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The Use of Bilateral Pudendal Thigh Flap for Primary and Secondary Vaginal Reconstruction

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ABSTRACT

Vaginal reconstruction is usually needed for females with primary vaginal agenesis, individuals with complete androgen insensitivity syndrome CAIS **[1]**, as well as patients with secondary causes who had pronounced stenosis of the vagina after vaginal reconstruction for various causes.

There are various methods for surgically constructing a neovagina in which a tunnel is opened in the potential space between the urethra and rectum, and then lined to prevent its obliteration, and the difference among the various surgical approaches lies in the tissues used to line the neovagina.

In this case series 16 patients, were managed with 31 Pudendal Thigh Flaps, 14 patients required primary vaginal reconstruction, while two required secondary vaginoplasty. All primary patients presented with total absence of upper part of the vagina cranial to the hymen, while secondary cases were following inadequate primary reconstruction using McIndoe technique.

Age ranged between 13 years and 31 years with a mean of 20.75±4.083. Eight patients out of 16 were married, 2 were divorced, one was married but unwed, and the remaining 5 patients were singles.

The aim for this study is to assess the feasibility and difficulties encountered when embarking on such endeavor.

INTRODUCTION

Vaginal reconstruction is usually needed for females with primary vaginal agenesis, individuals with complete androgen insensitivity syndrome CAIS **[1]**, as well as patients with secondary causes who had pronounced stenosis of the vagina after vaginal reconstruction for various causes **[2]**. 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 **[3]**. Vaginal agenesis is most commonly associated with Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome which is described as congenital vaginal agenesis in an individual with normal female genotype, phenotype and normal endocrine status **[4,5]**.

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 using dilators **[6]**. The Vecchietti procedure, in which a small plastic "olive" is threaded against the vaginal dimple, and the threads are drawn through the vaginal mucosa, up through the abdomen and through the navel using laparoscope; then the threads are attached to a traction device **[7,8]**.

There are various methods for surgically constructing a neovagina in which a tunnel is opened in the potential space between the urethra and rectum, and then lined to prevent its obliteration, and the difference among the various surgical approaches lies in the tissues used to line the neovagina.

The various techniques described include Abbe-McIndoe procedure using skin grafts **[9,10]**, constructing neovagina from bowel segments **[11,12]**, gracilismyocutaneous flaps **[13]**, labia minora flaps **[14]**, and pudendal-thigh flaps **[15]**.

Bilateral pudendal thigh flaps (PTF) which are based on posterior labial artery, a branch of internal pudendal artery, **[3]** were described as one of the relatively newer flaps to increase the armamentarium of plastic surgeons for the reconstruction of the vagina **[16]**.

This flap was used in published series with only minor postoperative problems and with good anatomical and functional results **[15,16]**.

Aim of the work:

To assess the early and long term results and complications using pudendal thigh flaps technique in both primary and secondary vaginoplasties.

PATIENTS AND METHODS

In this series 16 patients, were managed with 31 PTF.

Age ranged between 13 years and 31 years with a mean of 20.75±4.083. Eight patients out of 16 were married, 2 were divorced, one was married but unwed, and the remaining 5 patients were singles.

All cases were recognized socially and legally as females as documented by their National identification papers, and birth certificates, except for three cases in whom only birth certificates were available as they were under 16 years of age.

Only 2 patients were cases of total androgen insensitivity syndrome, in whom the patients were socially and legally identified as females and were too old, and unwilling to have sexual reassignment surgery into males, while all the remaining 14 cases were females with Müllerian duct agenesis (MRKH) syndrome.

In all but one case two symmetrical flaps were designed along the groin crease just lateral to the hair bearing skin of the labia, with a breadth of 4-5cm, and extending anteriorly as far as the femoral triangle while ending posteriorly just opposite a point between the posterior end of theintroitus and anus (Fig. 1a).

General anaesthesia or spinal analgesia with sedation were used, and after putting the patient in lithotomy position an indwelling urethral catheter was inserted, and retraction sutures were taken (Fig. 1b).

After infiltration with 1:80 000 diluted adrenaline solution the vaginal dimple was opened in an inverted U fashion, and the pelvic floor muscles were cut to gain access to the space between the urethra anteriorly and the rectum posteriorly, blunt dissection was continued to dilate this potential space upward till reaching Douglas pouch (Fig. 2a,b).

Bilateral pudendal thigh flaps were raised in the classical method as described by Wee **[15]**, as an island flap based posteriorly on a leech of connective tissue containing the branches of the posterior labial artery, taking care to include the deep fascia and epimysium of the pelvic floor muscle into the middle third of the flap (Fig. 3).

