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Case Report

The First Italian Uterus Transplantation and the Desire for Motherhood Beyond Biological Boundaries: A Case Report

Maria Luisa Pistorio ^{1*}, Concetta De Pasquale ¹, Massimiliano Veroux ², Alessia Giaquinta ¹, Martina Maria Giambra ¹, Antonino Grasso ¹, Paolo Scollo ³ and Pierfrancesco Veroux ¹

¹ Vascular Surgery and Organ Transplant Unit, Department of General Surgery and Medical-Surgical Specialties, University Hospital of Catania, Catania, Italy;

² Organ Transplant Unit, Department of Surgical and Medical Sciences and Advanced Technologies, University Hospital of Catania, Catania, Italy;

³ Maternal and Child Department, Obstetrics and Gynecology, Cannizzaro Hospital, Catania, Italy;

* Correspondence: marialuisa.pistorio@unict.it, Telephone +390953782629. Fax +390953782629

Abstract: Background: Uterus transplantation represents a revolutionary breakthrough for women with absolute infertility of uterine origin, offering them the possibility of realizing the dream of motherhood. This complex procedure has profound medical, ethical and psychological implications. The aim of our study was to analyze the psychological distress caused by infertility and the experience of trying to get pregnant through uterus transplantation in a 29-year-old woman. Methods: The case report follows the Case Reporting (CARE) guidelines. In the pre-transplant evaluation, Giorgia was administered the Machover Test, the Bauman Test, the Million Clinical Multiaxial Inventory- III (MCMI-III), the Short Form Health Survey-36 (F-36), the Patient Health Questionnaire-9 (PHQ-9), and the General Anxiety Disorder-7 (GAD-7). The same instruments were re-administered 1 year and 2 years after the transplant and the birth of the baby girl. Results: The projective graphic tests highlighted some significant aspects: the facial expression of the female figure became more restless in subsequent evaluations, until aggressiveness emerged (clenched fists) in the last evaluation. The tree will also be drawn on a flowerbed in the last evaluations, indicating a sense of loneliness and abandonment. Conclusions: Overall, uterus transplantation appears to be psychologically well-tolerated, but ongoing evaluation and psychological support are essential.

Keywords: uterus transplantation; clinical psychology; infertility; mental health.

1. Introduction

Infertility, defined as the failure to conceive after one year of regular unprotected sexual intercourse [1], often causes significant social distress and is accompanied by numerous psychological and social problems such as depression, anxiety, social isolation, and sexual dysfunction [2]. The feeling of not being able to fulfill the biological and social desire to have children can lead to a decrease in self-esteem and sense of self-worth. Women who suffer from infertility may feel isolated or stigmatized, especially in cultures where motherhood is highly valued. It is considered a major life crisis and has a strong impact on the quality of life of individuals who experience it [3, 4, 5]. Uterus transplantation represents a revolutionary breakthrough for women with absolute infertility of uterine origin (UAIF), offering them the possibility of realizing the dream of motherhood. This complex procedure has profound medical, ethical and psychological implications, which can significantly affect the lives of patients. Various studies highlight the importance of psychosocial evaluation in this area, emphasizing the need for evaluations that consider fertility, donor, and partner factors.

In the prospective observational study by Järholm et al. [7], the psychosocial outcomes of nine women with AUFI and their partners were assessed two and three years after uterus transplantation.

The assessment focused on fertility-related quality of life, mood, and couple relationships. The results showed that transplant failure and failure to achieve parenthood result in psychological strain on couples, which is why psychological support is crucial for recipients and their partners [7]. In the study by Wall et al. [8], the psychological impact of infertility was assessed on 21 uterus transplant recipients. Six were pregnant, six had experienced failure and removal of the transplanted uterus, five had given birth to a healthy child and four were awaiting embryo transfer. It emerged that the diagnosis of AUI had a strong negative impact on psychological well-being, relationships and female identity, and that, on the other hand, the positive impact of uterus transplantation on the healing of the “emotional scars” of AUI, on female identity and reproductive autonomy was strong [8]. Motherhood after uterus transplantation reflects a love of life, solidarity and the ability to go beyond one's fears and anxieties, which undoubtedly shows how strong the couple's desire for parenthood can be, overcoming all the difficulties (uterus transplant, immunosuppressive therapy to prevent organ rejection, homologous assisted fertilization, etc.) that certainly arise throughout the process necessary to give birth to the much-desired child. A review of the literature published in 2021 showed a cumulative rate of live births in successful transplant procedures of over 80% in 62 published cases [9]. In the study by Järholm et al. [10], we sought to understand how women cope with the first years of motherhood after uterus transplantation. The study included seven participants (of which 6 had AUI due to congenital absence of the uterus, while 1 had undergone a hysterectomy) who had successfully undergone uterus transplantation and who were given structured interviews once a year for 5 years after transplantation. All 7 participants became pregnant during the study period and became mothers, and it was noted that these women, who seek motherhood after uterus transplantation, generally describe their situation as manageable and comparable to other women who undergo infertility treatments. However, real psychological strains in motherhood after uterus transplantation emerge such as concerns about the health of the child and the effects of immunosuppressants [10]. The aim of our study was to analyze the psychological distress caused by infertility and the experience of trying to get pregnant through uterus transplantation in a 29-year-old woman affected by Rokitansky syndrome (MRKH), a rare congenital disorder characterized by the absence or incomplete development of the uterus and upper vagina. Better understanding the desire for motherhood in women undergoing uterus transplantation will allow us to plan targeted support for this group of patients.

