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Case Report

Obstetrics and Gynaecology Section

Human Amnion Grafting for Vaginal Agenesis in Mayer-Rokitansky-Kuster-Hauser Syndrome: A Case Report

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ABSTRACT

Vaginal agenesis is a congenital condition of the female genital tract. Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome is a disorder characterised by agenesis of Mullerian structures, including the uterus and upper two-thirds of the vagina, with normally developed secondary sexual characteristics. The author presents a case of a 21-year-old married woman with primary amenorrhoea diagnosed with type 1 MRKH syndrome. The patient underwent the modified McIndoe vaginoplasty procedure with the use of a human amnion as a graft for creating a neovagina. The patient was discharged fifteen days postsurgery with training on the use of vaginal dilators. The patient was followed up weekly to assess vaginal patency. At the end of three months, the patient had approximately 7 cm of neovaginal length.Sexual intercourse was recommended thereafter.Modified McIndoe vaginoplasty with a human amnion graft is an effective, simple, safe procedure with high acceptability and a good enough functional vagina in women with MRKH syndrome.

Keywords: Modified McIndoe vaginoplasty, Neovagina, Primary amenorrhoea, Vaginal dilators

CASE REPORT

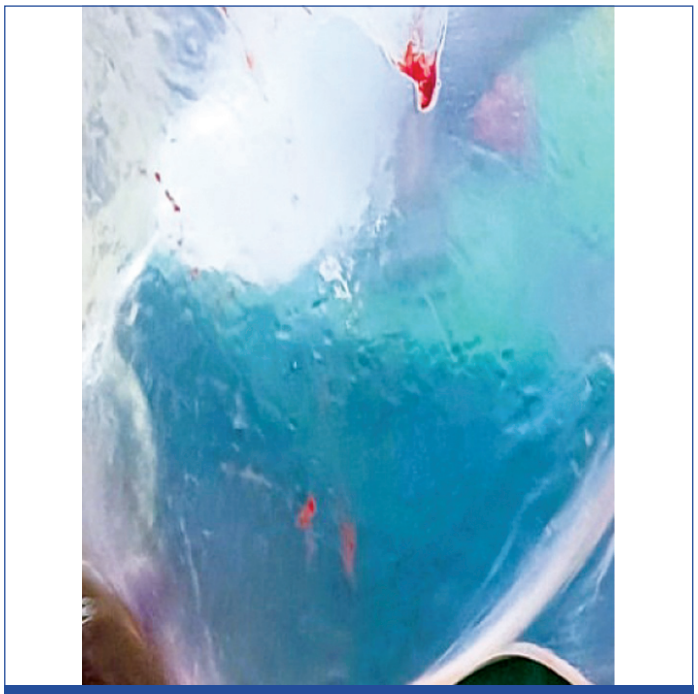
A 21-year-old woman, married for eight months, presented with primary amenorrhoea. Examination showed normal secondary sexual characteristics but a vaginal dimple with no distinct orifice. Ultrasonography suggested an absent uterus with both ovaries appearing normal, and Magnetic Resonance Imaging (MRI) of the abdomen and pelvis confirmed Type 1 MRKH syndrome [Table/Fig-1]. The authors planned a modified McIndoe vaginoplasty using a human amnion graft to create the neovagina.



[Table/Fig-1]: MRI images of the abdomen and pelvis in the midsagittal view.

Before admission, the patient received a detailed explanation of the procedure, its process, potential side-effects, and the importance of strict follow-up, along with in-depth psychological counselling. Because the amnion of another individual was to be used to line the neovaginal cavity, written consent was obtained, and the patient's concerns about the possible transmission of hepatitis and Human Immunodeficiency Virus (HIV) were addressed directly.

Patient fitness for surgery was evaluated, and she was admitted only after an elective caesarean section had been scheduled, as a new amnion was required. The bowel was prepared the night before the operation.Following an elective caesarean section, the human amniotic membrane was collected under sterile conditions from a seronegative donor. The outer surface of the amnion is visually distinct from the inner surface of the chorion, which makes the two layers easy to separate. The membrane was rinsed with balanced saline solution containing antibiotics to remove blood clots, then prepared for placement on the mould [Table/Fig-2].



[Table/Fig-2]: Amnion graft.

The mould itself was fashioned from a 10 cm syringe wrapped in a sterile sponge to a diameter of 5 cm, secured with linen thread and sheathed in a condom. The prepared amnion graft was then positioned over the mould and stretched across its surface [Table/Fig-3a-c].



[Table/Fig-3a]: A 5 cm diameter achieved by wrapping syringe with sterile sponge.

