VAGINOPLASTY BY USING AMNION GRAFT IN PATIENTS OF VAGINAL AGENESIS ASSOCIATED WITH MAYOR-ROKITANSKY-KUSTER-HAUSER SYNDROME

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Background: Vaginal agenesis is congenital anomaly of the female genital tract and may occur as isolated developmental defect or as part of a complex of anomalies. The aim of this study was to determine the effectiveness of vaginoplasty by using amnion as graft in the creation of neovagina for patients with Mayor-Rokitansky-Kuster-Hauser Syndrome. **Methods**: this is a retrospective study of 28 cases of vaginal agenesis associated with Mayor-Rokitansky-Kuster-Hauser Syndrome, over the period of 20 years, in which vaginoplasty was done by modified McIndoe procedure by using amnion as graft. **Results**: vaginoplasty using amnion graft was successfully performed in all except one case in which rectum got opened and procedure was abandoned after the repair of rectum. The functional results were quite satisfactory. Except one case none had any significant peri-operative complication. Post surgical results were acceptable to the patients sexually and aesthetically. **Conclusion**: Although new techniques of vaginoplasty have evolved over the years using laparoscopic approach and by use of different materials as graft, vaginoplasty with amnion graft is still a safe and effective procedure to treat patients of vaginal agenesis. The technique is simple and safe and provides a satisfactory and functional vagina in majority of the patients.

Keywords: vaginoplasty, amnion graft, vaginal agenesis, vaginal atresia, Mayor-Rokitansky-Kuster-Hauser Syndrome

INTRODUCTION

Vaginal agenesis is congenital anomaly of the female genital tract and may occur as isolated developmental defect or as part of a complex of anomalies.[1] vaginal agenesis is estimated to occur in 1 in 4000-5000 live female births.[2] vaginal agenesis is most commonly associated with Mayor-Rokitansky-Kuster-Hauser (MRKH) syndrome and androgen insensitivity syndrome.[2] MRKH syndrome is a congenital malformation characterised by an absence of the vagina associated with a variable abnormality of the uterus and the urinary tract but functional ovaries.[3] Two types of this syndrome are described. Type-I MRKH syndrome is characterised by an isolated absence of the proximal two thirds of the vagina, whereas type II is marked by other malformations; these include vertebral, cardiac, urologic (upper tract), and otologic anomalies.[4] Patients with MRKH syndrome and vaginal agenesis are phenotypically and genotypically female with a 46XX karyotype.[1]

Although numerous methods for creating a neovagina have been proposed, there is no unanimity of opinion concerning which procedure should be chosen. The most commonly used techniques to create a neovagina are the non surgical Frank technique, which relies on serial dilation of vaginal pouch and surgical Vecchietti technique (continous pressure). The Abbe McIndoe procedure in which split thickness skin graft is used to cover a stent inserted into a surgically created space between the bladder and rectum.[4] several investigators have described modifications of the Abbe McIndoe procedure, including methods that use amnion[5,6], peritoneum[7], intercede[8], artificial dermis and recombinant basic fibroblast growth factor[9], autologous buccal mucosa[10] and rotational flap procedures using the pudendal, thigh, gracilis myocutaneous, labia minora and other fasciocutaneous flaps[4]. In addition bowel vaginoplasty using segment of sigmoid colon or ileum to line newly formed vaginal canal is also used and some centres are now using laparoscopic approach for it.[11] Williams vaginoplasty and its modifications is another technique.[12] Latest techniques include robotic sigmoid vaginoplasty[13] and laparoscopic formation of neovagina followed by extraperitoneal traction on Foley's catheter.[14]

In 1910 Davis was the first to report the use of foetal membranes as surgical material in skin transplantation. Since then the use of amniotic membrane in surgery has been expanded.[15] we present a personal series of creation of neovagina by modified Abbe McIndoe method using amnion as graft material in patients presented with MRKH syndrome. The aim was to create functionally and cosmetically normal neovagina using simple available technique and to bring this operation to the attention of gynaecologists.

PATIENTS AND METHODS

The study was conducted at Ayub Teaching Hospital Abbottabad from January 2009 to June 2009. It included patients of MRKH syndrome diagnosed and treated at Women and Children Hospital Abbottabad and Ayub Teaching Hospital Abbottabad over the last 20 years, i.e., from 1989 to 2009. Only those patients who were married or about to get married in near future (three

months before marriage) were operated and included in study due to our social setup. It is a descriptive study with data collected retrospectively. All patients exhibited primary amenorrhoea, normal female secondary sex characteristics and a vaginal dimple without vaginal orifice. Patients underwent pre-operative workup which included apart from routine investigations karyotyping, abdominopelvic ultrasound and diagnostic laparoscopy. Patients and their parents were thoroughly counselled before operation about the optimal operation time, method as well as the possible complications of the procedure. All patients were followed for at least 6 months.

