

# NEOVAGINOPLASTY IN CONGENITALLY ABSENT VAGINA WITH BILATERAL PUDENDAL THIGH FASCIOCUTANEOUS FLAPS

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## ABSTRACT

**Background:** Vaginal agenesis repair technique expensive and demanding in terms of expertise. **Objective:** To evaluate functional and aesthetic outcome of vaginal reconstruction using pudendal-thigh fasciocutaneous flaps. **Methodology:** Our case series was conducted at departments of plastic surgery and Obstetrics & Gynecology, Sheikh Zayed Hospital, Rahim Yar Khan from 1<sup>st</sup> September 2012 to 31<sup>st</sup> August 2015. Vaginal reconstruction was done with bilateral island pudendal thigh flaps in 08 consecutive female patients with congenital absence of vagina. Each flap was raised just lateral to labia majora and then after passing under the labia majora both flaps were sutured together to form a neovaginal tube. This neovaginal tube was then inserted into a newly created space between the rectum and bladder. **Results:** Out of 8, three patients (37.5%) were diagnosed with Mayer Rokitansky Kauser Hauser Syndrome and 5 (62.5%) with isolated vaginal atresia. One patient (12.5%) developed necrosis of distal part of a unilateral flap followed by severe infection that was managed conservatively. The same patient also developed excessive hair growth in the neovagina. In rest of the seven patients all the flaps survived completely and the neovaginal length and width was adequate. The mean vaginal length was 9.5 cm and width was 3.8 cm one year post operatively. **Conclusion:** Neovaginoplasty using bilateral islanded pudendal-thigh flaps is suggested as one of the best methods of vaginoplasty. This technique is very simple and reliable and has shown satisfactory functional and cosmetic results. The neovagina was sensate and has a natural angle for intercourse. No postoperative stenting or dilatation was required. The donor site was closed primarily and the resulting scar was in the groin crease with little secondary deformity.

**Key Words:** Vaginoplasty, Vaginal reconstruction, Agenesis, Neovagina, Pudendal thigh flap

## INTRODUCTION

Vaginal agenesis is a rare congenital condition and may be an isolated anomaly, or as a part of more complex anomalies, Like Mayer Rokitansky Kauser Hauser (MRKH) syndrome.<sup>1</sup> Its incidence approximates 1 in 4,000 to 10,000 female live births.<sup>1,2</sup> It is characterised by congenital aplasia of the uterus and the upper part (2/3) of the vagina in women showing normal development of secondary sexual characteristics and a normal 46, XX karyotype. The normal length of the posterior vaginal wall in adult female is 9 to 11 cm.

Vaginal agenesis typically results in a dimple or a small pouch approximately 1-4 cm in length in place of vagina and normal appearing external genitalia. Functional ovaries are however usually present so that the affected woman experiences pubertal growth and development and ovulation.<sup>3</sup> The patients with vaginal agenesis present either with primary amenorrhea, periodic abdominal pain or inability to have intercourse. The condition of vaginal agenesis carries a serious sexual, psychological, and even social burden.<sup>4</sup> The goals of vaginal reconstruction are to provide a normal looking vaginal opening, a passage for normal menstruation, and also to facilitate pain free, enjoyable sexual intercourse.<sup>5</sup>

There are many different surgical and non-surgical techniques described over the years for the formation of a neovagina,<sup>6</sup> e.g., Frank-pressure technique,<sup>7</sup> McIndoe technique of split thickness skin graft,<sup>8</sup> Horton's vaginoplasty using full thickness skin graft,<sup>9</sup> muscle flaps,<sup>10</sup> bowel flaps,<sup>11</sup> and more recently the pudendal thigh fasciocutaneous flaps.<sup>12</sup> The objective of this study was to evaluate the functional and aesthetic results of neovaginoplasty using bilateral pudendal thigh flaps in patients with vaginal atresia.

## METHODOLOGY

This case series was carried out in the Departments of Plastic Surgery and Obstetrics & Gynecology at Sheikh Zayed Hospital, Rahim Yar Khan. In eight consecutive patients with vaginal aplasia and a neovagina was reconstructed with bilateral pudendal thigh flaps during 3 years from 1<sup>st</sup> September 2012 to 31<sup>st</sup> August 2015. Seven patients were referred by gynecologists and one from surgery department. This patient from surgery ward was married and presented with rectocutaneous fistula as there was no vaginal passage. She had undergone colostomy and repair of fistula before neovaginoplasty. A detailed history was taken, complete physical examination carried out and findings recorded.

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Abdominal and pelvic ultrasound was carried out for all patients preoperatively. All patients had a preoperative evaluation under anesthesia and the abnormalities recorded accurately. In all patients uterus was either absent or rudimentary in nature. Patients were admitted a day before surgery and enema given at night to clear the rectum. Pre-induction broad spectrum antibiotics were given.

