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STUDY OF NEWLY MODIFIED DAVYDOV'S NEOVAGINA CREATION TECHNIQUE IN PATIENTS OF MRKH SYNDROME

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ABSTRACT

Introduction: MRKH (Mayer-Rokitansky-kuster-Hauser) syndrome is not a very rare entity with the incidence of 1:4000-5000 female births. The common presentation is primary amenorrhoea and is characterized by uterine and vaginal agenesis. There are many surgical methods to create neovagina but there is no consensus on the best one. Here we are presenting the new and simple modification of Davydov's periotoneal vaginoplasty, only posterior peritoneal flap pull down, which is safe and effective and can be done by gynecologist with average laparoscopy skills. **Aims and Objectives:** To assess the anatomical and functional outcome of new modification of Davydov's peritoneal vaginoplasty. **Material and Methods:** Total 18 patients were treated with this method from January 2018 to March 2025. Only posterior peritoneal flap pull down method is used. Postoperatively regular dilatation of neovagina is advised for 3 months. Sexual intercourse is allowed after 3 months of surgery. At the end of 6 months the anatomical and functional success of the procedure is assessed by vaginal length, breadth and FSFI-6 score. **Results:** The average surgical time is 61 min with average blood loss of 86 ml. The average hospital stay is 10 days. There were 2 rectal and 1 bladder injury. No postoperative complications. The average vaginal length achieved was 7.3 cm and breadth 3.2cm. The average FSFI-6 score was 25.3. Only 3 patients have mild dyspreunia. **Conclusion:** Our new modification of Davydov's peritoneal vaginoplasty is easy to perform, safe and effective method of creating neovagina in patients with MRKH syndrome.

INTRODUCTION

The developmental abnormalities of Mullerian duct are common and lead to various pathologies which can cause amenorrhorea, infertility, dysmenorrhoea, non menstrual pelvic pain, endometriosis and various obstetric complications. Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome is one of such abnormalities characterized by agenesis of uterus and vagina, normal ovarian function, normal development of secondary sex characters and normal karyotype. Various other abnormalities like renal (40 %) and musculoskeletal (10-15%) are associated with MRKH syndrome.[1] The incidence of MRKH is 1:4000-5000 female births.[2] The common presentation is primary amenorrhea in adolescent girl and sometimes inability to do vaginal intercourse as a primary complaint. This gives a great psychological trauma to the girl and her family. The treatment of vaginal agenesis is surgical creation of neovagina and treatment of uterine agenesis and inability to have the genetic child is either by surrogacy or by uterine transplant and assisted reproductive techniques. Surgical creation of neovagina will help to have vaginal intercourse. As the girl grows older and plans to marry, she and her family request for neovagina creation surgery to permit the satisfactory vaginal intercourse.

Numerous nonsurgical and surgical techniques have been described for creation of neovagina in patients with MRKH syndrome; however no consensus has been reached on the best surgical treatment option.[3] Frank's dilation which is the nonsurgical method should be advised first.[4] It is time consuming and doesn't give satisfactory results. In cases of dissatisfaction, noncompliant or if patient wants surgical treatment; there are many surgical techniques for neovagina creation. Mcindoe's split thickness skin graft and mold,[5] intestinal or sigmoid vaginoplasty,[6] amnion graft.[7] laparoscopic Vecchietti technique[8] and using pelvic peritoneum by Davydov's or modified Davydov's techniques.[9-11] Each of the above procedure has a disadvantage like Mcindoe's skin graft creates the problem of hairy vagina, needs skin from other part of the body and leaves a scar there and also needs involvement of a plastic surgeon. Sigmoid vaginoplasty is a major bowel surgery and causes excessive vaginal secretions. Vecchietti procedure is technically complicated and needs specialized instruments. Amnion

graft is a biological one and has risk of transmission of viral diseases. Interceed is not freely available and is a costly material. Davydov's peritoneal pull\through procedure needs extensive peritoneal mobilization[12,13] which needs high level of laparoscopic skills and at risk of injury to pelvic blood vessels and ureter. Here in this case study we have done a simple modification of Davydov's method, "only posterior peritoneal flap pull down", which is simple and can be done by average skilled laparoscopic surgeon with satisfactory results and comparable safety.

OBJECTIVE

To assess the functional and anatomical outcome of "only posterior peritoneal flap pull down" modification of Davydov's peritoneal vaginoplasty.

