 25% of graft uterus was explanted was only informally known.⁶³ Three of the eight Sweden births were born prematurely due to preeclampsia, probably related to the maternal MRKH syndrome. The team developing the Montreal Criteria said that the recipients must understand the harm they may incur and had low expectations with regard to the chances of carrying and giving birth to a healthy baby. However, these recipients

60 Ruvalcaba Castellón et al., “The history behind successful uterine transplantation in humans,” p. 126.

61 Telegraph, *The womb transplant confirms its promises* (Telegraph, 4 Oct 2017).

62 Williams, “Should deceased donation be morally preferred in uterine transplantation trials,” p. 422.

63 Telegraph, *The womb transplant confirms its promises* (Telegraph, 4 Oct 2017).

cannot be expected to be completely rational in making a decision to participate in an experiment, the decision is intrinsically emotional and socially implicated. From the first uterine transplantation in US,⁶⁴ it could be seen that despite proper informed consent, the recipient could hardly accept a failed procedure. This is certainly not helped with the rosy picture painted by researchers with speech such as “Although we may be accused of bias, we believe that this procedure will become an established treatment option, as an alternative to adoption or surrogacy, in a relatively small group of suitable women with AUFU.”⁶⁵

With so many preparations and procedures involved, uterine transplantation is an expensive operation. As a life choice, one would not expect it to be paid by public money nor funded by normal health insurance if it becomes a normal treatment option. Patients with AUFU are therefore under the pressure to opt for the experiment before it becomes unaffordable, a fact that is particularly true in poor countries. Even when no coercion is given by the researchers, it is found that these potential recipients are psychologically distancing themselves from the risks explained,⁶⁶ therefore it could hardly be possible to obtain an informed consent in its true sense.⁶⁷

64 Flyckt et al., “Deceased Donor Uterine Transplantation-Innovation and Adaptation,” p. 841.

65 Jones et al., “Uterine transplantation: past, present and future,” p. 1437.

66 Srdjan Saso et al., “Psychological Issues Associated With Absolute Uterine Factor Infertility and Attitudes of Patients Toward Uterine Transplantation,” *Prog Transplant* 26 (2016): 32.

67 Williams, “Should deceased donation be morally preferred in uterine transplantation trials,” p. 423.

Even in affluent countries, the health expenditure is still limited, priority needs to be set so as not to diverge the fund from more helpful remedies. With the huge expenses required for these experiments, yet physical harm is inflicted on previously well-functioning ladies in the hope of bearing babies whose health might be affected by the immunosuppressant and maternal condition, questions had been asked as to whether research fund should be spent on other life-threatening conditions instead.⁶⁸

3.5 Hope Offered or Temptation Induced?

Currently, most uterine transplantations were done in patients with MRKH syndrome. In the past, surgery offered to them is mainly the creation of a neovagina to partially restore sexual function. Their aspiration to be mother could only be that of spiritual mother or social mother through adoption. With development of surrogacy, this group of patient is known to have difficult oocyte retrieval.⁶⁹ Now with the development of uterine transplantation, it was noticed that in additional to the procedural risks that are discussed earlier, they had high risk carrying a pregnancy as well. To ensure that there were adequate embryos, the Sweden trial had cryopreserved at least 10 embryos before uterine transplantation for each recipient.⁷⁰ The UK team also specified at least 10 embryos required for one to be eligible to be recipient, and still there was the discussion whether

68 *Ibid.*, p. 416.

69 Mark Damario, "Transabdominal-transperitoneal ultrasound-guided oocyte retrieval in a patient with Mullerian agenesis," *Fertil Steril* 78, no. 1 (2002): 189.

70 Dahm-Kähler, Diaz-Garcia, and Brännström, "Human uterus transplantation in focus," p. 74.

donor embryo should be used if the recipient had insufficient embryos for the procedure.⁷¹ From the Sweden study 1 data, 2 out of the 9 uteri were explanted and nine births were bore by the remaining 7 patients. Among these 7, 6 suffered from MRKH. Three of them had preeclampsia, probably related to their single kidney status.⁷² The first baby therefore was delivered before 32 weeks. Two of the MRKH patients had cholestasis, one of them also had preeclampsia at the same time. While pregnant ladies having cholestasis during pregnancy have good prognosis, the condition is associated with increase foetal morbidity and mortality.⁷³

While time cannot be turned back, looking at the overall risks patients with MRKH syndrome subject themselves and their babies to after the development of the reproductive medicine, one can reasonably question whether these are in fact distracting them from living contently as they are. Many patients suffering from congenital diseases have difficulty functioning well independently, which is not the case in this group of patients. Without the temptation of these reproductive procedures, they may find it easier to appreciate their uniqueness and find alternative ways to live out their motherhood. Life is God's gift, instead of being self-conscious of the gift that she has no hope of receiving as other married women, she can be more aware that she is herself a gift and live a life making a gift

