

Vaginal Reconstruction with Pudendal Thigh Flap- an early experience in Shaheed Sohrawardi Medical College Hospital

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Abstract:

The surgical management of the absence of the vagina is a complex problem and constitutes a significant technical challenge. The aim is to create a neovagina that is satisfactory both functionally and aesthetically using a technique that is simple, reliable, and applicable to most patients. Earlier techniques used were skin grafts, or local skin flaps with various degrees of success. Tissue expanders and vascularized flaps like gracilis myocutaneous flaps were used for more extensive reconstruction. In 1989 Wee and Joseph introduced a new technique using bilateral pudendal thigh flaps based on post labial artery; a branch of perineal artery, which itself is the continuation of the internal pudendal artery. A 16 year old girl with congenital vaginal stenosis in whom previous two attempts of vaginal recanalization have failed, a neovagina was created using the bilateral pudendal thigh flaps, the lining of the cavity was made by the fasciocutaneous flap with the blood supply from the posterior labial artery, a branch of perineal artery. There was no per-operative or post operative complications. Follow-up shows no significant contractions, the reconstructed vagina is expansible and post operative stenting or dilatation was not required. There is good sensation in the wall of the constructed vagina because sensory nerves run through the flaps.

Key words: Vaginal stenosis, Neo-vagina, Pudendal Thigh Flaps.

Introduction:

Reconstruction of the vagina is indicated in children with congenital disorders presenting with abnormal genitalia and in adult after ablative surgery for malignant disease.¹ The aim is to create a neovagina that is satisfactory both functionally and in appearance using a technique which is simple, reliable, and applicable to most of the patient.¹ Mayer - Rokitansky - Kuster - Hauser (MRKH) syndrome consists of vaginal aplasia with or without other müllerian (ie, paramesonephric) duct abnormalities.² Its penetrance varies, as does the involvement of other organ systems.

The typical form of MRKH syndrome represents a developmental deficiency of the müllerian ductal system consisting of absence of both uterus

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and vagina. Isolated absence of the proximal two thirds of the vagina with functional uterus occur infrequently.¹ Patients with this syndrome have a normal female karyotype. They typically present at the age of menarche or later because of primary amenorrhoea⁴. Rarely the abnormality is discovered at birth. On physical examination, findings include a normal vulva with absent vagina or vagina represented by a dimple. The ovaries are normal and there is normal cyclical ovarian function as reflected by circulating hormone levels and ovulation and the fallopian tubes may or may not be normal but complete absence is rare.⁴ Although this condition has psychologically devastating consequences, its anatomical defects can be surgically reconstructed. Following diagnosis, surgical intervention allows patients to have normal sexual function. Reproduction may be possible with assisted techniques.⁷ There are many surgical techniques for reconstruction of congenital absence of the vagina. The basic step in all methods is the creation of a pocket between urinary bladder and rectum. The lining of this cavity differs in each technique⁵ ranging from simple procedures involving the application of split-thickness skin grafts to very complicated procedures in which large segments of skin and underlying tissue, including muscle, are used as flaps to cover gaping defects.⁶ The technique of

vaginal reconstruction depends on the length of the remaining vagina, the viability of the tissue, and the accompanying deficit as a result of the treatment method.⁶ In 1989, Wee and Joseph⁸ described a new technique of vaginoplasty using bilateral pudendal thigh flaps, the base of which is designed horizontally at the level of the posterior margin of the introitus. Placed adjacent to the outer border of the labia majora, it extends towards the femoral triangle in a conical fashion centered on the inguinal crease.¹ The internal pudendal artery gives out two terminal branches: the penile or clitoral branch and the perineal artery. The perineal artery supplies the labia/scrotal part of the perineum by terminal branches that anastomose with their counterparts from the opposite side. The other branches of the perineal artery are medial and lateral branches. The medial branch supplies the perianal region and the lateral branch supplies an area of the posterior surface of the upper thigh.⁹ All these branches anastomose with a counterpart from the opposite side and also with the deep external pudendal, circumflex femoral and anterior branch of the obturator artery¹ and hence form a rich vascular anastomosis around the orifice. This vascular network provides the basis of our perforator flaps.⁹ The posterior labial branches of the pudendal nerves and twigs from the perineal branch of the posterior cutaneous nerve of the thigh provides the innervations of the flap.¹

Patient & Method:

A 16 years old girl consulted in the gynaecological department with the complaint of primary amenorrhoea with a dimple in the introitus (fig-1 & 2) which allowed only the tip of the little finger but ultrasonography of the abdomen showed functional uterus and adnexa and all her other secondary sex characters were fully developed. She had history of two previous surgical intervention including laparotomy, which failed to solve her problem.