Case history

Giorgia is a 29-year-old woman with MRKH Syndrome, a rare congenital disorder characterized by the absence or incomplete development of the uterus and upper vagina, diagnosed at age 17. The patient provided written informed consent and permission to use her data before participating in the study. The Italian Research Project for Uterus Transplantation from a brain-dead donor was approved in 2018 (No. 1438/CNT2018). The project was approved by the Ethics Committee Catania 1 (protocol No. 0026684 on July 3, 2017). In April 2019, Giorgia underwent psychological interviews and a psychodiagnostic evaluation required for inclusion on the waiting list for a uterus transplant. Giorgia has a low level of education (middle school), is a housewife and is married. During the first interviews she appears well-groomed and has a collaborative attitude. She is well-oriented and has a fluent and coherent language. There are no disturbances in the form and content of thought. As regards affective-emotional modulation, her mood appears to tend towards deflection. She reports that her social relationships are good and also the relationship with her husband. As regards family relationships, they are also serene and supportive. Her perception of health is “excellent”, and she considers it “more or less the same” compared to the previous year. There are no psychiatric disorders according to the DSM 5 [11]. During the clinical psychological interview, Giorgia calmly describes her pathology, which was diagnosed at the age of 17: “At around 15-16 years old, my menstrual cycle hadn't arrived yet, both my mother and my sister had started at 11 years old; therefore, we suspected that something wasn't right. So, I had some checks, but everyone told me that everything was fine, and I had to stay calm, that my period would come. Then my mother told me that my grandmother had started at 19 years old, so I could be like her”. At the age of 17, Giorgia underwent further medical checks and was diagnosed