Amniotic membranes were obtained under sterile conditions from elective Caesarean deliveries. Amnion donors (mothers) were screened for hepatitis B and C as well as HIV viral infections and syphilis. Inner amniotic membrane was separated from outer membrane and rinsed in sterile normal saline solution containing cephalosporin injection.

Under general anaesthesia, the patient was placed in lithotomy position after catheterisation and perineal area cleaned and draped. A transverse incision was made just below the dimple and a potential space was created in between the bladder and urethra and rectum by blunt dissection, carefully palpating the catheter in front and a finger in the rectum to guard against the injury. A cavity size of depth 8–10 cm in length and about 4–5 cm in diameter were achieved.

A vaginal mould made with 50 ml syringe wrapped with foam, covered with latex condom and sterilised in cidex solution was then wrapped with amnion tent and placed in the constructed cavity. The amnion graft was fixed to mould by suturing the edges of amnion to the mould. The labia majora was then sutured together loosely with silk sutures to hold the mould in position and T bandage applied. Prophylactic antibiotics were given for 7 days. Mould was removed on day 8 along with catheter. The graft was retained and well taken in all the cases. Vaginal douching was done with pyodine and second mould made with 20 ml syringe (with upper drainage hole created) was kept in place. Patients were counselled about the method of placement, removal and washing of mould to facilitate the further change of mould herself. Patients were discharged with the advice to wear the mould for 3 months continuously followed by nightly insertions for another 3 months to prevent contractions. Fortnightly follow up visits were advised. Physical relation was allowed after 3 months in married women.

RESULTS

A total of 28 females underwent the surgical procedure during these 20 years. Their ages ranged from 16 to 22 years; 26 (93%) were unmarried and 2 were married. The unmarried females presented with primary amenorrhoea; the married ones with primary amenorrhoea and inability to have sexual intercourse.

On clinical examination, all subjects had normal female secondary sexual characteristics and the external genitalia were normal female. However all of them had absence of vagina. Ultrasound and Diagnostic laparoscopy revealed a small nodular/ rudimentary/absent uterus in all cases with normal ovaries and distal part of fallopian tubes.

Associated renal tract anomalies were found in 4 patients (14%). These included horse shoe shaped kidney in one (25%), double unilateral kidney in one (25%) and a single kidney in 2 patients (50%).

Karyotypes were performed in 18 patients (64.3%) who showed a normal XX female pattern. Serum testosterone levels were done in 15 cases (53.6%) with normal female levels.

The operation times ranged from 20–45 minutes. There was immediate per-operative complication of rectal injury in 1 patient requiring abandonment of vaginoplasty; the remaining patients underwent successful vaginoplasty. Outcome of vaginoplasty at 3 months showed that 24/27 (89%) had normal recovery with vaginal depths of up to 7 cm. Three patients (11%) had vaginal constriction due to poor compliance with second mould placement protocol; digital dilation was performed under General Anaesthesia.

At 6 months follow up, all patients had adequate vaginal lengths and diameters. All of them had normal sexual intercourse after 3 months of surgery (unmarried patients also got married by then) obviating the need for second mould placement.