Surgical Technique

Under general anaesthesia the patient was placed in the lithotomy position with the legs on stirrups and urinary bladder was catheterized. Broad



Fig -1: Vaginal orifice showing only a dimple.

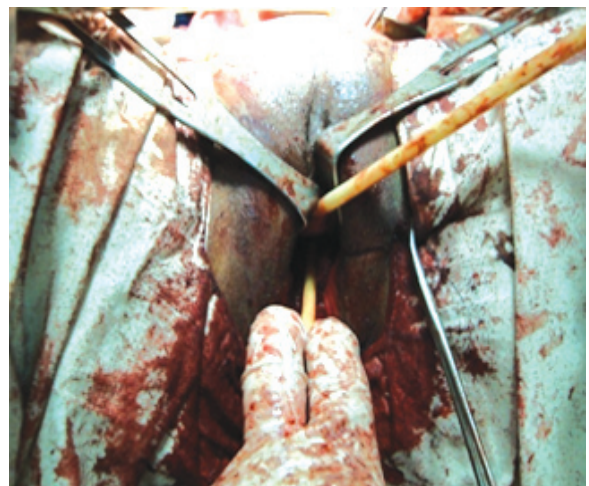


Fig -2: After recanalization of vagina.

spectrum antibiotics were given. After designing the flaps on both sides of the proposed vagina, surgeon started the procedure to perform the recanalization of the neo-vagina. The dissection was very meticulous and proceeded in between the urethra and urinary bladder anteriorly and rectum posteriorly. Adequate care was taken not to injure these vital structures during dissection.

M shaped bilateral pudendal-thigh flaps were raised. The flap was marked with a length x breadth 12x 5cm, base at the level of introitus extending from lateral to hair bearing part of labia majora across groin crease to medial thigh (fig.-3). It is arterialized throughout by the posterior labial artery and deep external pudendal arteries.

The tendon of the adductor longus muscle was identified and flap elevation started at the apex.

(Fig.-4) The incisions made along the margins except posteriorly and carried down to include the epimysium of the adductor muscle. (Fig.-5). Elevation of the flaps was carried out in this plane



Fig -3:Surface marking of the flap.



Fig -4: Raising of the flap from apex.

until the base was reached. The deep fascia was tacked to the edges to prevent shearing (fig.-6).

The skin at the base of the flap is incised to the sub-cutaneous tissue level and is undermined in this plane posteriorly for a short distance (Fig-7 & 8). This allows rotation of the flap medially and brings the posterior margin next to the inner edge of the labia to which it will be sutured. The labia were lifted off the pubic rami and perineal membranes and flaps from both sides were tunneled under labia. (Fig.-9) This was safe for the posterior labial nerves as they had entered the



Fig -5: Raising up to the epimysium of the muscle.

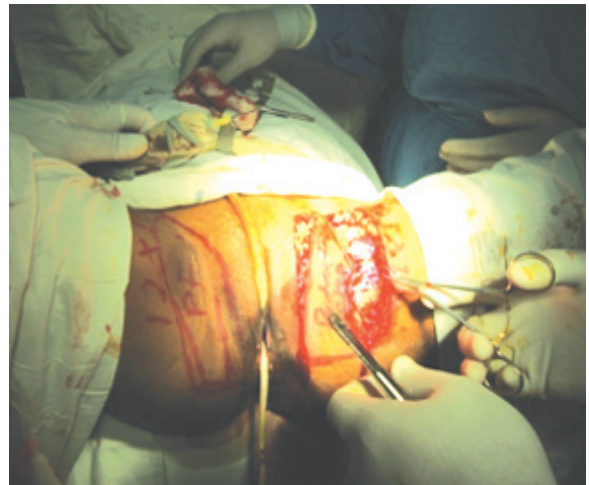


Fig -6: Tucking of deep fascia to skin.

labial fat far posteriorly. Clitoral nerves were also in no danger because they do not pass through the superficial perineal pouch and course through the deep perineal pouch to reach the clitoris.

Flaps from both sides, tunneled under the labia majora were everted through introitus (Fig.-10) so both come to lie together in the middle without tension.(Fig.-11) Posterior suture line was completed first and after the tip was reached then anterior suture line was commenced. The tip of cul-de-sac was then invaginated and simply anchored to the tissue at the upper part of the vaginal space. The opening of the neo-vagina was sutured to the muco-cutaneous edge of labia minora. Donor site was closed primarily without tension (Fig - 12, 13 & 14).