with MRKH Syndrome. Regarding her relationship with her husband, Giorgia says she got married at the age of 21 and that her husband was her salvation: *"My husband arrived in the abyss of my life. When we met, I immediately told him about my syndrome, I said to myself, so that he might run away right away, like my ex-boyfriend did. Instead, he stayed, and we have been together for 12 years. He was not afraid of my syndrome; he always told me: <<I love you just the way you are... Despite his closeness, I spent the nights crying, especially when I found out that some friend or cousin had gotten pregnant: it had become a fixed obsession in my mind"*. Upon hearing the news of a possible uterus transplant, a procedure still experimental in the United States, Giorgia begins to contact the Transplant Centers in the United States, but the path is not so simple. Despite this, she states that she does not exclude other possibilities (adoption, surrogate motherhood) which she fully approves. After a few years, the news of the experimental protocol in Italy arrives, Giorgia is happy and begins the path to be included in the waiting list. During a psychological interview, Giorgia, when asked *"Why is a uterus transplant so important to you? What motivated you to make such a strong choice, which still puts your body at risk?"*, replies: *"Maybe, it's not so much the desire to have my own biological child, because, in my opinion, it doesn't change that much, it's the experience of pregnancy, other paths wouldn't give me this. I lost my father when I was nine, it was devastating, he had a tumor, he had to fight for his life, but he didn't make it, and he suffered a lot. I could fight to give life, why deprive myself of a chance that is given to me? They assured me that I wouldn't risk my life, at worst, my body would reject the uterus. I have never ruled out other paths, surrogate motherhood and adoption, and I will do both regardless of how it goes. If you want, nothing is impossible"*. When the possibility of a uterus transplant for Giorgia arises, her husband does not want it, he is afraid for her, for her health, but the woman's motivation is too strong, and she will be able to convince him. Giorgia also tells how she experienced the moment of waiting and then of the call in which she was informed that the organ was available for her. She says that she thought above all the donor and the donor's family. In fact, when Giorgia learned that the uterus could only be transplanted from a deceased donor, she was initially not in agreement. *"I said to myself: and I have to hope that a young woman, a young mother has to die and leave her children, her family! Can't you be a living donor? Then little by little I calmed down, but my thoughts always go to my donor. I learned that she was a 37-year-old woman with two children, and she died of a sudden heart attack."* As she tells this story, Giorgia cries, she is very upset. *"But then I think she knows who I am, what my suffering is and, if I can make my dream come true thanks to this gift, I would be happy. I will write a thank you letter to send to her family, which I hope they will appreciate, it must not be easy for this family to move on"*. Giorgia always repeats, in her speeches, *"I am a Rocky, now it is easier for me to talk about it, I thought I was an alien, now I feel less alone"*. She abbreviates the MRKH syndrome with the name "Rocky". She is asked why she uses this name and the reason for this abbreviation. She answers: *"I always think of Rocky Balboa, if we look at each other one by one, not in our physical or mental fragility, we must think of Rocky Balboa, always in the ring, that day must come for us too when we will shout that Adriana of liberation, a beautiful victory"*. In August 2020, a compatible deceased donor uterus became available at an Italian hospital. Giorgia received a uterus transplant on 08/21/2020, during the COVID-19 pandemic. The recipient was informed that surgical removal of the received uterus could be performed later, recommended due to medical (i.e. immunosuppression and rejection) or surgical (i.e. cesarean section) complications. After surgery, the patient was monitored and evaluated by cervical biopsies, pelvic ultrasound with Doppler of the uterine vessels, and hormone assays every 15 days for the first 3 months and then once a month for the following 3 months. All biopsies showed grade 0 mucosal rejection, confirming the success of the uterus transplant. In January 2022, Giorgia began her pregnancy after various in vitro insemination procedures. The pregnancy progressed regularly, without symptoms or pathologies until week 30, when she tested positive for SARS-CoV-2 PCR. The patient was admitted to the hospital as a precaution, although she did not report symptoms related to COVID-19 disease. Corticosteroid prophylaxis was performed at the beginning of hospitalization and after 30 days. Finally, the patient underwent an emergency cesarean section in the thirty-fourth week. Giorgia gives birth to a baby girl and gives her the name of the donor. It is the first case in Italy.

2. Materials and Methods

The case report follows the Case Reporting (CARE) guidelines [12]. In the pre-transplant evaluation (T0), Giorgia was administered the Machover Test [13], the Bauman Test [13], the Million Clinical Multiaxial Inventory- III (MCMI-III) [14], the Short Form Health Survey-36 (SF-36) [15], the Patient Health Questionnaire (PHQ-9) [16], and the General Anxiety Disorder-7 (GAD-7) [17]. The same instruments were re-administered 1 year (T1) and 2 years after the transplant and the birth of the baby girl (T2).

2.1. Machover test

The Machover or human figure test is a projective test that appeals to the spontaneous production of the subject and can be administered to both children and adults. The test is easy to administer, the subject is presented with a sheet of paper, a pencil and an eraser and asked to draw a person or a human figure. The most important thing is to leave the subject free to project. At the end of the drawing, the subject is asked to draw a figure of the opposite sex and if the sex and age have not been specified, it is good to ask. The main aspect of this test is that the drawing of the human figure is the projection of the image of one's own body and self [13].

2.2. Bauman Test

The Bauman Test or tree drawing was created by Emil Jucker to arrive at a personality diagnosis and, subsequently, Karl Kock gave this technique an objective validity by publishing a manual in 1949. The tree would be the symbol of man for his upright position and tells us something about his personality. Also, in this case the test can be administered to both children and adults and is easy to administer. The subject is presented with a sheet of paper and a pencil and asked to draw a fruit tree as one can [13].

2.3. Million Clinical Multiaxial Inventory-III (MCMI-III)

The MCMI-III is a personality test that considers the latter as a manifestation of the entire complexity of the person with a symptomatology that manifests itself in numerous clinical areas. Among the most important characteristics of the test, we find its relative brevity, the theoretical basis, the multiaxial format, the construction of three stages of validation, the use of prevalence scores and the interpretative depth. The MCMI-III is composed of 175 items and 24 clinical scales, a very basic vocabulary is used, corresponding to that of the third year of middle school, and the duration is approximately 20-30 minutes [14].

2.4. Short Form Health Survey-36 (SF-36)

The SF-36 is a very popular questionnaire for the assessment of health-related quality of life. The SF-36 includes 8 scales: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE) and mental health (MH). From these scales, two dimensions can be derived: one regarding physical health and one regarding mental health [15].