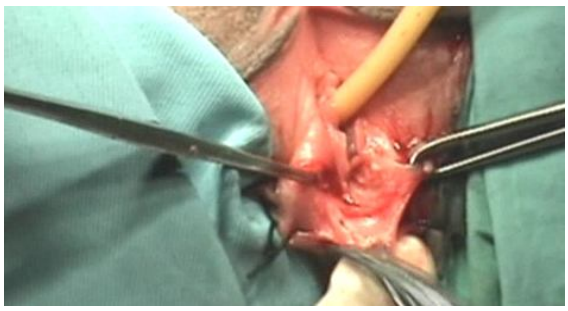

Figure-1: Before surgery

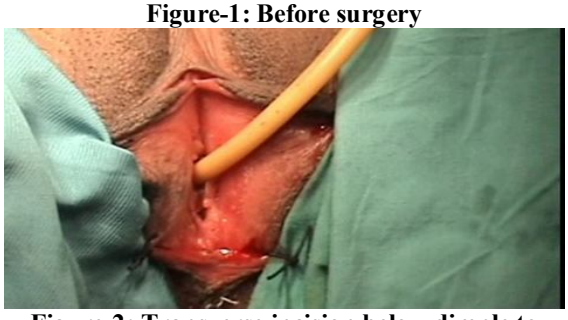

Figure-2: Transverse incision below dimple to create potential space

Figure-3: Mould

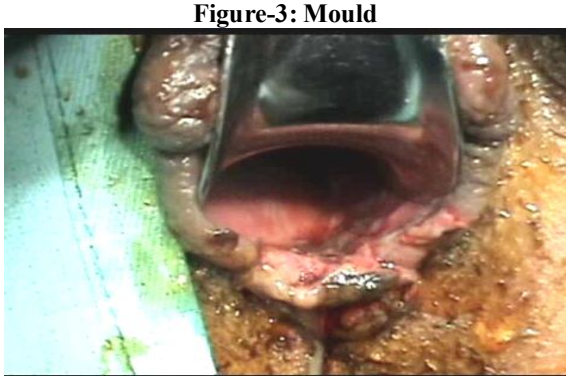

Figure-4: Mould removal on day 8

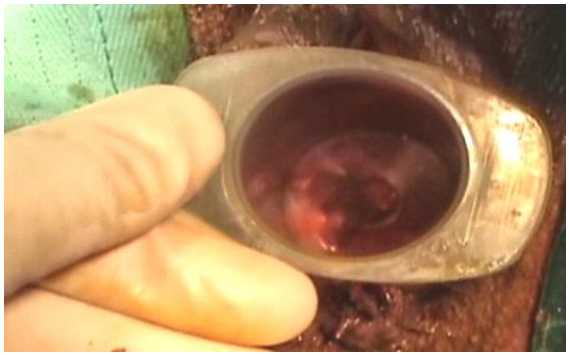

Figure-5: Second mould placement

Figure-6: 3 months after surgery

DISCUSSION

Amniotic membranes have been used as surgical material in different procedures including as dressing for burned skin, skin wounds and chronic leg ulcers, surgical reconstruction of vagina and repair of omphalocoeles, and to prevent tissue adhesions in surgical procedures. It has also been used in treating variety of ocular surface disorders.[15]

We selected amnion as graft for vaginoplasty over skin/other grafts because it is easily available and its supply is nearly unlimited. Amniotic membranes do not express HLA-A, B or DR antigens hence immunological rejection does not occur. It is also believed to have antimicrobial properties reducing the risks of postoperative infection. Antifibroblastic activity and cell migration/growth promoting activity have also been demonstrated which stimulates epithelialisation.[15] and lastly its preparation method and time did not pose any challenge. Other methods using skin and buccal mucosa and peritoneum may scar the patient.[10] Use of intestine cause continuous profuse secretions and unpleasant odour.[1] Laparoscopic techniques are lengthier and require specialised skills and training. Dilation techniques although simple, require motivation and long term follow up.

Twenty-eight cases were recorded for vaginoplasty. All patients except one (96.43%) had uneventful surgical procedures and successful outcomes. In one patient rectum got opened during the procedure and then the procedure was abandoned. Follow up at 3 months was satisfactory in 89% of patients, while 11% required a minor second procedure in the form of digital dilation due to vaginal constriction secondary to poor compliance. Follow-up at 6 months was satisfactory in 100% of patients in terms of anatomical and functional results.

A study conducted at Lahore in Pakistan in 2006 on 10 patients over 4 years using amnion graft, had similar results. In that study one patient had rectal injury during surgery (90% operative success rate); however operation was carries out after rectal repair. At 6 months they had 80% success rate, one patient had cicatrisation and one was lost to follow-up.[5]

Another study from Germany conducted in 2009 on 7 patients also reported similar outcomes. Operative success was 85.71% and one patient had major operative complication. After 18 months follow up anatomical and functional results were 100%.[6]

Although few studies have used amnion as graft in the creation of neovagina but the results are very satisfying. Advantages of this procedure is that it is safe, inexpensive and easy to perform. Epithelial lining of the neovagina resembling normal vagina is found, which facilitates comfortable sexual intercourse. There is less emotional stress and better cosmetic and economic benefits.

CONCLUSION

The ideal method for vaginoplasty is not currently known and depends on numerous factors including

patient preparedness, surgeon experience, and patient and surgeon preference. Although new techniques of vaginoplasty have evolved over the years using laparoscopic approach and by use of different materials as graft, but in developing country like Pakistan where facilities and expertise for newer techniques are not available freely, vaginoplasty by modified Abbe-McIndoe procedure using amnion graft is still a safe and effective procedure to treat patients of vaginal agenesis.

RECOMMENDATIONS

Vaginoplasty by modified Abbe-McIndoe procedure using amnion graft should be recommended in developing countries lacking modern facilities as well as in developed countries because this procedure is simple, safe and effective and requires less expertise as compared to more modern and sophisticated procedures.

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