Flaps were then transposed medially beneath a tunnel made under the labia majora (Figs. 4,5), and after marking the part of the flap that will lie in the tunnel under the labia; de-epithelialisation of this part was performed (Fig. 6).

The flaps were sutured facing each other using Vicryl 3/0 sutures, to form a skin-lined cul-de-sac that is inserted in the previously formed vaginal space (Fig. 7a,b).

Two sutures of heavy Vicryl were used to anchor the newly formed vagina to the upper part of the sides of the newly formed space to avoid vaginal prolapse.

A small sized, custom-made, retainer was then inserted in the newly formed vagina, and an indwelling urinary catheter and both are kept in place for 72 hours after surgery as the patient is kept in bed for a similar time.

Patients were instructed on frequent dilatation by artificial dilators daily, Intercourse was permitted after 8-12 weeks.

RESULTS

In this study thirty one flaps were performed for 16 patients. 14 patients required primary vaginal reconstruction, while two required secondary vaginoplasty. All primary patients presented with total absence of upper part of the vagina cranial to the hymen.

While secondary cases were following inadequate primary reconstruction using McIndoe technique.

Age of our patients ranged between 13 years and 31 years. Eight patients out of 16 were married, 2 were divorced, one was married but unwed, and the remaining 5 patients were singles.

Our operative time ranged between 4 hours and 5.5 hours with a mean of 4.6h±0.473, and the hospital stay ranged between 3 and 7 days postoperatively.

Not a single case of total flap loss occurred, however, in 3 patients partial flap necrosis was observed. In two of them this was managed conservatively by prolonged dressing and using a lubricated retainer, and in one patient a second operation was needed in the form of split thickness skin grafting, to recreate the proximal part of the vagina.

In one patient flap dehiscence occurred, the flap got partially prolapsed and had to be re-sutured in place (Fig. 9a-d).

Partial donor wound dehiscence was seen in 4 patients, and it was managed conservatively in all patients.

Hair growth was noticed in few of our early cases, and Laserhair epilation was done in 2 cases post-operatively.

All patients assured the presence of tactile and erotic sensation in the newly formed vagina, and tactile sensations were confirmed by examination.

Fig. (1A): Flaps design.

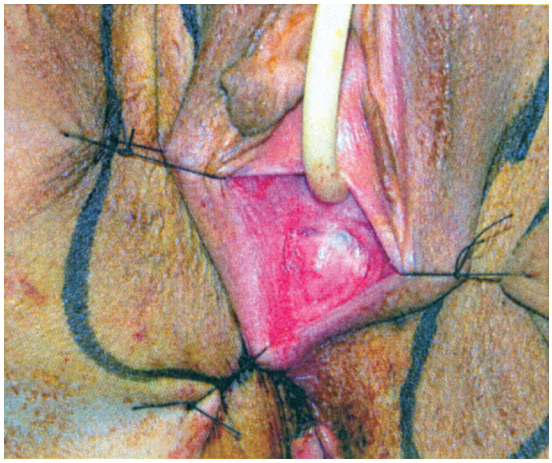

Fig. (1B): Indwelling urinary catheter and retraction sutures in place.

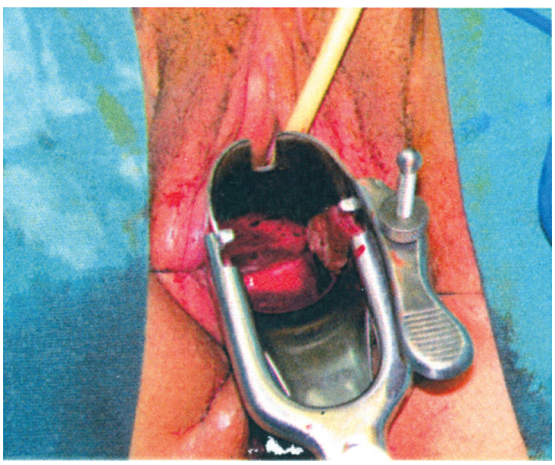

Fig. (2A): Cusco's speculum inserted into the potential space opened between urethera and rectum.

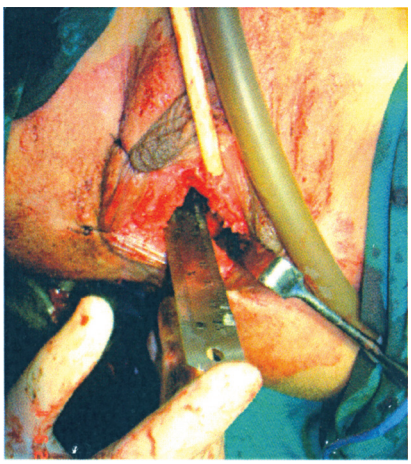

Fig. (2B): A ruler inserted into the potential vaginal space to show its depth.