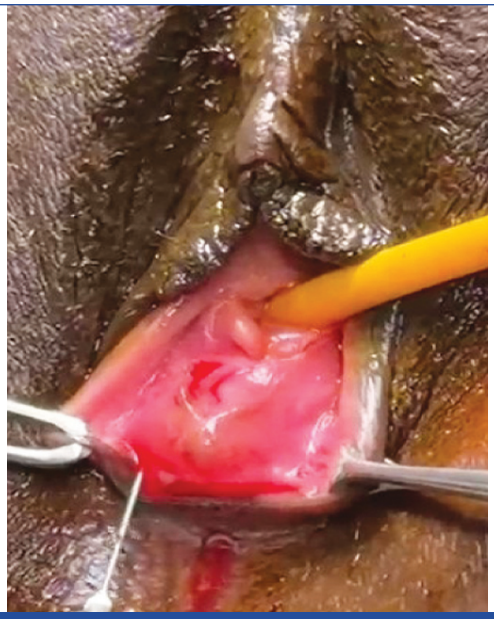


[Table/Fig-3b]: A 10 cm syringe wrapped in a sterile sponge secured with linen thread.

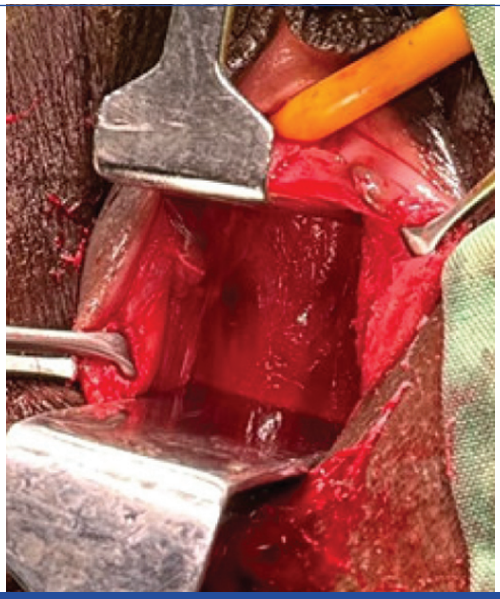


[Table/Fig-3c]: Amnion graft positioned over the mould.

The patient was positioned in the lithotomy position under regional anaesthesia.The bladder was catheterised with a Foley catheter. The perineum was cleaned and draped in the standard protocol. A small incision was made at the vaginal dimple [Table/Fig-4]. Blunt dissection created a potential space between the bladder anteriorly and the rectum posteriorly, and sharp scissors were used to divide the midline septum, converting the space into a single cavity. Throughout, the assistant's gloved finger guided the dissection to prevent it from proceeding too far posteriorly. This produced a neovaginal cavity approximately 10 cm deep and 5 cm in diameter [Table/Fig-5]. Once haemostasis was secured, the freshly prepared amnion graft was placed within the newly formed vaginal walls [Table/Fig-6]. The graft was fixed to the edge of the neovaginal canal with 2-0 Vicryl sutures, and the labial margins were sutured together at the midline to hold the mould in place [Table/Fig-7]. A sterile compression bandage completed the dressing.



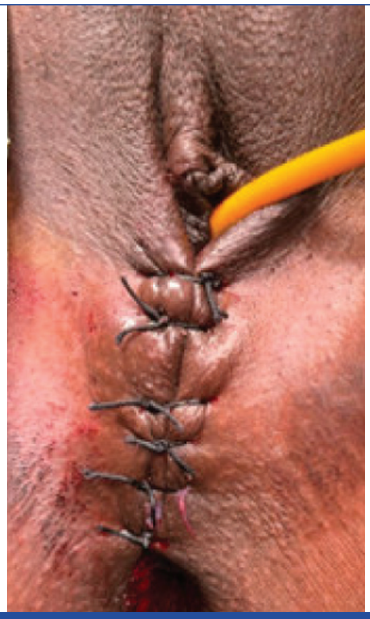
[Table/Fig-4]: Vaginal dimple.



[Table/Fig-5]: Length of neovagina approximately 10 cm deep and 5 cm in diameter.



[Table/Fig-6]: Human amnion graft over the mould placed within newly formed vaginal walls.



[Table/Fig-7]: Labial margins sutured at the midline to hold the mould in place.