MATERIAL AND METHODS

All 18 patients were diagnosed clinically to have MRKH with USG and clinical examination showing absent uterus and vagina and normal secondary sex characters; from January 2018 to march 2025. All patients' blood sample were sent for karyotype to confirm 46 XX and the diagnosis of MRKH. After doing all preoperative workup, fitness and bowel preparation the peritoneal pull-through surgery is done under general anesthesia in modified lithotomy position. Initially the laparoscope is introduced in abdominal cavity to examine the pelvis. The surgery has two steps. Step1 is perineal step and step2 is laparoscopic step.

Perineal step: Foleys catheterization is done. The vaginal vestibule (fig 1) is infiltrated with normal saline and a 2 cm horizontal incision is taken 2mm above the mucocutaneous junction of fourchette. With the combination of blunt and sharp dissection a vesicorectal space is created to accommodate a good sized Sim's speculum (fig 2). Here in this step there can be bleeding from paraurethral area and complete haemostasis should be achieved. A wet and folded gauge pad is taken on a sponge holder or any long instrument and the apex of this vesicorectal space is elevated.

Laparoscopic step: A horizontal incision is taken on the elevated apex of vesicorectal space and extended laterally between round ligament and uterosacral of each side to get breadth of 5 cm (fig 3). The posterior peritoneal margin (fig 4) is pulled down to suture at vaginal vestibule and sutured with vicry no. 1 at 3-4 places. Before starting this modification of only posterior peritoneal flap pull down, we performed anterior and posterior peritoneum pull down in five MRKH patients and encountered two patients with retention of urine which took 1-2 weeks to resolve. We thought that it was probably due to pull on urinary bladder. This was the basis of starting this modification and in next 18 cases we pulled only posterior peritoneum and took anterior margin into the creation of apex of neovagina. Posterior peritoneum is fixed at posterior part of vaginal vestibule at 3 places (fig 5) with vicryl no 1 and apex of neovagina is created by taking right angle of anterior peritoneal margin, peritoneum of right lateral pelvic wall carefully avoiding ureters, anterior serosa of rectum, left lateral pelvic wall and left angle of anterior peritoneal margin and tied in a purse-string manner with vicryl no 1(fig 6). Additionally uterine strands are sutured at apex to give extra support to the vaginal apex and to prevent vaginal prolapse.[14] A 10 cc plastic syringe mold is created by covering with two gauge pads and condom and inserted in the newly created vaginal space and labia majora stitched together to safeguard the mold. The blood loss was average and none of the patients required intraoperative or postoperative blood transfusion. Blood loss was measured by subtracting the dry mop weight from the wet mop weight. Difference of 1gm is equal to 1 ml, this was done for perineal step. For the measurement of laparoscopic step blood loss we subtracted irrigation fluid volume from suctioned fluid volume. Addition of above two is done to calculate the total blood loss in the surgery. Mold and Foley catheter are removed after 48 hrs and dilatation with silicon dilators started three times a day. Xylocain jelly is applied on the dilators as lubricant and local anaesthetic to reduce the pain. Patient is trained for self dilatation under supervision before discharge. Patient is discharged on day 10 of surgery and stitch removal is done before discharge. Dilatation is done for 3 months after the surgery and then sexual intercourse is allowed. At this follow up visit we have taken scrapping from anterior wall of the neovagina, as it was not covered by peritoneum. Three months after the sexual activity is started, vaginal length and breadth is measured to know the anatomical success and the Female Sexual Function Index -6 (FSFI-6) score is calculated to assess the function success which is the ultimate goal of our surgical treatment. FSFI-6 is self reported and simpler modification of 19 point FSFI which is quite tedious to report. Desire, Arousal, Lubrication, orgasm. Satisfaction and pain are the components of FSFI-6. Desire and Satisfaction are reported on a scale of 1-5 and remaining parameters are measured on the scale of 0-5. Thus the minimum score is 2 and maximum score is 30. Lower the score more is the sexual dysfunction.[15] Follow up is done every month for 3 months and then every 3 months for a year and then yearly.