### **Surgical technique:**

The patients, after giving general anesthesia, were placed in a lithotomy position and catheterized. Lignocaine 2% with adrenaline 1:100,000 was injected in the space between the rectum and urethra. A role of gauze was packed in the rectum to avoid its injury. A transverse incision was made in the vestibular mucosa over the region of the dimple and a wide cavity was created by means of sharp and blunt digital dissection between the bladder and rectum. Hemostasis was obtained with the use of electrocautery and adrenaline soaked gauze packing. Pudendal thigh flaps were marked on both sides of labia majora keeping the groin creases in the centre of the flap. Each flap was triangular or horn shaped measuring 13 to 15 cm in length and 5 to 7 cm in breadth at the base of the flap which was marked transversely at the level of the posterior end of the introitus. The flap tapered off gradually with the tip reaching the groin near the femoral triangle.

Flap dissection was started at the tip of the flap in subfascial plane taking epimysium of adductor muscle with the deep fascia. A few vicryl sutures were used to anchor the deep fascia to the flap to prevent shearing and injury to the pedicle. The flap was elevated until the posterior margin was reached which was then incised to the level of subcutaneous tissue thus completely islanding the flap. A tunnel was developed under posterior part of each labia majora and each flap was passed through this tunnel into the newly formed vaginal cavity at the introitus. Both the flaps were then sutured in the midline, first completing the posterior suture line and then the anterior suture line, to form a vaginal tube by keeping the skin side on the inside of the tube.

The neovagina was then inserted into the depth of the previously created space in between the rectum and urinary bladder with the help of Hager's dilator. The upper end of the tube was not fixed to any pelvic structure like cervix as it was not present. Instead antibiotic soaked gauze were

placed in the neovagina to maintain contact of the flaps with the perivesical and perirectal tissues for self anchorage. Finally the lower end of this neovaginal tube was sutured to the mucocutaneous junction to form the vaginal introitus.

Haemostasis was secured at the flap donor sites. A suction drain was placed on each side and the wounds were then closed in layers with absorbable sutures. The patient was kept in bed with thighs adducted for 48 hours. Vaginal pack was removed after 48 hours and urinary catheter after 5 days. They were discharged on 7th post operative day after removal of drains. All cases were encouraged to come for regular follow-up visits every month for at least one year to assess the results as regards the length, width, appearance, sensation and function of the new vagina. The data was entered and analyzed by using SPSS version 20.

### **RESULTS**

Out of 08 patients with vaginal atresia, 03 (37.5%) were diagnosed as MRKH syndrome and 5 (62.5%) were diagnosed as cases of isolated vaginal atresia. The age range was between 16 and 30 years. Seven patients presented with primary amenorrhea and one was recently married having no previous idea about the nature of her abnormality and presented with inability to have intercourse. Reconstruction of vagina was done in these 08 patients with 16 neurovascular pudendal thigh flaps. The mean length of the flaps was 15 cm and the width was 6 cm. The mean neovaginal length measured at the end of the procedure was about 11.5 cm and the width was  $4.2 \pm 0.2$  cm. The donor site was closed primarily in all patients. The mean operative time was  $3.15 \pm 0.20$  hours. In 7 (87.5%) patients all flaps survived completely. There was 01 (12.5%) case of unilateral distal flap necrosis followed by severe infection that was managed conservatively. The mean hospitalization time was  $07 \pm 2$  days. Our mean follow up was for 1 year. The length and width of the neovagina were assessed during the follow up visits. The mean vaginal length after 1 year was  $9.5 \pm 0.5$  cm and mean width was  $3.8 \pm 0.5$  cm permitting two fingers. The patients did not require any stent or dilatation to maintain the width except one patient of distal flap necrosis who showed significant shrinkage of neovagina (7 x 3 cm), however it responded well to frequent dilatation and wearing stent (cotton filled condom) over night for 3 months. All the flaps also showed preserved sensation



especially near the base. Hair growth was reported by all patients in the neovagina. Three patients (37.5%) were bothered about this but were satisfied with the use of hair removing creams. Rest of the patients did not find the hair disturbing. Intercourse was permitted after 6 weeks. Unmarried patients were encouraged to get married at their earliest. The functionality of the neovagina was assessed during the follow-up visits of the married patients. They were advised to use small amounts of emollients or lubricating gel during the sexual intercourse. Sexual life was assessed to be satisfactory in 5(62.5%) and unsatisfactory in 2(4%) one year postoperatively, 1(12.5%) one patient did not get married and lost follow-up. The flap donor site scars healed well and were well hidden in the groin crease.

