

McIndoe Vaginoplasty: Revisited

S Saraf, P Saraf

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Abstract

Objectives: The aim of this study was to determine the effectiveness of McIndoe Vaginoplasty in the creation of a neovagina for patients with vaginal agenesis.

Materials And Methods: This is a retrospective study of personal series of seven cases of vaginal agenesis, which underwent McIndoe Vaginoplasty over a period of 4 years (2003-2006).

Results: McIndoe Vaginoplasty was performed successfully in all seven patients. The functional results were quite satisfactory. None had any significant peri-operative complication. Two patients had minimal graft loss which healed on its own. None of the patients had vaginal stenosis during the follow-up visits. Post surgical results were acceptable to the patients, sexually and aesthetically.

Conclusions: McIndoe Vaginoplasty is a safe and effective procedure to treat the patients of vaginal agenesis. The technique is simple, safe reproducible and provides a satisfactory and functional vagina in majority of the patients.

INTRODUCTION

Vaginal agenesis is one of the most significant congenital anomalies of the female reproductive tract from physical and psychological perspective.

Vaginal agenesis is estimated to occur in 1 in 4,000-5,000 live female births and occurs either as an isolated developmental defect or within a complex of more extensive anomalies.^{1, 2} Vaginal agenesis is most commonly associated with Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome. The MRKH syndrome is described as congenital vaginal agenesis in an individual with normal female genotype, phenotype and normal endocrine status. These patients have a rudimentary development or total absence of uterus, but they have normal ovaries.³

The vaginal agenesis is often associated with anomalies of the renal (34%) and the skeletal (12%) systems.⁴ The Renal anomalies may include unilateral agenesis of the kidney, ectopic kidney(s), horseshoe kidney, and crossed-fused ectopia and skeletal anomalies may include fused vertebrae or other variants.

Patients with vaginal agenesis are often diagnosed late when

the patients present with primary amenorrhea. The patient is an otherwise normal woman with normal secondary sexual characters apart from nondeveloped vagina.

The surgical management of vaginal agenesis is a great technical challenge, the aim being to provide a vagina of an appropriate length, adequate caliber and with aesthetic acceptance.

The procedural details of modified McIndoe Vaginoplasty and details of an improvised vaginal mould have been discussed in this paper. The important steps that need to be highlighted include: creating an adequate sized neovagina, resurfacing the lining by split thickness skin graft and putting an improvised mould.

PATIENTS AND METHODS

Seven patients aged 24 yrs to 28 years underwent modified McIndoe Vaginoplasty, over a period of 4 years (2003-2006). The indications of McIndoe Vaginoplasty in all the cases was congenital vaginal agenesis. All patients exhibited primary amenorrhoea, normal secondary sex characteristics, and a vaginal dimple without vaginal orifice. All patients underwent a pre-operative work-up which

included detailed clinical examination and ultra sonogram of genito-urinary system. A detailed counseling regarding the method as well the possible complication of the procedure was also undertaken. Of these, one case was found to have an entopic pelvic kidney. All the patients were followed at least for 6 months.

Under general anesthesia, the patient was placed in the lithotomy position. After catheterization, the vulvar area was cleaned & draped. A cruciform incision was then made in the introitus and a potential space was created in between the bladder & urethra in front and rectum behind by blunt dissection, carefully palpating the catheter in front and assistant's finger behind. A cavity size of depth 10-12 cm in length and a diameter of 4- 5 cm were achieved. After achieving meticulous haemostasis, the cavity was packed with adrenaline soaked pack. Then Split thickness graft of approximate 4 x 8 inches was obtained either using skin grafting handle or dermatome from the lateral aspect of upper thigh or the buttocks. The graft was finely holed with 11 no. blade and wrapped around a pre autoclaved improvised vaginal mould. The two margins of graft were sutured with 4-0 chromic catgut. The raw cavity was then resurfaced by the graft mounted over the improvised vaginal mould. After putting the graft, a low pressure negative suction was applied to the open end of the red rubber catheter of the mould so as to collapse the mould with the graft, to facilitate easy insertion of the mould with graft in the created neovagina. The free margin of the graft was secured by two to three silk sutures in the labia majora to maintain the mold in position. T-binder over the dressing put. This was further secured by putting an adhesive plaster on the top. The Foley catheter was maintained for 1 week postoperatively and the patient was kept head low and on low residue diet for 5 days. Prophylactic antibiotics (amoxicillin-clavulanate and gentamicin) were used for five days in all the cases. The Dressing change was done on 5th day. The labial stitches were removed and the mould was slowly removed by connecting the free end of the red rubber catheter of the vaginal mould again to suction. The graft was retained and was well taken invariably in all the cases. Thorough vaginal douching was done and the extra graft at the introitus was trimmed out. A fresh previously prepared and autoclaved mould was reinserted and at this time dressing was secured only by the T-binder. Next dressing was carried out after 5 days without anesthesia in the same way. Patient was explained the method of cleaning and inserting the well lubricated mould on her own to facilitate the further change of mould herself. After a month the

sponge mould was replaced by a customized acrylic mould or silastic retainer. The patients were asked to wear the mould almost constantly for three months, and in the night for the next three months. The patient's compliance to this advice was found to be excellent. Physical relation was allowed after 3 months in married women. (Figure 1, 2, 3, 4)

