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Case Report

Creating neovagina using amnion

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Introduction

Congenital absence of vagina is a rare developmental abnormality with an occurrence of 1 in 4000–5000 births,¹ and known as Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome characterized by failure of Mullerian ducts to develop, resulting in rudimentary uterine horns and fallopian tubes and absent vagina. Chromosomal constitution is 46XX²; their gonads are normal ovaries having adequate hormonal and ovulatory function, with normal secondary sex characteristics. External genitalia are normal, hence diagnosis is missed at birth but usually diagnosed after puberty when these young patients report for investigation of primary amenorrhea. The condition can affect them emotionally and sexually, causes them social embarrassment, and results in poor self-image.

There is no treatment except to create a vagina for sexual function, which should be satisfying to both partners. A case of vaginoplasty by using amnion is presented, and different modalities of treatment and advantages of this procedure are discussed.

Case report

A 19-year-old female patient reported with history of primary amenorrhea; she had no other complaint. Her height was normal (155 cm), weight was 46 kg, and breast development and other secondary sex characteristics were normal. Her axillary, pubic hair, and external genitalia were normal; vagina was absent. No mass could be felt on rectal examination. Karyotype was 46XX; ultrasonography of abdomen and pelvis showed absent uterus with normal kidneys. Radiograph spine was normal. Her parents were contemplating her marriage with a widower who had children from his first wife. She was explained and counselled about the creation of neovagina for sexual function. She was then prepared for surgery.

A soft mold of 5 cm thickness was created by rolling a piece of sponge of 10 cm width over a Foley's catheter, on which three side holes were made. The sponge was secured over the catheter using silk, and it was covered with double condom where the open end of condom was tied with silk (Fig. 1). Amniotic membrane was retrieved from a patient who had

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Fig. 1 – Soft mold made of sponge.

delivered about an hour back. It was peeled off from the chorion. The membrane was rinsed and cleaned repeatedly in normal saline solution mixed with cephalosporin antibiotic. The membrane was kept in this solution till used. The soft mold was covered with the prepared amniotic membrane. Under general anesthesia she was cleaned, draped, put in lithotomy position, and bladder was catheterized. Diagnostic laparoscopy (Fig. 2 – inset) was performed to look for the gonads. A space (Fig. 2) was created by sharp and blunt dissection beginning from the fourchette. This was done carefully to avoid injury to bladder and rectum by inserting a finger in the rectum. Visualization through laparoscope was obtained to ensure peritoneal integrity. Meticulous hemostasis was ensured and mold was inserted, after creating negative pressure by suction on Foley's catheter to reduce the thickness. After insertion, pressure was released so that the mold could fit snugly, and labia (Fig. 3) closed over the mold and T bandage applied. She was put on bed rest for 3 days, on IV fluids and oral fluids to avoid bowel movement; antibiotics were continued. Urinary catheter and mold were removed after 7 days. The amnion lining had been taken up and the cavity was gently cleaned. A well-lubricated acrylic mold (Fig. 4) was inserted and T bandage applied again. Patient was taught to remove and reinsert the mold at the time of bladder and bowel evacuation. She was discharged 2 weeks later. The mold was worn continuously for 2 months and later only at night; her compliance was very good.

Fig. 2 – Space created between the urethra and bladder in front and the rectum behind (inset – laparoscopy).

Fig. 3 – Soft mold inserted.

Fig. 4 – Acrylic mold for self-dilatation.

Neovagina had adequate depth (Fig. 5) and good epithelization after 3 months. She was reviewed after marriage and had satisfactory intercourse. She was advised regarding regular dilatation to avoid stenosis.

Fig. 5 – Adequate depth of vagina at review after 3 months.

Discussion

The commonest cause of vaginal agenesis is MRKH syndrome, which is of two types,³ type 2 is associated with abnormalities in other parts of the body like renal or skeletal system.

Various treatments have been proposed for vaginal agenesis; the basic aim is to create a canal at the normal anatomical position and axis of vagina for sexual function. Nonsurgical treatment for creation of vagina can be achieved by progressive dilatation (Frank technique); it is an appropriate first-line treatment. This therapy has been recommended because it is minimally invasive and inexpensive.

There are many surgical techniques for creating a vagina, with McIndoe procedure being the oldest and still satisfactory.^{4,5} Originally, the space was lined with split thickness skin graft. Several investigators have described modifications of McIndoe procedure, where different materials like peritoneum, amnion, artificial dermis, autologous buccal mucosa, intestines, or myocutaneous flaps have been used for covering the cavity. Amniotic membrane is cheap, readily available, provides protective covering, and there is no rejection as it does not express any antigenicity.⁶ There are no problems of donor site of skin graft. Amniotic membranes have been used successfully for wound healing and reconstructive surgery since the early 20th century⁷; it has also been used in obstetrics/gynecology surgery, dentistry, and neurosurgical applications. In 1934, Brindeau⁸ used human amnion to construct the vagina for a patient with Mullerian agenesis. Subsequently, its use has been reported by many authors.^{9,10} The amniotic membranes with meconium staining, suspected chorioamnionitis or premature rupture, and patients with HIV, Hepatitis B, and other transmissible infections should not be used for grafting. This provides a natural layer for wound healing and contains various important growth factors and biological macromolecules important in wound healing. These molecules have been scientifically found to confer properties that reduce wound pain, suppress infection, suppress scar formation, and provide anti-inflammatory mediators.¹¹ The human amniotic membrane is capable of complete metaplasia into mature squamous epithelium.

Sponge mold was easy to prepare to the right size, cheap, light in weight, and spongy enough to prevent extreme pressure on the surrounding viscera thereby preventing tissue pressure and necrosis.

Many other techniques like laparoscopic Vecchietti technique,¹² sigmoid vaginoplasty, and balloon vaginoplasty have been used. These are complex procedures and require sophisticated equipment. Another simple technique is Williams vaginoplasty, in which the labia are fused to create a pouch is another technique of creating neovagina.¹³

The timing of the surgery depends on the need of the patient and the type of procedure planned. Surgical procedures should be performed when the patient is mature enough and ready for intercourse. The other issue of concern is 'Fertility and Childbearing'. Fertility using surrogacy and assisted reproductive techniques may be an option for these

patients. Female offsprings of women conceived by assisted reproductive techniques have normal reproductive tracts. The mode of inheritance of Mullerian agenesis is unclear¹⁴ though familial aggregates of this condition have been reported.

Conflicts of interest

The author has none to declare.

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