Post operatively the patient was kept in bed

for 48 hours. Urinary and cervical catheter was maintained for 3 weeks, the vaginal canal was washed with normal saline every day and parenteral broad spectrum antibiotics given for 5 days.



Fig -7: Subcutaneous dissection of the pedicle.



Fig -8: Raised flap.

Result:

The post operative period was uneventful. The flap survived completely (Fig-15) and pervaginal examination revealed a satisfactorily wide vaginal canal (about two fingers could be introduced) with intact sensation. The patient started menstruating about 1 month after operation.

Discussion:

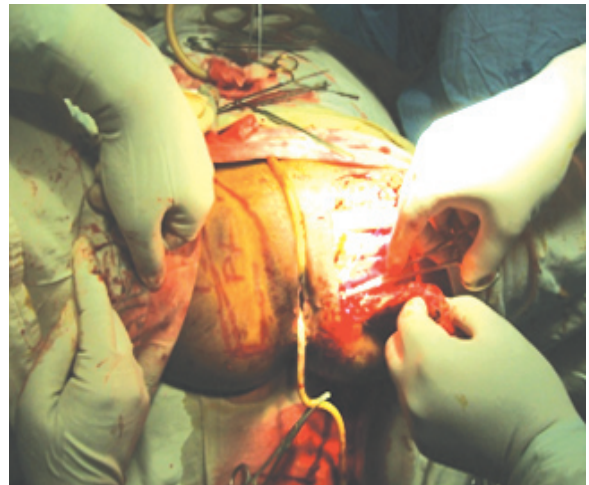


Fig -9: Making a tunnel through Labia .

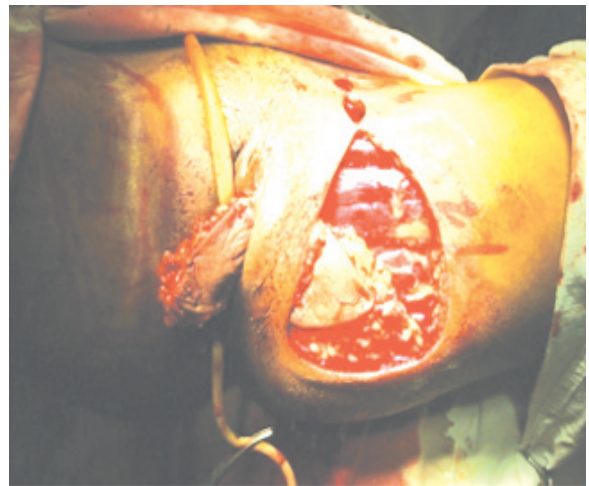


Fig -10 : Bringing the flap through the tunnel.

The incidence rate of MRHK syndrome is 1:5000 female birth.³ The surgical management of the absence of the vagina is a complex problem and constitutes a significant technical challenge.⁶ Vaginal reconstruction is critical for maintenance of sexual functioning, psychosocial health, restoration of body image, and for pelvic support to prevent bladder, rectal, and pelvic prolapse.⁶ There are many methods of vaginal reconstruction with their own advantages and disadvantages. They include the serial dilatation¹⁰, use of split skin graft¹¹, use of full thickness graft¹², use of buccal mucosal graft¹³ and use of amniotic membrane¹⁴, Ileum and pelvic colon.^{15,16} Gracilis¹⁷ myocutaneous and Groin fasciocutaneous¹⁸ flaps have also been used. Serial dilatation is a non-operative technique and

has no morbidity but it requires long extended duration of stent use to be effective. Use of split skin graft (SSG) or McIndoe technique is the gold standard by which all other techniques

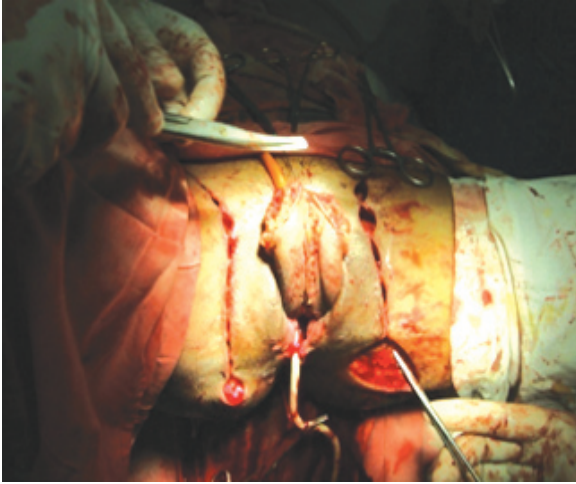


Fig -11: Both flaps sutured in the midline



Fig -12 : Sutured internal surface.