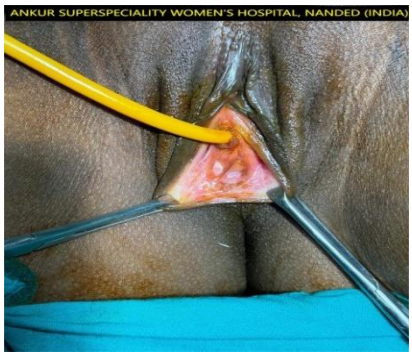


Fig. 1

fig. 2

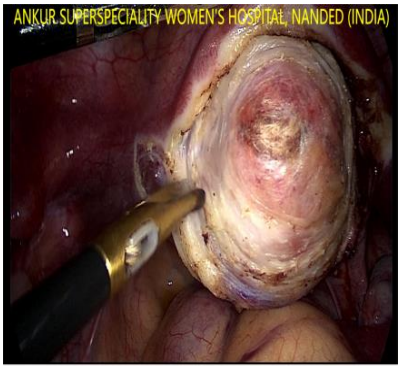
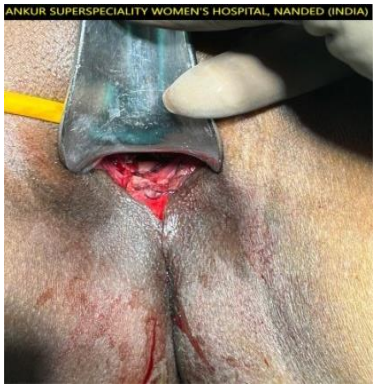


Fig. 3

Fig. 4



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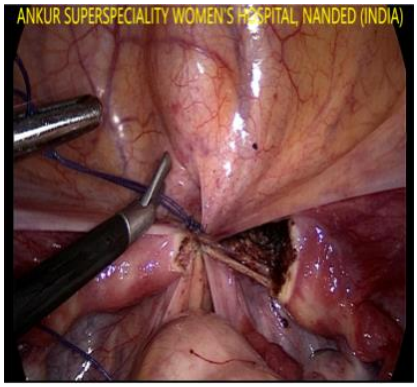

Fig. 6

OBSERVATIONS

Serial no	Surgical duration (min)	Hospital stay (days)	Average blood loss (ml)	Complications during surgery	Vaginal length (cm)	Vaginal breadth (cm)	FSFI score	Dyspareunia
1	90	10	150	NA	7	3	30	
2	100	10	175	Rectal inury	7	3	25	Mild
3	90	10	180	NA	9	3.5	30	
4	70	10	140	NA	4	1.5	6	
5	75	10	100	NA	8	4	29	
6	80	10	90	Rectal injury	7	3	30	
7	55	10	80	NA	7	3.5	24	
8	70	10	100	NA	4	2	10	
9	50	10	50	NA	7	3	24	Mild
10	40	10	65	NA	9	4	30	
11	40	10	50	NA	7	4	30	
12	60	10	85	Bladder injury	9	3.5	30	
13	45	10	50	NA	9	4	29	
14	40	10	50	NA	8	3	28	
15	50	10	40	NA	7	2.5	21	Mild
16	45	10	55	NA	8	4	30	
17	45	10	50	NA	NA	NA	NA	NA
18	50	10	45	NA	NA	NA	NA	NA

RESULTS

The average operating time was 61 minutes. None of the patients required intra-operative or postoperative blood transfusions with the average blood loss of 86 ml. Hospital stay was of average 10 days. In this stay she was kept admitted for vaginal dilatation training and monitoring. We had 2 (11 %) rectal injuries during perineal step. Those were small 1-2 cm opening in anterior wall rectum. Repaired with 2-0 polyglactin and procedure of vaginoplasty continued. Both patients didn't develop any postoperative complications like fistula. We had 1 (5.5%) bladder injury during laparoscopic step, which was 1 cm, identified intra-operatively and sutured with 2-0 polyglactin. This patient also didn't develop any postoperative complications or sequelae. There were no other early or late post operative

complications. The scrapings from anterior wall of neovagina which was not covered by peritoneum showed excellent squamous epithelium at the end of three months (fig 7).

