Original Article

Our Experience in the Management of Vaginal Agenesis: Its Psychosocial Impact and Role of Contrast Magnetic Resonance Imaging Scan with Vaginal Mold in the Interpretation of High Transverse Vaginal Septum

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Background: Mullerian anomalies are of many types, and it is very difficult to classify them in a simple method and plan reconstructive surgery. The aims, objective and the reconstructive surgical approach varies according to the level of vaginal agenesis as seen in our experience of management of 11 cases. The difficulties in the perception and interpretation of the surgical anatomy on magnetic resonance imaging can be minimized by placing a soft vaginal mold inside the lower developed vaginal segment in cases with transverse vaginal septum.

Methods: Retrospective observational study.

Results: All the operated 10 adult patients showed good created vaginal space which helped in creating good bonding in between the couples to maintain the integrity of marriage. Better successful reconstructive surgical planning by placing a soft vaginal mould in the vagina during MRI scan helps in understanding the level of septum in our single operated case of transverse vaginal septum and given excellent postoperative result. Conclusion: The impact of surgery on family life and sexual profile of the patient postsurgery on long-term has been mentioned on rare occasion. The preoperative counseling of the couples helps in better postoperative outcome in terms of psychological and sexual satisfaction of the partners and in the treatment of primary amenorrhea and infertility.

Keywords: Magnetic resonance imaging with vaginal mold, psychosocial effect, transverse vaginal septum, vaginal agenesis

INTRODUCTION

Congenital anomalies of female genital tract are difficult to diagnose at birth. They may present at the time of puberty with primary amenorrhea or present late with infertility or some obstetric complications. Mullerian anomalies may result from maldevelopment of mullerian duct (MD) or defective fusion of duct or failure of resorption. Transverse Vaginal septum results from incomplete fusion between MD and urogenital sinus. The presentation may vary depending on complete or partial septum. In complete septum, presentation occurs early with primary amenorrhea and may be a palpable mass in lower abdomen due to the accumulation of blood. In partial septum, the presentation gets delayed due to egress of some menstrual blood through the septum, and they present late with dysmenorrhea, dyspareunia, or infertility. Magnetic resonance imaging (MRI) is considered to be gold standard for diagnosis of mullerian anomalies. Here, we are discussing our experience of 11 cases of vaginal agenesis with varied presentation and use of soft mold inside the vagina during MRI for diagnosis transverse vaginal septum.

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MATERIALS AND METHODS
Our experiences of 11 cases of MD anomaly are presented in view of:
• Preoperative diagnosis
• Counseling of patient and her family members
• Postoperative care and follow-up result
• Challenges faced during the diagnostic investigation and entire course of treatment.

Retrospective observational study of 14 cases of agenesis of vagina was done.

Out of these 14 cases, there were 11 adult cases of the age group of 17–25 years and 3 children of 2–8 years. One adult and two children did not follow-up after the first consultation; and hence, our experience of only 11 cases from 2007 to 2017 is discussed. Cases have been studied in respect to age of presentation, complain at the time of presentation, evaluation to know the type of anomaly and managed accordingly.

The pediatric patients [Figure 1] were surprisingly diagnosed during routine clinical examination of private parts for their complaints of itching and redness over perivaginal area due to poor hygiene.

Adult cases had presented with a history of primary amenorrhea and/or primary infertility after marriage.

All the cases were investigated for specific investigation such as karyotyping and contrast MRI scan of abdomen and pelvis.

DISCUSSION
Vagina as per earlier knowledge was described to arise from downward growth of the Wolffian and MDs, with the sinovaginal bulbs located at the caudal ends of the Wolffian ducts. The current molecular studies show the whole vaginal epithelium is derived from the paramesonephric (müllerian) duct with bone morphogenic protein 4 reshaping the intermediate mesoderm-derived MD into the vaginal primordium.[1] The transverse vaginal septum is a rare condition which occurs due to a defect in vertical fusion during embryological development of the vagina.[2] Rokitansky syndrome and complete androgen insensitivity syndrome are the most common causes of vaginal agenesis. The Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome is a spectrum of müllerian anomalies characterized by congenital vaginal aplasia and absent uterus or a rudimentary one in female subjects with normal endocrine status. The ovaries and fallopian tubes are present. The prime feature is a primary amenorrhea in women presenting with normally developed secondary sexual characteristics and normal external genitalia. The etiology remains unknown.[3]

It is difficult to collect all the different varieties of vaginal malformation and classify them in a simple method which will help in deciding the reconstructive surgery.[4] Hence, our aims, objective and the management varies according to the level of vaginal agenesis.

The MD agenesis can be effectively managed by correct clinical and radiological diagnostic evaluation of the underlying condition and associated congenital anomalies. Psychosocial counseling of patient and her family members regarding the functional effects of genital anomaly along with its various treatment options is equally important to get optimum sexual satisfaction and functional result.[5] The patient and her family should be explained about child adoption, surrogacy, and assisted reproductive techniques according to the level/type of MD agenesis.[2,6]