71 Farrell and Falcone, "Uterine transplant: new medical and ethical considerations," p. 582.

72 Ruvalcaba Castellón et al., "The history behind successful uterine transplantation in humans," p. 132.

73 L. K. Tan, "Obstetric cholestasis: current opinions and management," *Ann Acad Med Singapore* 32 (2003): 294.

of herself to her family and community, in services and in nurturing of others' growth. As Jesus Christ has shown us, our humanity is a journey towards God the Father, moving from the image of God to the likeness of God, moving away from the "for me" to the "for others." Both uterine transplantation and surrogacy are blurring the magnificence of humanity. They put a baby under the realm of its mother's wish, crushing the life of those who are already destined to be human in those "surplus" embryos. These procedures deny that life is a gift of God, in each man is His image with his uniqueness and purpose; life is good despite some imperfection from human's perspective. These procedures prompt the patients to focus on their imperfection and promote a self-centred "I want and I do" mentality. A person is not taken as a whole but viewed in her functionality, and therefore the uterus is given away by one who has no more wish of children and adopted by another to serve a term of one or two babies before explanting. Taking part in the transplantation, the patient is tarnishing the dignity of human being unknowingly.

Public in general would empathize with the unfortunate ladies born without a uterus. While patients with MRKH syndrome are often quoted in the development of uterine transplantation, in a US study, they account only for one-third of those seeking this intervention.⁷⁴ The institute followed-up 239 of 250 persons that contacted them for the procedure, of which 32 % had congenital AUF1, 17% had at least one biologic child, 7% were single (not in a relationship), 5 male-to-female transgender and one intersex individual.

⁷⁴ Sara Arian et al., "Characterizing women with interest in uterine transplant clinical trials in the United States: who seeks information on this experimental treatment?" *American Journal of Obstetrics & Gynecology* 216, no. 2 (2017): 191.

When one has an acquired AUI, it is mostly because of a hysterectomy for various benign or malignant conditions. As a part of life, we learn to rise up from the consequences of our circumstances. Therefore accepting the post-hysterectomy state and live the best of it would be more conducive to personal growth. “*Take up your cross and follow Me,*” (Mt 16:24) it is more in keeping with the Christian teaching to live as we are than to seek the uterine transplantation, a procedure associated with so many risks. Even though some would say the procedure is hope offered to this unfortunate group, but in fact it is a procedure rejecting God as Creator and life giver, it is actually a temptation in disguise. When it was shown that 17% of the 239 persons had a biologic child already and still seeking a transplantation, an intervention on the body is sought to treat more the psychological desire of the patient.

The US profile of people seeking uterine transplantation showed 7% of them not in a relationship and 5 transgender and 1 intersex. In the protocol of the particular US institute, they allowed sperm donation for those women without a partner or same-sex relationship women. Parenthood is a calling, in which a child is given by God as gift. For the healthy and holistic growth of a child, he or she needs to have the safe home of both a mother and father who have committed themselves to each other for their whole lives and are themselves loving each other complementarily. Seeking a transplantation and parenthood despite not in a relationship put a child in the category of a “thing” not a person nor a gift, and the institute allowing such circumstance to occur of course has a similar mentality.

While some would say that uterine transplantation could be done for those not actually contemplating pregnancy, it would mean lifetime immunosuppressive therapy and the associated risks of infection and malignancy. There could be a transgender person who wants a uterus to better identify oneself as female, or a woman with hysterectomy who wants to have a uterus for gender identity. While those genetic male was rejected at the US institute for the time being, there was already discussion in Brazil on the possibility of uterine transplantation to genetic male.⁷⁵ Brazil reported the first uterine transplantation done in September 2016 using graft from a deceased donor. Since reproductive rights are recognized as universal rights by the Brazilian legislation, including the lesbian, gay, bisexual, transsexual and transgender population, discussion was more on the challenge to overcome technical difficulties instead of the ethics of doing it!

There is a paradox when the uterus is very expendable with altruistic donors seem to be more available than cadaveric donors from the Sweden reports, and at the same time the very core of it in one's gender identity. God has His plan in every one of us in creating us as either male or female, it is written in our chromosomes. While there could be people with congenital disorders and ambiguous sexual characteristics, the great majority of people with gender confusion has no chromosomal disease nor diseases of the metabolism of sex hormones. Without root, a plant cannot grow. Denying one's root, a person cannot grow too. Living contradictory to what is so deeply

75 Theo Lerner et al., "What are the Possibilities of Uterine Transplantation in Transgender Patients?" *Rev Bras Ginecol Obstet* 39, no. 10 (2017): 521-522.

ingrained in every cell of us as to who we are bring suffering that cannot be healed by physical means, though the presence of which, uterine transplantation in this case, is tempting enough.

