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FUNCTIONAL AND ANATOMICAL RESULTS AFTER Mc INDOE VAGINOPLASTY

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ABSTRACT: BACKGROUND: Mullerian agenesis is a challenge to reconstructive surgeons. In order to create a new vagina that mimic the normal one in size, lining and appearance, multiple techniques have been designed; among these techniques Mc Indoe vaginoplasty represents the simplest one with good results. **PATIENTS AND METHODS:** Five patients with mullerian agenesis underwent Mc Indoe vaginoplasty, they were followed for 12 months and their functional and anatomical results were recorded and compared with a control group of normal females. **RESULTS:** Patients treated by Mc Indoe vaginoplasty showed high success rate for creation of vagina that were approximately similar to normal one in size (length=12 cm and diameter= 4cm) , functionally their sexual satisfaction measured by FSSI were the same as in normal female. **CONCLUSION:** Mc Indoe procedure is a successful operation for creating an anatomical, functional and aesthetical satisfying vagina.

KEYWORDS: Mc Indoe Vaginoplasty, Mullerian agenesis.

INTRODUCTION: Mullerian agenesis is a rare but crippling anomaly; its incidence varies from 1: 4000 to 1:10000.¹ If it is left untreated, there will be sexual inability and patients may develop severe psychological problems.² Numerous procedures were described for creation of neo-vagina with acceptable function, feeling and appearance.³ They included serial dilation,⁴ Vecchietti's technique,⁵ sigmoid or ileal flaps,⁶ Gracilis flap,⁷ Singapore flap,⁸ and expanded vulval flap.⁹ Among these options the modified Mc Indoe technique gained popularity being the simplest operation with very low donor site morbidity.¹

Long-term changes in neo-vagina created by this technique were area of interest in researches regarding anatomical, histological, chemical, bacteriological and sensory condition.^{10,11} In this study we evaluated functional and anatomical result of the patients subjected to this technique.

PATIENTS AND METHODS: This prospective study included five patients with Mullerian agenesis to whom modified Mc Indoe vaginoplasties were done June 2004 to March 2014. Patients' ages ranged from 18 to 27 years (mean 23.11±3.01), for functional assessment of neo-vagina recently married and unmarried patients who were going to marry within 6 months were included. Regarding about educational level, four cases had some primary education, and one had high school education. None of our patient was receiving psychiatric medication for any other causes. All patients had vaginal dimple smaller than 1cm. Comprehensive, clinical examination, hormonal assay, karyotype studies, radiological evaluation (Ultrasonography & CT) and diagnostic laparoscopy if needed were done to confirm diagnosis and to detect other associated anomalies.

Mayer- Küster-Rokitansky-Hauser syndrome (MKRHS) was the final diagnosis of all cases. Modified McIndoe operations were done as described in previous articles (Fig. 1 to 7); through a transverse incision an average twelve centimeter pouches were created between the urethra & bladder anteriorly and the rectum posteriorly. Urethra & bladder were protected by a urethral

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catheter & rectal packing with a roll gauge (Fig. 1) was done to protect the rectum. After careful haemostasis the cavity was covered with partial thickness skin graft with raw surface outward over a mould (Fig. 2) prepared by 50 cc syringe, cotton pad & condom. After surgery patients were kept on low residue diet until the first dressing which was done five days after surgery. During this dressing, neo-vagina was washed by normal saline, grafts taking were reported, and moulds were washed and returned back to the neo-vagina. Patients were instructed to keep the mould in place continuously for at least three months and it was removed only for washing. Patients were followed every other day till the complete epithelisation of pouches, then every month for one year, then every three months, thereafter, the average follow-up period was 12 months. During these visits, neo- vaginas (Fig. 7) were inspected for bleeding, discharge, stricture, granulation and any morbidity. Sexual intercourse was allowed and encouraged three months after the operation according to the percentage of graft taking.

One year after the operations the final dimensions of the neo-vaginas were measured, by using a proctoscope. Functional assessments of neo- vaginas were done at the same time using self-assessment questioner which contains the six basic component of sexual function (Desire, arousal, lubrication, orgasm, satisfaction and pain), the total score range from 0 to 30.

RESULTS: All patients recovered well without mortality, injury to surrounding structure, or any early post- operative complication apart from discomfort due to closure of labia over the mould and pain of the graft donor site which was managed well by analgesics. Patients were given inj. Cefotaxime 1gm intravenous twice a day and metronidazole 500 mg intravenous thrice a day for initial five days.

Then patients were put on tablet cefuroxime 500 mg twice a day for another five days post operatively.