2.5. Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 is a test for the evaluation of depression according to the criteria of the Diagnostic and Statistical Manual of Psychiatry (DSM-V) [11], in which the patient is asked if he/she has experienced any depressive symptoms in the previous two weeks. It is composed of 9 items on a Likert scale ranging from 0 "never" to 3 "almost every day" [16].

2.6. General Anxiety Disorder-7 (GAD-7)

The GAD-7 is a test that has the function of evaluating whether there are anxious tendencies according to the criteria of the Diagnostic and Statistical Manual of Psychiatry (DSM-V) [11], in which the patient is asked if he or she has experienced any anxious symptoms in the previous two weeks. It is composed of 7 items on a Likert scale ranging from 0 "never" to 3 "almost every day" [17].

3. Results

Regarding the study of personality, at time T0, the administration of the MCMI-III highlighted obsessive-compulsive (scale 7=87), histrionic (scale 4=100) and narcissistic (scale 5=70) personality patterns. Item 27 "If I have the chance, I prefer to do things alone" highlighted the presence of alienation in interpersonal relationships. Regarding the patient's psychodiagnostic evaluation through quantitative tests, no significant changes were highlighted in the results related to the three administration times (T0,T1,T2). In fact, the quality of life always remains adequate. Only social functioning have undergone a decrease in the period of lockdown caused by the COVID-19 pandemic, during which the patient herself reports having greatly reduced all interpersonal relationships. While the dimensions related to physical health (role physical and general health) have slightly reduced during the last months of pregnancy, a period in which the patient reports feeling more tired and fatigued than usual. Figure 1 shows the results relating to anxiety, depression and quality of life symptoms at the three administration times (T0, T1, T2). The results of the projective graphic tests (Machover test and Baumtest), in the three evaluation times (T0, T1, T2) deserve a more in-depth qualitative comment.

3.1. Pre-transplant evaluation (T0)

3.1.1. Machover Test

The drawing of the human figure has shown a figure younger than the individual, indicating possible regression. The pupils are absent in the eyes, indicating difficulty in interpersonal contact. The placement of the figure on the sheet is central, indicating good balance and adaptation. The figures appear to be moving, indicating good psychic dynamism. The outline of the drawing appears at times weak and at times firm, indicating a possible ambivalence between feelings of insecurity and impulsiveness. The hair and eyelashes appear well-groomed, a sign of narcissism and needs towards the sexual sphere. The very long arms indicate a need for protection [13].

3.1.2. Baumtest

The tree is drawn in the upper part of the sheet, and its upper parts are accentuated (short trunk, large crown), an indication of intellectual vivacity, spiritual interests and ideals. The representation of the roots indicates possible regression. The base of the trunk seems to widen towards the right, an indication of distrust and caution. The crown tends to be accentuated on the right, an indication of extroversion, the need to assert oneself and, at the same time, weakness of the ego, uncertainty. The presence of flowers in the crown suggests the need to adorn oneself, the desire to appear and the tendency to take care of one's appearance. In the crown there are also fruits that indicate the ambivalence between the need for success, the desire to succeed and infantile traits [13].

3.2. Evaluation one year after transplant (T1)

3.2.1. Machover test

The attribution of an age lower than one's own was confirmed, indicating possible regression. The pupils were absent in the eyes, indicating difficulty in interpersonal contact. The facial expression of the drawn figure now appeared more restless and almost alienated. The size of the figure compared to the sheet was smaller, indicating insecurity and inhibition. The position of the figure was shifted to the left, indicating attachment to the past. The figure appeared rigid, indicating psychic rigidity. The outline of the drawing appeared weak and light, indicating insecurity and anxiety. Anxiety was also confirmed by the presence of shading. The arms were also very long, indicating a need for protection. Finally, pockets and buttons were present, indicating an infantile personality and dependent on the mother [13].

3.2.2. Baumtest

The tree was now depicted towards the left, indicating attachment to the past, to the mother, and infantile regression. The accentuation of the upper parts of the tree (large crown) meant intellectual

vivacity, spiritual interests and ideals. The representation of the roots indicated regressive tendencies. The crown tended to be accentuated on the left, indicating introversion, and egocentrism. The tip of the trunk and most of the branches tended towards the left, indicating attachment to the past, and narcissism. The tree seemed to rest on a flowerbed, indicating feelings of loneliness and abandonment. Decorative accessories were present in the crown and there were also some fruits, indicating ambivalence between the need for success, the desire to succeed and infantile traits [13].