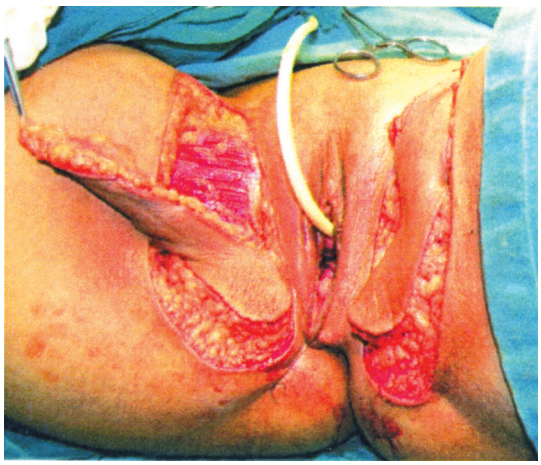

Fig. (3): Pudendal thigh flaps are bilaterally raised.

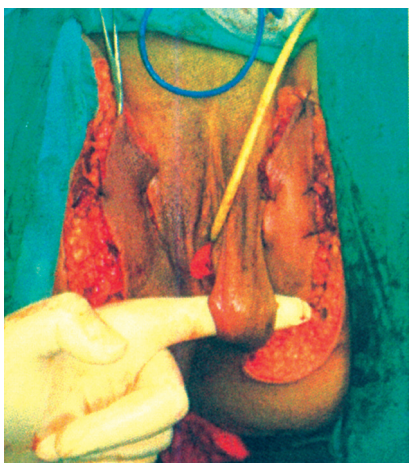

Fig. (4): Tunnel under the labia majora is created to allow the transfer of flaps into the pouch.

Fig. (5): Flaps are moved under the labia medially.

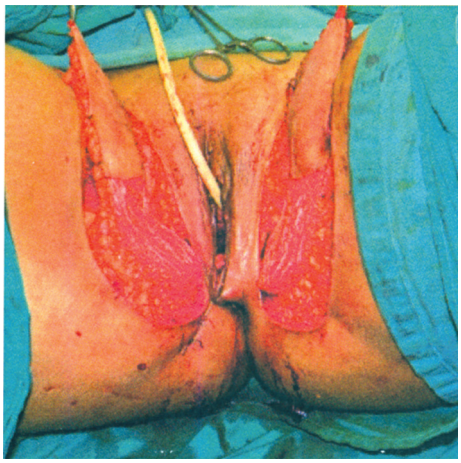

Fig. (6): The portion of the flaps that will lie under the labia is de-epithelialised.

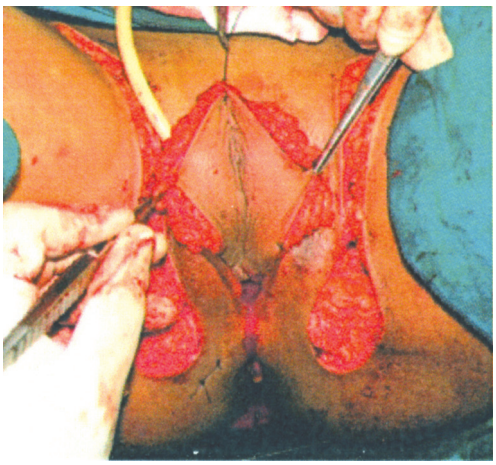

Fig. (7A): Flaps are sutured facing each other.

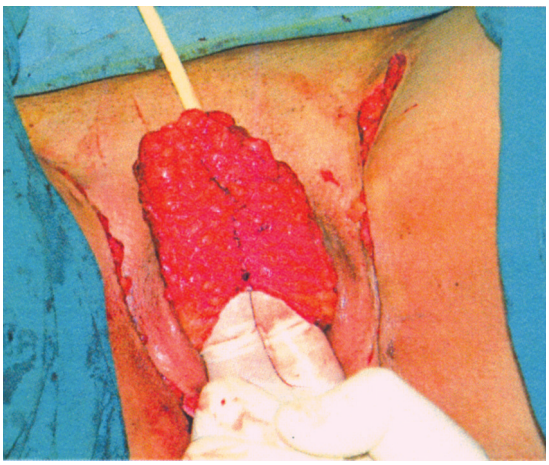

Fig. (7B): Flap suturing is complete forming a skin lined pouch that will represent the vagina.