The basic diagnostic investigation which decides the treatment option in the cases of MD agenesis along with other congenital urogenital anomaly are karyotyping[7] and contrast MRI scan of abdomen and pelvis. MRI can help in avoidance of otherwise purely diagnostic surgery.[8,9] The perception and interpretation of the surgical anatomy and different diseases of the vagina can be definitely improved by various advanced radiological imaging techniques such as radiopaque coils and aqueous gel.[10] It is very difficult to identify and measure the distance from lower end of cervix to the vaginal septum in cases of partial agenesis of vagina/transverse vaginal septum on transvaginal ultrasonography (USG) and contrast MRI scan due to collapsed walls of vagina. In our case of transverse vaginal septum, a soft, adequate size vaginal mold was placed inside the patient’s vagina without any pressure, and the radiologist was requested to conduct MRI scan of pelvis. The MRI pelvis with the vaginal mold helped
in identification of the dome-shaped walls of vaginal septum and better differentiation of distance of lower end of cervix to the transverse vaginal septum. The main purpose of management of MRKH syndrome is to create a neovagina for better sexual life and options for having children by adoption or gestational surrogacy along with good psychological support.\cite{2,5,11} The basic purpose of treatment of transverse vaginal septum is to treat infertility by excision or dilatation of complete or incompletely developed septum and achieve connection in between the lower end of cervix into the lower vagina. There are various surgical methods of treatment of transverse vaginal septum mentioned in literature\cite{11-14} such as dual-force vaginoplasty, high-pressure balloon dilatation, inverted balloon vaginoplasty, exploratory laparotomy, and incision made on vaginal wall with finger guide along the pouch of Douglas. The choice of the surgical procedure for transverse vaginal septum is based on the expertise of the surgeon, level and nature of transverse septum, sociocultural belief to maintain the virginity of the patient by preserving intact hymen.

The age mentioned in the master chart is the age at the first consultation. The child who regularly followed was of 7 years old, and the adults were in 17–25 years of age group. Of 10 adult cases [Figure 2] who followed up to complete the reconstructive surgery, two were unmarried and eight were married. The three married cases were aware of some genital problem in them and had hidden the fact of primary amenorrhea. The four married who had disclosed the fact at the time of marriage were married to a divorcée or a person who had lost the first wife. One married woman had a history of only infertility with the regular menstrual cycle and was diagnosed as a case of transverse vaginal septum with pinpoint track for menstrual bleed. All the 10 adult patients had normally developed secondary sexual characteristics and normal external genitalia.

All the patients and their relatives were explained about the basic purpose, required age and nature of the vaginoplasty surgery, the postoperative care, and child adoption.

All the 11 cases were 46XX on karyotyping. The contrast MRI of the child showed normal pelvic organs with absent vagina, and in nine adult cases, the MRI scan image showed absent uterus and vagina.

In the case of the high transverse vaginal septum, on clinical examination blood was seen trickling through a pinpoint opening in the septum during her menstrual cycle. There was difficulty in interpretation on contrast MRI scan, the distance in between the lower end of cervix and the high transverse vaginal septum. Hence, it was decided to do...
the MRI scan with a soft mold [Figure 3] inside the vagina which separated the walls of the collapsed transverse vaginal septum and helped in the better interpretation of the level of the transverse vaginal septum. This guided in the planning of the reconstructive surgery in a better way.

The nine adult cases of MRKH syndrome were operated by McIndoe’s vaginoplasty surgery [Figure 4]. The one case of transverse vaginal septum [Figure 5] was operated during the 4th day of menstrual cycle by preoperative marking of the pinpoint tract opening by catgut stay suture and exploratory laparotomy done for excision of the septum with the pinpoint tract. After visualization of cervix, vaginal wall was repaired at the level of septum. All the seven married operated cases preferred to bring up the children of husband from previous marriage. None of the couples accepted the method of adoption. All seven married couples were really satisfied about sexual intercourse. The unmarried two adult cases were guided to maintain the patency of the created vagina by regular vaginal dilatation. The operated case of transverse vaginal septum had adequate vaginal space and is waiting for pregnancy.

RESULTS
The results were assessed in view of challenges faced in clinical diagnosis, preoperative counseling, lost follow-up, and postoperative results.

Out of the 14 cases, three cases (one adult and two children) were lost to follow-up may be due to difficulty in accepting the fact of congenital anomaly or the parents of children might want to wait till child achieves the age of adolescence.

Pre-operative counseling helps in better postoperative compliance of patient and their relatives in terms of understanding the postoperative results and psychosocial impact on the patient. All the operated 10 adult patients showed good created vaginal space which helped in creating good bonding in between the couples to maintain the integrity of marriage.

It is very difficult to diagnose the level of complete/incomplete transverse vaginal septum by basic radiological investigation such as USG and MRI. Better successful reconstructive surgical planning was done by understanding the level of septum in our single operated case of transverse vaginal septum, by placing a soft vaginal mold in the vagina during MRI scan.

CONCLUSION
The psychosocial impact, difficulty in marriage issues, and sexual satisfaction of the patient and partner are some of the challenges faced by this population and her family to survive in the Indian Society.

To the best of our knowledge, the impact of surgery on family life and sexual profile of the patient postsurgery on long-term has been mentioned on rare occasion, especially in Indian cultural scenario. In the present study, authors could keep a track of the psychosocial performance of patient and have studied the interpersonal relationship of the patient with family members. It was found that the parents and the patient hide the facts of the surgery from the groom to live respectful married life in the society.

Till now, the soft vaginal mold was used during intraoperative period to place the skin graft during McIndoe’s vaginoplasty and postoperative dilatation. Here, the authors used it as aid during diagnostic radiology for better interpretation of the surgical anatomy of the transverse vaginal septum which helped in planning the reconstructive surgery. It is a cheap and nonmessy alternative to the coils and gel.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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