A urinary catheter stayed in place for one week after surgery. During this time, the patient was nursed in a head-low position and given a liquid-soft diet. The patient was given prophylactic antibiotics for five days, and the labial stitches were removed on the seventh day. The mould was gently withdrawn at this point. The graft had taken well. The patient was discharged two weeks after surgery with training on the use of vaginal dilators. The patient was followed up weekly for three months to assess vaginal patency.She was then taught to insert, use, and clean the vaginal dilators herself. For the first three months, The patient used lubricated dilators and continued dilating the neovagina for 10-15 minutes per session, three to five times daily, with excellent compliance. At the end of three months, an approximate 7 cm vaginal length was maintained, with good epithelialisation of the vagina [Table/Fig-8].



[Table/Fig-8]: Neovagina showing good epithelialisation at 3 months.

After three months, the patient was permitted to resume and maintain sexual activity, which helps prevent the neovagina from contracting.

DISCUSSION

Vaginal atresia can be congenital or acquired. MRKH syndrome is a congenital condition caused by embryologic underdevelopment of the Mullerian duct, with resultant agenesis or atresia of the vagina, uterus, or both. The incidence of congenital atresia is 1 in 4000 to 5000 live births [1]. MRKH syndrome comprises Type-I (isolated Mullerian agenesis) and Type-II (MURCS: Mullerian Duct Aplasia, Unilateral Renal Agenesis, and Cervicothoracic Somite Anomalies association). MRKH can cause significant physical, psychological, and social distress; treatment primarily aims to create a functional vagina of adequate length for satisfactory sexual function [2]. A range of surgical and non surgical approaches exist for vaginal construction, each carrying its own advantages and limitations.

The non surgical method described by Frank relies on self-dilatation with graduated dilators and can take several months to establish a functional canal; its success depends largely on the patient's consistency with ongoing dilatation, her compliance, and the quality of counselling she receives [3].

Surgical procedures are performed when the patient is mature enough to give informed consent and to appreciate the importance of postoperative dilatation. Ideally, it is performed in late adolescence or early adulthood -between 18 and 20 years of age - either before marriage or shortly afterwards [4].

Several surgical techniques have been described for constructing a neovagina, including the Abbe-McIndoe procedure, bowel segment vaginoplasty, pudendal-thigh flaps, peritoneal or bladder mucosa grafts, human amnion grafts, the intercede absorbable adhesion barrier, autologous buccal mucosa grafts, and laparoscopically assisted peritoneal pull-through techniques such as the Vecchietti or Davydov procedure [5]. Each graft material carries its own merits and drawbacks. Human amnion is regarded as the best choice, being non-immunogenic; it has antimicrobial activity by secreting lysozymes, which reduce the risk of infection. It attaches securely, protects granulation tissue, prevents epithelial apoptosis, and hastens epithelialisation through its pluripotent properties,which allow metaplasia to change into squamous epithelium [6-8].

Sarma HK reported encouraging outcomes, with 92.8% structural correction and 85% functional correction at the end of one-year follow-up [8]. Similarly, Mohammady N et al.,observed good epithelialisation using a mould for self-dilatation over the same period [9], while Sharma D et al., reported an 88% success rate after amnion graft vaginoplasty in 17 patients [10]. Bhandari S et al., reported a case of a 23-year-old girl with normal secondary sexual characteristics who presented with primary amenorrhoea with cyclical lower abdominal pain; on examination, a blind vagina was present. Vaginoplasty with an amnion graft was done, and a vaginal mould was placed. Vaginal dilatation with Hegar's dilator was done weekly for six weeks. She was followed up regularly and advised to perform regular manual dilation at home. McIndoe vaginoplasty with amnion graft is a simple yet rewarding procedure, especially in low-resource countries with a good success rate and minimal postoperative complications [11].

The present patient experienced no major complications, though the procedure's known intra- and postoperative risks are well documented. Vaginal stenosis is a common and significant complication of vaginoplasty, particularly when postoperative dilatation is inadequate, leading to shortening and narrowing of the neovagina. Other complications include infection, fibrotic bands, fistula formation, thromboembolic events, and transient urinary spraying. Regular dilatation, appropriate postoperative care, and thromboprophylaxis can help minimise these complications [12]. Chaudhary R et al., for instance, described a urethrovaginal fistula in one patient, while the remainder in their series achieved excellent amniotic graft uptake [12]. The main limitations of the present report are its single-case design and short follow-up period of three months. Although satisfactory neovaginal length and epithelialisation were observed at three months, longer-term follow-up is required to assess the durability of the anatomical and functional outcomes.

CONCLUSION(S)

Modified McIndoe vaginoplasty with a human amnion graft is an effective, simple, and safe procedure. Its success, however, rests on the patient's own commitment to regular self-dilatation and to regular sexual activity, both of which help maintain vaginal length

and calibre. The psychological dimension of this condition deserves equally serious attention, making thorough counselling an essential part of care.

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