3.3. *Evaluation two years after transplant and maternity (T2)*

3.3.1. Machover test

The eyes of the figure were depicted without pupils, indicating difficulty in interpersonal contact. The expression of the female figure appeared aggressive. The size of the figure compared to the sheet was disproportionate and much smaller, indicating insecurity, inhibition, with a sense of inferiority and depression. The position of the figure on the sheet was shifted to the left, indicating introversion and attachment to the past. The figure appeared static, indicating psychic rigidity and hypercontrol. The outline of the drawing of the figure appeared weak, indicating feelings of insecurity and anxiety. Anxiety was also confirmed by the shading present in the drawings. In the figures the hands appeared like closed fists, indicating repressed aggression, the long arms indicated the need for protection [13].

3.3.2. Baumtest

The tree was depicted facing left, indicating attachment to the past, to the mother, and infantile regression. The accentuation of the upper parts of the tree (large crown) meant intellectual vivacity, spiritual interests and ideals. The representation of the roots indicated affective regression and infantilism. The tree seemed to rest on a flowerbed, indicating feelings of loneliness and abandonment. Decorative accessories were present in the crown, and there were also flowers, indicating the need to adorn oneself, the desire for praise and the tendency to pay attention to externals [13].

4. Discussion

The concept of regaining childbearing ability via uterus transplantation motivates many infertile women to pursue giving birth to their own children. However, challenges exist owing to donor, recipient, and fetus. Both women and children of uterus transplantation need special consideration due to prematurity-related neonatal problems and the long-term effects of transplant pregnancy [18]. Although uterus transplantation seems to have a positive effect on self-image there is a lack of knowledge about how women who have received uterine grafts experience pregnancy attempts, pregnancy itself and the first years of motherhood. There are real psychological strains in motherhood after uterus transplantation, such as the concern the women expressed relating to health of the child and the effects of immunosuppressants [19]. This aspect did not seem to have disturbed the patient, who, although aware of the risks, decided to go ahead, since her desire for motherhood was stronger than everything else. Regarding psychosocial outcomes there are many potential stressful events for motherhood after uterus transplantation and these events may have impacts on quality-of-life and mental well-being. Adjusting to a new role as a parent after a uterus transplant can require significant adjustment and may lead to identity conflicts [20]. In our case, for example, with the role of parent Giorgia discovers a difficult and complicated relationship with her mother, in which her expectations regarding a grandmother present with her daughter and granddaughter will be disappointed. The patient reported that her mother was more present during the period in which the transplant path was being attempted. The projective graphic tests highlighted some significant aspects that changed over time: the facial expression of the female figure became more restless in subsequent evaluations, until aggressiveness emerged (clenched fists) in the last evaluation. The tree will also be drawn on a flowerbed in the last evaluations, indicating a sense of loneliness and abandonment. The feeling of loneliness and abandonment, which appeared during pregnancy and remained even after the birth of the child, could be linked to the dissatisfaction that the patient

expressed regarding the relationship with her mother. The patient reported how her mother was a grandmother who was not very present with her and her granddaughter: "she doesn't help me with anything, she only thinks about herself" ... Regarding health-related quality-of-life, however, no significant changes were highlighted in the results of the three evaluation times. There were no limitations in the emotional role. Only social activities decreased during the lockdown period caused by the COVID-19 pandemic, during which the patient herself reported having reduced all interpersonal relationships. Overall, the strong desire for motherhood and the assumption of the new role of mother after a long period of infertility required the patient to make a significant psychological adjustment, which was made possible by the continuous psychological support received, from pre-transplant to post-transplant and even after the birth of the child. Studies show high interest in uterus transplantation among potential recipients, with 61% of MRKH syndrome patients preferring it as their first choice for parenthood [21]. The Dallas Uterus Transplant Study reported a 55% live birth rate per attempted transplant and 79% per technically successful transplant. However, this procedure is not without its challenges [22]. Studies have shown that uterus transplantation recipients and their partners generally exhibit psychological stability before and after the procedure, with scores similar to or better than relevant norm groups [23]. However, recipients may experience psychological issues including adapting to life with a transplanted uterus, compliance with immunosuppressive treatment, and managing expectations throughout the process [24]. Overall, uterus transplantation appears to be psychologically well-tolerated, but ongoing evaluation and psychological support are essential. As uterus transplantation programs develop worldwide, they aim to meet the demands of well-informed patients seeking this innovative fertility treatment [20, 24].

5. Conclusions

Uterus transplantation has emerged as a promising option for women with absolute uterine factor infertility to achieve genetic and gestational motherhood. Maternal, obstetric and mental health complications may occur, requiring careful management and a multidisciplinary approach including physicians, psychologists and psychiatrists are needed.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the patient(s) to publish this paper.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Conflicts of Interest: The authors declare that they have no competing interests.

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