Figure 1

Figure 1: Vaginal agenesis preoperative



Figure 2

Figure 2: After creating neovagina



Figure 3

Figure 3: Vaginal mould with graft



Figure 4

Figure 4: Vaginal agenesis postoperative



VAGINAL MOULD

We have used a simple, inexpensive, easy to make soft mould for vaginoplasty. This vaginal mould was prepared by taking a 12 cm width sponge rolled over a 14/16 G red rubber catheter to produce a length of 12 cm and diameter of

5 cm. The flower end of the red rubber catheter was cut with 3 additional holes made on the side. The sponge was secured over the malecot by 2-0 silk. This was covered over by condoms and the lower end was secured by the 2-0 silk, making it airtight. This mould is designed for evacuation of air and can collapse to about one-fourth of its original size. Among the advantages of this mould are simplicity, comfort, ease of placement and removal, low-cost, easy maintenance and preparation from readily available materials. (Figure 3)

RESULTS

The final results were excellent in six cases with complete graft take, satisfactory dimensions of the neovagina and no stenosis or fistulas. One case reported with partial vaginal stenosis which was corrected by regular dilatation with the mould. (Table I)

None of the seven patients had any significant post-operative complications. (Table II) Two patients however had minimal bleeding during mould insertion after 2 weeks which subsided with the conservative management. All the seven patients came for regular follow-up, ranging from 4 months to 2 years. All patients who underwent McIndoe Vaginoplasty were compliant with postoperative vaginal mould use. Clinical examination performed postoperatively revealed neovagina of adequate length and calibre. None of the patients except one had partial vaginal stenosis and surgical results were gratifying for them. The psychological outcome was also very encouraging. Four patients who came for follow-up after the marriage reported satisfactory sexual relationships and were satisfied with the vaginal depth.

Figure 5

Table 1: Outcome

Results	No. of cases
Excellent (90-100 % graft take)	6
Good (75-90%)	1
Poor(less then 75%)	-

Figure 6

Table 2: Complications

Complications	No. of cases
Bleeding	2
Infection	nil
Rectal Perforation	nil
Recto-vaginal fistula	nil
Uretro-vaginal fistula	nil
Vaginal Stenosis	1

DISCUSSION

Vaginal agenesis is a rare anomaly but give rise to serious problems for the sexual life of the otherwise normal patient.

Vaginal agenesis is associated most commonly with Mayer-Rokitansky -Küster-Hauser (MRKH) syndrome. Hauser and Schreiner in 1961 first described the Mayer- Rokitansky - Küster-Hauser syndrome after reviewing the autopsy reports described by Mayer in 1829, Rokitansky in 1838 and Kuster in 1910.⁵

More than 90% of patients of vaginal agenesis fulfill the criteria for the MRKH syndrome, which comprises of 46, XX karyotype with normal, functioning ovaries with absent or hypoplastic uterus. The remaining patients have a more unusual genetic abnormality and fulfill the criteria for testicular feminization .These patients are 46, XY and have some testicular tissue.

The surgical management of vaginal agenesis constitutes a significant reconstructive challenge for the surgeons, the outcome of which affects both the physical and psychological health of the patients.⁶

From historical perspective, a variety of non surgical as well as surgical procedures to correct vaginal agenesis have been described. The Frank's technique involves sequential dilatation of the vaginal remnant.⁶ The Frank's method is non-surgical however its success has proven variable and unpredictable.⁷ The patient needs to be highly motivated and willing to continue long term dilatation. However, awkward positioning and tediousness, possibility of vaginal prolapse,

stenosis and eversion are the major drawbacks of this method .⁸

There are various methods for surgically constructing neovaginas and the difference among the various surgical approaches lies in the tissues used to line the neovagina. The various techniques described are Abbe–McIndoe, McIndoe and Bannister procedure,^{9,10} constructing neovagina from bowel segments,^{11,12,13} pudendal-thigh flaps,¹⁴ fasciocutaneous flaps,¹⁵ gracilis myocutaneous flaps,¹⁶ labia minora flaps,¹⁷ flaps raised following tissue expansion of the labial pocket,¹⁸ peritoneum and bladder mucosa^{19,20}, amnion,^{7,21}, the interceed absorbable adhesion barrier²² and autologous buccal mucosa graft. ^{23, 24}

The amnion is often used as a homograft without rejection but often difficult to procure and prepare and has an added risk of donor–patient viral infection hence it has not gained wide acceptance.