Average grafts' taking at the first dressing was about 80% of their size. By the end of fourth week, the whole surfaces of the pouches were completely epithelized under conservative treatment (Debridement of nonviable graft, washing with saline and betadine). The average hospital stay was 10 days. Epithelization of donor site took two weeks, without keloid or scar formation.

By the end of the three months patients had vagina with acceptable size (length=12cm and diameter=4 cm), an average of one sexual inter- course every week was obtained.

Only one patient developed stenosis, this patient was not strictly adherent to regular mould application and sexual intercourse because her husband was in army. It improved after proper instructions.

All husbands ratified their sexual relation as satisfactory but due to our culture which does not allow multiple partners; comparative evaluation of their satisfaction was not possible.

Three patients had good sexual function (Score= 30), two patients had satisfactory functions (Score= 26). These two patients also improved with use of lubricants.

Case Number	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain	Total
1	5	5	5	5	5	5	30
2	5	5	4	4	4	4	26
3	5	5	5	5	5	5	30
4	5	5	4	4	4	4	26
5	5	5	5	5	5	5	30

Table 1: Showing results of individual female sexual function score parameters

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DISCUSSION: Creation of new vagina with acceptable and durable size, soft and moist lining as well as aesthetically looking shape with low morbidity is the target of all reconstructive surgeons in management of Mullerian agenesis.¹

For this target, multiple techniques are described ranging from simple skin graft lining for surgically created pouch,¹¹ to more complex procedure that requires laparotomy and intestinal resection, or harvesting flaps with technical difficulties and lengthy operations.^{7,8}

Out of these techniques, modified Mc Indoe vaginoplasty so far represents the simplest one with least morbidity,¹² is the procedure of choice. This low morbidity is also supported by our results where none of our patients reported any complication that needed surgical intervention or a complication that has long term sequel.

Mc Indoe technique not only has minimum complication, but also it can create a neo-vagina that anatomically and functionally looks like the normal one. Regarding anatomical aspect the average size of the vagina that obtained in our study was 12 cm in length and 4 cm diameter, which is approximately the same as it was in other studies, using the same technique,¹² and in our series the dimension of new vagina was approximately similar to that of normal vagina.¹³ This similarity of neo-vagina to the normal one extended to include the epithelial lining.¹⁴

Although most of studies reported a high success rate of Mc Indoe procedure to restore normal sexual function which varied from 75% in some series up to 100% in other studies,¹⁵ yet none of them used a specific surveying scale to accurately assess the whole sexual satisfaction.¹⁶ Instead of that, most of these studies relied only on the presence of lubrication and orgasm or absence of pain as an indicator of sexual function.^{12,17}

Since Rosen introduced his female sexual index more than decade ago,¹⁸ little number of studies utilized it to assess the sexual function after vaginoplasty, among these studies Mc Indoe procedure was not the elected technique.¹⁹

The total female sexual function scores in patients group and in normal females were >25. Although there was an apparent difference in pain parameter, still it did not reach the level to be significant. Explanation of this similarity in FSSI comes when we understand the physiology of sexual function which is a complex mechanism that requires harmony between involved hormones,²⁰ prefrontal cortex and limbic system,²¹ emotions,²² and finally triggered by intact genital structure including clitoris, vagina, urethra, periurethral gland, and pelvic muscles.²³ The only defect in patients with MKRHS is the absence of the vagina while other genital structures are intact²⁴.

Moreover, Vesanovic and associates had studied different stimuli to the neo-vagina that were reconstructed by Mc Indoe technique after one year in twenty one patients, and compared it with sensory status of vaginas of normal females, and they demonstrated appearance of the types of sensations (Touch, warmth, coldness) which were as same as that found in normal females.¹⁰ While the obvious difference in pain could be attributed to disproportion in the size of penis and vagina in a case that did not stick to regular use of mould, and this finding emphasizes on the importance of strict postoperative dilatation.

Husbands of our patients mentioned that they had a satisfactory vaginal penetration, although we did not compare this relation with a normal female without vaginal agenesis, but in other studies male partners found no difference between their current operated females and other women without anomaly.²⁵

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Fig. 1: Pre-operative photograph showing mullerian agenesis

Fig. 2: Per-operative photograph showing space creation for vaginoplasty

Fig. 3: Photograph showing Construction of vaginal mould

Fig. 4: Photograph showing reversed skin graft application over a mould

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Fig. 5: Photograph showing complete space formation for vaginal mould

Fig. 6: Photograph showing vaginal mould in place with vulval stitches

Fig. 7: Photograph showing neo-vagina 3 months post-operative

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