## DISCUSSION

Vaginal agenesis is a rare congenital anomaly of the female genital tract which can occur isolated defect or with other syndromes.<sup>2</sup> The fallopian tubes and ovaries are usually normal. Patients with MRKH usually present with primary amenorrhea or inability to have intercourse.<sup>12,13</sup> In our study, out of 08 patients with vaginal agenesis, 03 (37.5%) were diagnosed as MRKH Syndrome and 5 (62.5%) were diagnosed with isolated vaginal agenesis. The ideal vaginoplasty is one in which the reconstructed vagina has a natural and physiological angle and a correct anatomic axis to facilitate intercourse. It should be sensate and there should be no need for obturator or stent to maintain its patency.<sup>5,14</sup>

There are many methods of vaginal reconstruction with their own advantages and disadvantages.<sup>8,9,15</sup> Several studies have established that vaginal reconstruction with pudendal thigh flaps overcomes various disadvantages associated with graft vaginoplasty and numerous other techniques.<sup>12,16</sup> Pudendal thigh flap is an axial pattern fasciocutaneous flap with reliable vascularity and sensation in its lower part. The flap was first described by Wee and Joseph<sup>17</sup> in 1988 after they studied the blood and nerve supply of upper thigh skin, medial groin, and perineum in fresh cadavers. They operated on three patients of vaginal agenesis with good results. Thereafter, several authors have described on the use of this flap in a bilateral manner to reconstruct vaginal atresia.<sup>18-20</sup> This technique is superior to currently available methods because it is simple and

reliable. No stents or dilators are needed postoperatively. The reconstructed vagina has a natural angle for intercourse and is sensate in the lower half with the same erogenous potential as the perineum and upper thigh.

In this study, the pudendal thigh flap was used to construct the neovagina in eight cases having congenital vaginal agenesis. The age ranged between 16 to 30 years. One of these cases was recently married. We believe that these cases were not discovered earlier because of the cultural taboos limiting early diagnosis especially in rural areas from which these cases came from. When presentation is earlier in childhood, any surgical and nonsurgical method of vaginal reconstruction should be deferred until adolescence or even adulthood when the patient reaches physical and psychological maturity.<sup>21</sup> We believe that vaginal reconstruction should be performed when the patient is emotionally mature and motivated to maintain a neovagina once it is created.

In our present study, the mean length of the neovagina was 9.5 cm and the mean width was 3.8 cm one year postoperatively. Loss of neovaginal length was observed in one case which was complicated by unilateral distal flap necrosis and then infection. Giraldo<sup>18</sup> in his study elevated 40 flaps for 20 vaginoplasties. He reported the mean depth of neovagina as 9.5 cm and width as 3 cm and concluded that vaginoplasty with these flaps has multiple advantages and fewer inconveniences. Ganatra and Ansari<sup>20</sup> used the same technique in five patients, they reported easy entry of two fingers in the neovaginal pouch, and the vaginal length was 8 cm. Ajmal and Yousaf<sup>16</sup> in their study reconstructed 19 vaginas with pudendal thigh flap. They reported the mean length of neovagina 9.2 cm and width 4.3 cm one year postoperatively. One patient in our study needed post operative dilatation which was complicated by distal flap necrosis and infection.

Neovaginoplasty with Pudendal thigh flaps has the advantage over the graft vaginoplasty of no postoperative requirement for dilatation or stenting to avoid stenosis.<sup>12,16,18-20</sup> In vaginoplasties where skin grafts are used, the maintenance of neovaginal patency requires regular dilatation, until regular sexual intercourse occurs, otherwise reconstructed vagina gets shrinkage due to contraction of graft leading to vaginal stenosis.<sup>8-9,14-15</sup>

In our study, one patient (12.5%) has infection and 3 patients (37.5%) showed significant hair growth, matter of concern, in the neovaginal pouch. Hair

growth was reported by the patients as aesthetically displeasing and no functional problem was observed. Giraldo et al<sup>22</sup> noticed that hair growth was more a cosmetically unpleasant problem than a functional one. Similarly in other studies hair growth has been found to be an aesthetic issue and not a functional problem.<sup>16,19,23</sup>

Regular depilation of hair was advised to all of them. All of the patients in our study belonged to poor socioeconomic status and could not have preoperative laser hair removal as advised in literature<sup>19</sup>. Giraldo<sup>22</sup> also noted near complete hair atrophy in vaginal flaps, especially in posterior two third of vagina, in long term follow up.<sup>22</sup> Our follow up was not very long and the patients are being followed up for later hair atrophy.

The operative time in most of the studies reported, was 2.5-3 hours.<sup>12,16,20</sup> Our mean operative time was 3.15 hours. The blood loss was minimal. All patients reported a positive attitude towards life and relief of anxiety after surgery. The functional outcome was excellent in six patients and satisfactory in one patient. We believe that technically good reconstruction as well as stable psychological status and supportive husbands all integrate to achieve satisfactory sexual life.<sup>24</sup>

## CONCLUSION

Neovaginoplasty using bilateral island pudendal-thigh flaps is one of the best methods of vaginoplasty in cases of congenital vaginal agenesis. This technique is very simple, safe and reliable and has shown satisfactory functional and cosmetic results. The neovagina was sensate and has a natural angle for intercourse. It was performed in one stage and no postoperative stenting or dilatation was required to maintain patency. The donor site was closed primarily and the resulting scar was hidden in the groin crease with little secondary deformity.

## Conflict of interest

The authors have declared no conflict of interest.

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