The reconstruction with flaps involves technically complex techniques. Musculocutaneous flaps are sturdy and the gracilis and rectus being the most commonly used muscles. These flaps are sensate but bulky and hairy and require larger dissection to create an adequate space between rectum and the bladder.²⁵ This bulk is quite often helpful in vaginal reconstruction after radical operations for cancer or after irradiation,^{2, 26} but are not the procedure of choice in patients with MRKH syndrome ²⁷ .The failure rate of gracilis flap is high because of tenuous vascularity of the flaps¹⁶. In pudendal flaps problem is of dehiscence, infection and drainage.

In vulvovaginoplasty, tissue expanders are used to expand skin of labia minora and medial skin and subsequently skin flaps with posterior pedicle is raised for creating a pouch ²⁸ .However major drawback is scarring of labia majora and minora, distortion of the vulva, hospitalization for two months, necessity of two operations, long confinement to bed and increased risk of infection.

Vecchiattis method and modifications of similar laparoscopic procedure are complicated and technically demanding ^{29, 30} .All these techniques are associated with discomfort and requires a long period for adequate results.

Bowel vaginoplasty utilizing sigmoid colon offers some advantages over skin grafts because of distensibility and self lubricating property with no tendency for neovagina stenosis but has the drawbacks of a laparotomy with visible scars,

possibility of bowel leakage/obstruction and problem of mucous secretion.^{31, 32}

Autologous buccal mucosa has also been attempted as graft material encouraging results obtained for neovaginoplasty in few studies.^{24, 33} However these studies comprised of limited number of patients with no long term follow-ups.

The patients reviewed in our study were all treated with modified McIndoe technique.^{9, 10} Our aim was to create a functionally and cosmetically normal neovagina using the simplest available technique.

Out of the many different approaches available for vaginal reconstruction, the technique proposed by McIndoe has remained till now the most popular and the safest technique for treatment of vaginal agenesis. In McIndoe operation, split-thickness skin grafts are used to line the neovagina. The main advantage is its simplicity and low morbidity. The disadvantages are tendency of the graft to contract, fistula formation and need for the lubrication. Creation of a neovagina often requires long-term use of vaginal retainers to avoid stenosis. A full-thickness graft has less tendency to contract but transfers undesirable epithelial appendages hence not preferable.

In our study there were no major complications, however intra and post op complications of this procedure are well known.³⁴ Complications often encountered during McIndoe technique are failure of skin graft take, bleeding, urethrovaginal fistula, perforation of the rectum, rectovaginal fistula and vaginal stricture. However if a surgeon is careful, slow in dissection serious complications are few and the final result is good.

Scarring associated with donor site is usually hidden and that also improves with time. The grafted skin often transform and develops many of the characteristics of normal vaginal mucosa after some time.³⁵ Several authors have documented satisfactory sexual relationships using McIndoes method in over 75 % of the patients.^{2, 3, 8} In our study also, all married patients reported satisfactory sexual relationship after this technique.

Though many studies have reported lack of optimal graft take but in our study graft take was more than 90 %, as also in Buss and Lee study.⁸ We attribute this to our technique and improvised vaginal mould. We find that role of vaginal mould is of prime importance in graft take and ultimate outcome.

McIndoe procedure is simple and the results are reproducible and hence despite the existence of several alternatives today, McIndoe technique is also the preferred choice of many authors with satisfactory results.^{2,3,5,8, 36,37,38,39}

In our experience also we found that vaginoplasty by McIndoe technique is successful, safe with satisfactory long term results. We find that this technique is extremely simple and good, complications are few and manageable. The final result is good with vagina of satisfy dimension. However we would like to emphasize on careful dissection in the plane of cleavage, absolute haemostasis and correct use of mould esp. during periods of sexual inactivity to attain optimal result.

CORRESPONDENCE TO

Dr.Sanjay Saraf Department of Plastic Surgery NMC
Specialty Hospital Dubai, UAE E-mail:
drsaraf@hotmail.com

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Author Information

Sanjay Saraf, MS, MCh. (Plastic Surgery), DNB (Plastic Surgery), MNAMS
Specialist Plastic Surgeon, Department of Plastic Surgery, NMC Specialty Hospital

Praveena Saraf, MS (Gyn/Obs)
Specialist Gynecologist, Department of Plastic Surgery, NMC Specialty Hospital