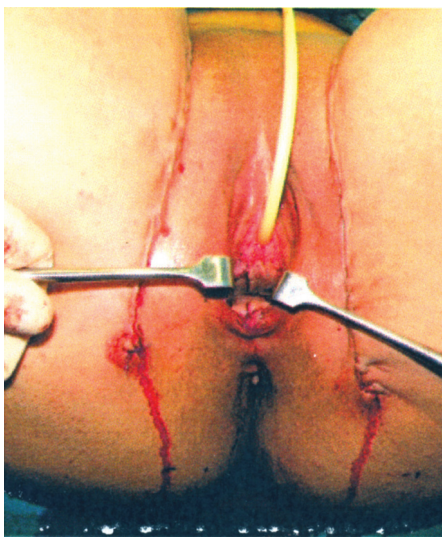

Fig. (8A): Skin flaps are inserted in the vaginal space.

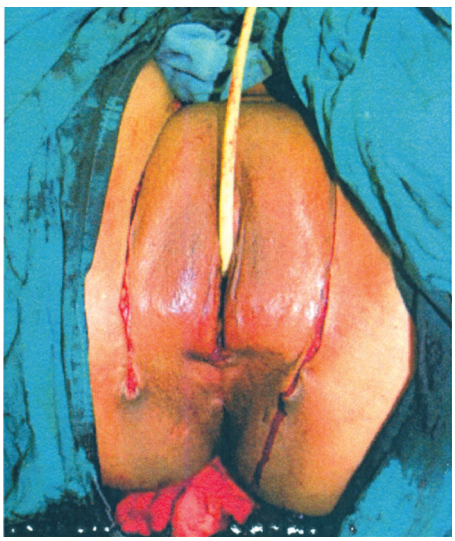

Fig. (8B): Perineal appearance by the end of the procedure.

Fig. (9A): Right side flap prolapse.

Fig. (9B): Flap is re-sutured in place.

Fig. (9C): Appearance of perineum after flap reposition.

Fig. (9D): Flaps in position after reposition.

DISCUSSION

Although the use of various techniques has been reported in the reconstruction of the vagina **[6-15]**, Abbe-McIndoe technique in which a tunnel is opened between the urethera anteriorly and the rectum posteriorly then this tunnel is lined by skin graft harvested from the thigh and wrapped around a mould inserted into the tunnel remains the most widely used and practiced for vaginal reconstruction in cases of vaginal agenesis **[17-21]**.

Any surgeon who had real experience with the McIndoe technique is quiet acquainted with the difficulties inherent to the procedure, adequate hemostasis in the vaginal tunnel needed for good graft take is almost impossible to achieve, the early period of dressing is very inconvenient to both surgeon and patient, the overall take of graft is rarely satisfactory and, second grafting is frequently needed, the prolonged use of an oversized mould is very cumbersome and socially inconvenient to the patient, and even after all of this strictures are common, graft is insensate and dry and intercourse is almost impossible without external lubrication. The donor morbidity to the thigh is rather marked especially in our darker patients.

Our awareness of these drawbacks has encouraged us to shift to the more recently described bilateral pudendal thigh flaps to achieve our goal in vaginal reconstruction.

The procedure is technically simple, the operative time is not much longer than we used to spend in McIndoe procedure, the post operative dressing and follow-up is shorter and simpler and the need for using a mould is much less. The end result is far superior as regard incidence of stricture, sensation and donor morbidity.

The complications met, using this procedure, were rather minor, and easily dealt with. Donor wound dehiscence was the most commonly met complication, however those usually healed with dressing and they did not add much to the donor morbidity.

Distal flap necrosis, a complication that we were faced with more commonly in our earlier cases can be minimized by respecting the vascular

anatomy of the flap which was recently cleared by Tham and her colleagues [22], thus designing the flap posterior end more medially.

Though the flap originally described as a non hair bearing flap and care was taken to design the flap outside the hair bearing skin of the labia however hair growth was noted frequently and in later cases we resorted to pre-operative laser hair epilation to avoid this. Hence we advice Pre-operative laser hair epilation as an integral part of the technique.

This method of vaginoplasty has proved in our hands to be simple method with short operative time and postoperative follow-up the technique is reliable with minimal complications, and with satisfactory functional and cosmetic results that is superior to the more customarily used technique of McIndoe vaginoplasty.