The first attempt of uterine transplantation in literature was reported in Germany in 1931, when the transgender woman Lili Elbe died 3 months later due to surgical complications. In the name of offering hope, the researchers are unlikely to realize they are offering only temptation. Disrupting the order set by God in so fundamental an area as female and male is going to bring disaster to humanity and especially escalated suffering to our future generations. Not being halted by the society, the temptation to surpass one's peer simply would see the operation being done in the genetic male, just because they can do it.

3.6 Inseparability of Marriage Act and Procreation and Dignity of a Person

Marriage is not a piece of contract for Catholics but a covenant between a man and a woman who have voluntarily vowed to love and be supportive of each other for the rest of their lives, besides receiving life as gift from God. It has always been the Church's teaching that the two meanings, unitive and procreative meanings, of the conjugal act in marriage cannot be separated (CCC 2363). Conjugal act is the physical expression of the total self-giving of a woman and a man, and such totality of self-giving to each other is only possible in the exclusive and lifelong commitment and union in marriage. The procreative aspect of marriage is the unitive result of the fertility of the spouses. "God blessed them, and God said to them, 'Be fruitful

and multiply, and fill the earth and subdue it' ” (Gen 1:28). God calls married couples to share in His love and power as Creator and Father through their cooperation in transmitting the gift of human life.⁷⁶ Children are the fruits and crowns of a marriage and a gift from God. As such, children are not a matter-of-course of marriage, but should be respected and treasured as valued gifts given to the care of their parents.

For infertile couples, they are particularly called to “other important services to the life of the human person, for example, adoption, various forms of educational work, and assistance to other families and to poor or handicapped children.”⁷⁷ However, many reproductive procedures are pursuing life in ways that disregard the order set by God, separating the unitive and procreative meanings of conjugal act in marriage and in effect trampling the dignity of human beings.

In uterine transplantation nowadays, embryos are produced through in-vitro fertilization and cryopreserved until 6 months to one year after the transplantation before introduced into the grafted uterus. Catholics recognize that life begins from conception. Once fertilized, a human embryo is destined to be a human, not any other species nor be reduced to an “it” where “its” value depends only on whether “it” serves our purposes. However, the requirement of having at least 10 embryos prepared beforehand convey the message that either human

76 John Paul II, *Familiaris Consortio* 28 (1981) http://w2.vatican.va/content/john-paul-ii/en/apost_exhortations/documents/hf_jp-ii_exh_19811122_familiaris-consortio.html [Accessed Oct 17, 2017].

77 John Paul II, *Familiaris Consortio* 14.

embryos are not regarded as humans or that even if they are regarded as humans, they deserve a place in the world only if they serve a certain purpose of another, or else they could simply be sacrificed.

Not only humans in the form of embryos are not being respected, the technology of in-vitro fertilization also dwarfs the dignity of children by reducing them into products of technology. Subjecting humans to such reproductive technology is analogous to the breeding of horses or endangered animals, it devalues human beings. The dignity of a person rests in his / her being an image of God. Life is a gift from God, disregarding this basic fact introduces disorders into relationship between human beings as well as our relationship with God and the world. In-vitro fertilization subordinates a child under the desire of his / her parents. A child has a place in the world only because his/her parents want a child at that moment of their lives. Therefore foetal exposure to even FDA class D immunosuppressant (i.e. drugs with positive evidence of risk to the foetus) is now justified. However, if a child is subjected to the whims and wishes of his/her parents, he or she could be disposed of by an abortion or abandonment if and when regarded as being inconvenient!

The message of this reproductive technology to the community is that human life is not that valuable and is subjected to other human beings in power. The very basis of equal human rights rests in respecting God as life-giver and each of us is the image of God. Therefore, no human being is subordinate to their fellow human being. If God is taken out of the picture, then the conviction that

“all human beings are born free and equal in dignity and rights”⁷⁸ becomes simply a nice idea that one could bend to mean those not yet born have no rights nor dignity, or bend to apply only when one finds it convenient. “When the sense of God is lost, the sense of man is also threatened and poisoned.”⁷⁹