are compared. It is a simple procedure and easy to perform and carries less morbidity. Good vaginal length is easy to obtain. Disadvantage of this technique is the shrinkage of the cavity in due course of time because of contraction of the skin graft and the patient has to wear some type of a stent at all times. Use of full thickness graft (FTG) instead of split skin graft was done in order to prevent contraction of the graft, but it carries greater morbidity and the necessity of wearing the stent is still there. Use of amniotic membrane to line the cavity instead of SSG or

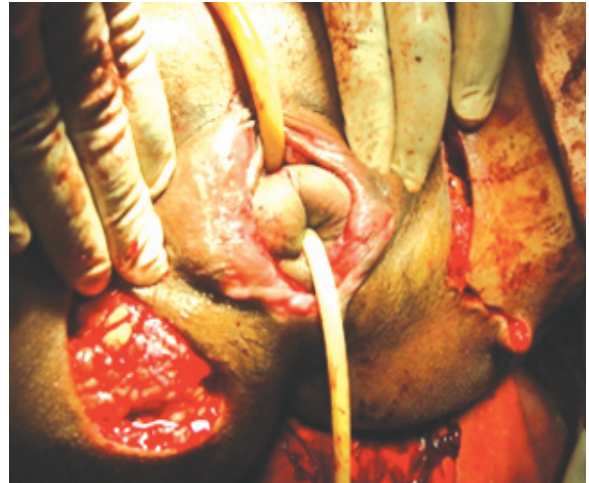


Fig -13 : Flap transpositioned in vaginal cavity.



Fig -14 : Immediate post operative picture.



Fig -15 : Post operative picture after 3 weeks.

FTG has been used but remains far away from the ideal solution as amniotic membrane never takes but acts as a biological dressing that helps in accelerating the wound healing and also requires wearing a stent. As Baldwin procedure, which popularized the use of the various portions of the bowel such as Ileum and colon to reconstruct the vagina, bears increased mortality and morbidity associated with intra abdominal surgery, along with other disadvantages associated with the use of ileum included bleeding with coital trauma, excessive mucous secretion, periumbilical pain associated with coitus and tendency to prolapse. Baldwin procedure is generally abandoned in favor of the other safer operations. Gracilis myocutaneous flap became very popular for perineal reconstruction. But it carries a pedicle, which is very precarious, and chances of flap failure are quite high especially for a surgeon in his early learning curve. Furthermore it produces a very conspicuous thigh scar. Comparing the above problems, the pudendal thigh flap is a sensate fasciocutaneous flap based on the terminal branches of the superficial perineal artery, which is a continuation of the internal pudendal artery. It looks to be very ideal, as it has got a robust blood supply and chances of necrosis are almost negligible. The technique is simple, safe, and reliable, and no stents or dilators are required.¹⁹ The reconstructed vagina has a natural angle and is sensate retaining the same innervation of the erogenous zones of perineum and upper thigh.¹ The donor site in the groin can be closed primarily with an inconspicuous scar well hidden in the groin crease.¹⁸ There are certain disadvantages with this Pudendal thigh flap. It is technically slightly more difficult than McIndoe technique and requires more time.¹⁹ The problems of hair in the neo-vagina can be dealt by depilatory creams or by Laser therapy.²⁰ In some cases there is numbness of the vagina. This is because the anterior part of the flap near the medial corner of the femoral triangle is supplied by the nerve twigs of genitofemoral and ileoinguinal nerves which are cut in the process of elevation, hence sensation is retained only in the lower part of reconstructed vagina.

The distinct advantages of this flap widen its indications to several other pathologies. In one study¹⁹ the authors report on the bilateral use of the flap to reconstruct a vagina in patients with congenital atresia, and after oncological resection. Furthermore, the versatility of this island flap is also demonstrated by its use in a unilateral fashion in patients with recurrent or complex rectovaginal fistulas and in two patients with a defect of the posterior urethra in a heavily scarred perineum.¹⁹

Conclusion

It is an established fact that McIndoe technique is a simple procedure with less morbidity and more comfort, but Pudendal thigh flap would be a useful addition to the armamentarium of the plastic surgeon for constructing the vagina. Bilateral fasciocutaneous pudendal thigh flaps permit vaginal reconstruction and an uterovaginal connection in patients with vaginal agenesis and a functional uterus. The main advantages of this technique are; this is a one- stage operation, the flap is sensate, neovagina is both anatomically and functionally spacious and linear scar is hidden in the donor site.

This is our early experience with reconstructed vagina, better conclusion can be drawn with a longer follow-up in near future.

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