REFERENCES

1- Quigley C.A., De Bellis A., Marschke K.B., El-Awady M.K., Wilson E.M. and French F.S.: Androgen receptor defects: Historical, clinical, and molecular perspectives. Endocr. Rev. June, 16 (3): 271-321, 1995.

2- Kurita M., Ozaki M., Okazaki M., Omori M., Takushima A. and Harii K.: Secondary reconstruction of vaginal stenosis with bilateral pudendal thigh flaps. Scand J. Plast. Reconstr. Surg. Hand Surg., Feb. 17, 2010.

3- Capraro V.J. and Gallego M.B.: Vaginal agenesis. Am. J. Obstet. Gynecol., 124: 98-107, 1976.

4- Hauser G.A. and Schreiner W.E.: Mayer-Rokitansky-Küster syndrome. Rudimentary solid bipartite uterus with solid vagina Schweiz Med. Wochenschr. Mar., 25 (91): 381-4, 1961.

5- Griffen J.E., Creighton E., Madden J.D., Harrod M.J. and Wilson J.D.: Congenital absence of the vagina: The Mayer-Rokitansky-Küster-Hauser syndrome. Ann. Intern. Med., 85: 224-236, 1976.

6- Frank R.T.: The formation of an artifical vagina without operation. Am. Obstet. Gynecol., 35: 1053-5, 1938.

7- Vecchietti G.: Creation of an artifical vagina in Rokitansky-Küster-Hauser syndrome (in Italian). Attual Obstet. Gynecol., 11 (2): 131-47, 1965. PMID 5319813.

8- Fedele L., Bianchi S., Tozzi L., Borruto F. and Vignali M.: A new laparoscopic procedure for creation of a neovagina in Mayer-Rokitansky-Küster-Hauser syndrome. Fertil Steril, 66 (5): 854-7, 1996, PMID 8893702.

9- McIndoe A.H. and Bannister J.B.: An operation for the cure of congenital absence of the vagina. J. Obstet. Gynaecol. Br. Emp., 45: 490-494, 1938.

10- McIndoe A.: The treatment of congenital absence and obliterative conditions of vagina. Br. J. Plast. Surg., 2: 254-67, 1950.

11- Burger R.A., Reedville H., Knapstein P.G., Friedberg V., Hohenfellner R.: Ileocecal vaginal construction. Am. J. Obstet. Gynecol., 161: 162-167, 1989.

12- Franz R.C.: Sigmoid colon vaginoplasty: A modified method. Br. J. Obstet. Gynecol., 103: 1148-1155, 1996.

13- Mc-Craw J.B., Massey F.M. and Shanklin K.D.: Vaginal reconstruction with gracilis myocutaneous flaps. Plast. Reconstr. Surg., 52: 176-83, 1976.

14- Flack C.E., Barraza M.A. and Stevens P.S.: Vaginoplasty: Combination therapy using labia minora flaps and Lucite dilators: A preliminary report. J. Urol., 150: 654-656, 1993.

15- Wee J.T. and Joseph V.T.: A new technique of vaginal reconstruction using neurovascular pudendal-thigh flaps: A preliminary report. Plast. Reconstr. Surg. Apr., 83 (4): 701-9, 1989.

16- Mohammad Ashraf Ganatra and Najeebur Rab Ansari: Pudendal thigh flap for congenital absence of vagina, J. Pak Med. Assoc. Apr., 55 (4): 143-5, 2005.

17- Ozek C., Gurler T., Alper M., et al.: Modified McIndoe procedure for vaginal agenesis, 43 (4): 393-6, 1999.

18- Robert C.P., Haber M.J. and Rock J.A.: Vaginal creation for mullerian agenesis Am. J. Obstet. Gynecol., 185 (6): 1349-52, 2001.

19- Akn S.: Experience with neovaginal construction using the full-thickness skin graft in vaginal agenesis. Ann., 52 (4): 391-6, 2004.

20- Keser A., Bozkurt N., Taner O.F., et al.: Treatment of vaginal agenesis with modified Abbe-McIndoe technique: Long-term follow-up in 22 patients. Eur. J. Obstet. Gynecol. Reprod Biol., 121 (1): 110-6, 2005.

21- Saraf S. and Saraf P.: McIndoe Vaginoplasty: Revisited. The Internet Journal of Gynecology and Obstetrics, Volume 6 Number 2, 2007.

22- Tham N.L.Y., Wei R.B., Warren M.R., et al.: The pudendal thigh flap for vaginal reconstruction: Optimising flap survival. Journal of Plastic, Reconstructive & Aesthetic Surgery, 63: 826-831, 2010.