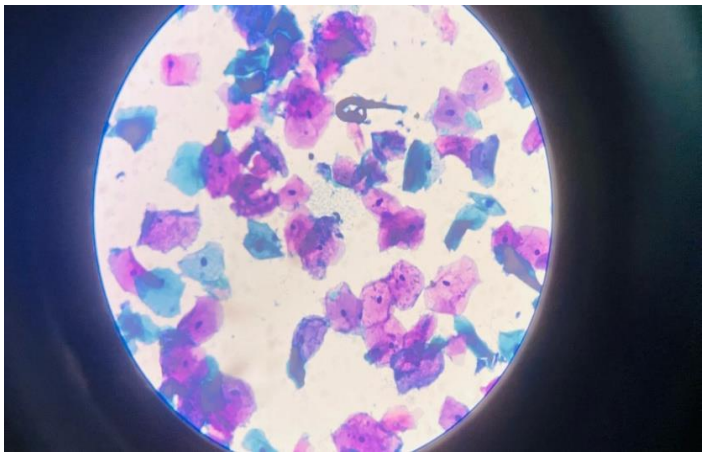

Fig. 7

Out of 18 cases of only posterior peritoneal flap method, 16 are married now and two are yet to marry and are done recently in last two months. Out of sixteen, 2(12.5 %) patients developed vaginal stenosis and are not active sexually. Forteen patients (87.5%) patients are satisfactied with vaginal intercourse and are happy with their sexual life. Out of 14 patients who are sexually active 3(21%) had mild dyspareunia and having slight discomfort during vaginal intercourse. None of the patients had vaginal discharge, granuloma or prolapse. At the end of six month postoperatively, we measured the vaginal length and breadth for anatomical success and FSFI-6 for the functional success. The average vaginal length achieved was 7.3 cm and average vaginal breadth achieved was 3.2 cm. the average FSFI-6 was 25.3.

DISCUSSION

Patients with MRKH syndrome request neovagina creation surgery for their sexual and psychological wellbeing. Neovagina creation is also a pre-requisite for uterine transplant surgery.[14] There are nonsurgical and many surgical techniques available for neovagina creation. ACOG committee recommends non-surgical method as a first line treatment. Non-surgical treatment (Frank's Dilatation) has got its own limitations like prolonged treatment period, noncompliance and results are not as satisfactory as surgical methods. There are many surgical techniques available but no consensus has been reached on the best surgical treatment option. The optimal vaginoplasty surgery is the one which achieves adequate vaginal length and width, simple to perform with minimal complications, minimal scarring and gives good sexual satisfaction.[16] Amongst all, the peritoneal vaginoplasty has very high aesthetic satisfaction, excellent regenerative property and very less chance of graft rejection.[17] There are situations like pelvic kidney where peritoneal pull down technique is not feasible. We had come across two such patients; MRKH with pelvic kidney for which we did interceed method and not included in this study. In this case study we have used only posterior peritoneum which is easy to create and easy to mobilize. This modification prevented the complication of post operative urinary retention. None of these patients developed post operative urinary retention. In this modification, anterior and lateral walls of neovagina were not covered with peritoneum. This uncovered area is epithelised by peritoneal regeneration and probably by remnants or embryonic vestages of mullerian duct in this area.[17] The complications of injury to rectum and bladder are related to the creation of vesicorectal space which is common to many surgical techniques and not specific to this modification. As this step is a blind step and has got learning curve, these injuries are common in initial cases and become rare as your skills go up. Postoperative dilatation and follow is equally important to maintain the functionally good vagina. First 3 months are very important for dilatation because it is contractile phase of newly created vagina. Once this period is gone, there is a little chance scarring and stenosis. The vaginal intercourse is allowed after 3 months which in turn will maintain the functional vagina. Case selection for surgical treatment is very important to have good results. It is important to plan a neovagina creation surgery in females who are emotionally mature and willing to get engaged in regular sexual activity soon after the surgery. We didn't operate the patient immediately after the diagnosis. We explain to the patient and her family about the condition and expectation from the surgery. Surgery is planned soon after she decides to marry so that she can continue vaginal intercourse to keep the vagina functional. It is also very important to involve her would be husband in the presurgical counseling; at least in our social conditions. Husband and his family members are explained about the benefits and risks of surgery. They are also explained that she won't be menstruating and cannot have child bearing capacity. They are counseled regarding surrogacy and uterine transplant for the purpose of pregnancy. If all this counseling is done, there will not be marital disharmony on this ground and this will bring clarity in their relationship, increases the

intimacy which will result in good sexual life and maintaining the good functional vagina. Failure to do postoperative dilatation or if she doesn't do regular vaginal intercourse, will result in vaginal stenosis. Two of our patients who developed vaginal stenosis had marital disharmony for some social reasons and could not engage in sexual activity and were non compliant for vaginal dilatation. This again indicates that patient selection, proper pre and post operative counseling, vaginal dilatation and later on vaginal intercourse are very important for the success of neovagina creation surgery.

CONCLUSION

The simple modification of Davydov's peritoneal vaginoplasty "only posterior peritoneal flap pull down " is easy to perform, effective with acceptable complication rate and can be performed by gynaecologist with average laparoscopic skills. The postoperative dilation for three months is very critical for the success of the surgery. Preoperative counseling and timing of the surgery is again crucial for maintaining the functional vagina.

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