4. Conclusion

Against the secular culture of death where contraception, abortion, euthanasia are rampant and promoted as individual freedom and autonomy, the Catholic Church is advocating a culture of life. God is continuing His creation process by granting new life to the conjugal union of married couples. Human beings have a transcendent component and are unique in our being called to a communion with God the Father. As our destiny does not rest in this life on earth, it is important always to recognize the laws of good and evil as laid down by God Himself in our journey home. Grasping life using our own means could be counterintuitive. “Research aimed at reducing human sterility is to be encouraged, on condition that it is placed ‘at the service of the human person, of his inalienable rights, and his true and integral good according to the design and will of God.’” (CCC 2375) While technology such as uterine transplantation seems to offer hope to couples suffering from AUI, at the current stage, it necessitates the use of IVF and thus the separation of the unitive

78 United Nations, *Universal Declaration of Human Rights*, Article 1 (1984) <https://www.un.org/en/universal-declaration-human-rights/#:~:text=Article%201.,in%20a%20spirit%20of%20brotherhood> [accessed 29th Sept 2020] .

79 John Paul II, *Evangelium Vitae* 22.

and procreative meaning of the marriage act, subjecting the child as product of technology and at the same time suffocating the growth of the persons in the embryos that are “spared.” Maintaining the union between procreation and marriage act safeguard the dignity of human and acknowledging God as our Creator, He alone knows best.

Would uterine transplantation be somehow acceptable by the Catholic Church in future? In-vitro fertilization is used since in animal studies, natural pregnancy could not be achieved in experimental animal models (e.g. baboon), purportedly due to severe adhesion and tubal obstruction. If new surgical techniques could be developed such that tubal patency could be maintained and adhesion could be minimized or surgically lysed, then there is an opportunity for natural fertilization. Low tubal ovum transfer (LTOT) put an ovum or a few ova in the mid to low portion of the fallopian tube, the purported obstacles to natural fertilization is therefore bypassed. In the age where the main aim is to increase efficiency and effectiveness, the LTOT technique is not popular. However, the technique could maintain the unitive and procreative meanings of a conjugal act and maintain an openness to the plan of God as to whether it is truly good for a new life to come to the particular family, knowing the particular high risk of pregnancy in MRKH ladies.

For the uterus, if it is donated by a pre-menopausal woman, the procedure would render the lady sterile in addition to the surgical risks involved and is not considered acceptable by the Catholic Church according to the principle of totality. However, if it is donated by a post-menopausal woman, the use of hormonal therapy

to “awaken” the uterus could increase the thromboembolic risk to the donor. As uterine transplantation is only a life-enhancing procedure, and even a successful transplantation carries in the package a few major abdominal procedures and the associated risks and long-term effects of these injuries to an originally healthy body, even the risks to the recipient is questionably justifiable, let alone that of a live donor. Moreover, a post-menopausal uterus should still not be regarded to have served its function and could be disposed of. Body and soul are not segregated parts but in totality constitute our personhood. Every one of us is entrusted with the care of our body, and we have to take good care of it and respect every part of it as an integral component of the whole.

While the use of uterus from deceased donor is more morally acceptable, consideration still need to be paid to harvest organs for life-saving procedures first. Even though immunosuppressants that are most harmful are avoided during pregnancy of the uterine transplanted ladies, the long-term effect to the baby exposed to these medications are not clearly known.⁸⁰ The rights of the foetus to be protected from harm has hardly any weight in the consideration of development of uterine transplantation. *Evangelium vitae* has warned of “a certain Promethean attitude which leads people to think they can control life and death,”⁸¹ and researchers could become less cautious than they should in their pursuit of fame and “success.”

80 Sahlengrenska Academy, *Ethics - Uterus Transplantation* (Sahlengrenska Academy, 23 Oct 2014), <https://sahlgrenska.gu.se/english/research/uterus/ethics> [Accessed Oct 17, 2017].

81 John Paul II, *Evangelium Vitae* 15.

Another development in reproductive medicine that may help ladies with AUFI is bioengineered uterus. The concept is to prepare a uterine scaffold and allow the somatic stem cells of the recipients to populate the scaffold and develop into the required cell types.⁸² Although the research is still preliminary currently, if successful, this technique negates the need of immunosuppressant use and its effect on the foetus as well as the recipient. There would be no need to explant the bioengineered uterus, and it avoids the misconception the community may perceive that human and his/her organs and tissues are something that could be made use of.

While children from marriage has long been regarded as blessings from God, not having any children in marriage does not equate to God's wrath on us. As God loves every one of us and has prepared the best for every of us, living a life according to His commands and laws and we could discover His plan that may in fact direct the infertile couples to services in other areas. While taking care of our bodies include getting remedies for disorders or diseases, the effort need to be proportionate and the harms and goods of a remedy need to be weighed. As married couples are only cooperating with the love of God the Creator in their mission to transmit human life (CCC 2367), let us not forget to follow the Creator's lead and not pretend to be creator ourselves.

82 Brännström, "Uterus transplantation and beyond," p. 5.