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VAGINAL ATRESIA AND TRANSVERSE VAGINAL SEPTUM: A REVIEW OF OBSTRUCTIVE MALFORMATIONS

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ABSTRACT
The inability of the urogenital sinus to grow into the bottom third of the vagina causes vaginal atresia, a congenital disease. Although disorders like androgen insensitivity syndrome and complete Mullerian agenesis, which are both characterized by the absence of internal female reproductive organs, can also result in the absence of the vagina, they are typically not classified as vaginal atresia. The uterus, cervix, fallopian tubes, ovaries, and the upper two-thirds of the vagina are among the Mullerian tissues that are typically present in cases of genuine vaginal atresia. Symptoms of a full septum usually appear after adolescence and can include a sensitive mass in the middle of the abdomen caused by blood buildup in the uterus (hematometra) or vagina (hematocolpos), cyclical lower abdominal pain, or primary amenorrhea. Rebuilding or regaining the lower portion of the vagina's functioning is the main goal of treatment. This article highlights clinical aspects and treatment approaches of vaginal atresia and transverse vaginal septum.

KEYWORDS: Vaginal atresia, Vaginal septum, Congenital disease, Gynecological.

INTRODUCTION

Congenital abnormalities of the female reproductive system known as Mullerian anomalies are brought on by the incorrect growth or fusion of the Mullerian ducts and the structures that go along with them. It is thought to be the consequence of several contributing variables, even though the precise reason is yet unknown. The patient's age; from newborn to adolescence or early adulthood; may affect the clinical presentation, which can also affect fertility.[1-3]

Transverse Vaginal Septum

The transverse vaginal septum is one such unusual abnormality; low septa are much less prevalent. The Mullerian ducts' inability to fuse vertically during embryonic development is the cause of this abnormality. Within the vaginal canal, the transverse vaginal septum can form at different levels; most of them occur in the upper third and minimum part in the lower third. A complete or incomplete septum may be the initial manifestation of this disease. In addition, an imperforate septum may manifest as hydrometrocolpos in the newborn period or as amenorrhea, dysmenorrhea, and pelvic discomfort in adolescence. On the other hand, symptoms such as infertility, painful menstruation, dyspareunia, or mild menstrual flow (hypomenorrhea) are frequently caused by a perforated septum. This abnormality can manifest as a longitudinal or transverse septum. The septum may not cover the whole length or width of the vaginal canal in certain situations. The failure of tissue resorption between the caudal end of the united Mullerian ducts and the vaginal plate during development is the specific cause of the transverse vaginal septum. Until adolescence, when symptoms such pelvic pain, irregular menstruation, or discomfort appear, many girls are unaware of the illness. Some may stay

asymptomatic, while others may only become sexually active after experiencing pain during intercourse.[3-6]

Vaginal atresia

Conversely, the failure to canalize the sinovaginal bulbs causes vaginal atresia. This causes the vagina to be missing or closed. It is frequently linked to syndromes like Bardet-Biedl, Fraser and MRKH syndrome and typically coexists with other developmental disorders. Vaginal atresia may not be diagnosed until adolescence. A tiny indentation or pouch where the vaginal opening should be; irregular menstruation; or cyclical stomach ache are some symptoms that affected people may experience. If menstrual blood builds up in the upper vagina, a lump may be seen on a pelvic scan. The illness is more frequently discovered throughout adolescence, particularly when menstruation hasn't begun by the age of 15, even if it is occasionally diagnosed in infancy or childhood. The diagnostic techniques may involve physical examination of the anal and vaginal region, internal reproductive tissues can be visualized using MRI or ultrasound and blood tests for genetic or chromosomal abnormalities, etc.[5-7]

Abnormal development of the urogenital sinus, which forms the lower portion of the vagina, is usually the cause of vaginal atresia. Vaginal atresia does not affect the upper reproductive organs. From total vaginal hypoplasia to blockages brought on by an imperforate hymen, transverse vaginal septum, or lower vaginal atresia, the problem can range in severity. Rarely, trauma, tumors, or inflammation can cause acquired vaginal atresia.

Diagnosis and Treatment

Imaging methods including magnetic resonance imaging, hysterosalpingography, cystoscopy and ultrasound are examples of diagnostic instruments. Treatment plans are customized based on the patient's age, the septum's location, and its thickness. Strict adherence to postoperative vaginal dilatation guidelines and routine follow-up are essential for long-term success. **Figure 1** depicted some therapeutic measures employed for the management of such types of conditions.[6-8]

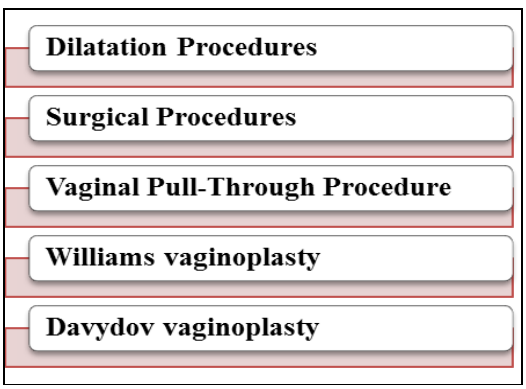

Figure 1: Various Therapeutic Measures for Congenital Gynecological Disorders.

Dilatation Procedures

In contrast to total atresia, dilation methods are seen to be the first-line treatment for milder stages of vaginal agenesis. These techniques work best when a vaginal canal extends over a superficial indentation and are based on progressive tissue growth. They are not advised, although, in situations where there is skin scarring, such as after prior surgical procedures. Intermittent self-dilation is frequently required to preserve vaginal patency even following surgical repair.

These procedures employed constant pressure while inserting a series of graduated vaginal dilators into the vaginal dimple. The possible gap between the bladder and rectum is progressively increased using this technique. This non-surgical and non-anesthetic method can be used over the course of several months. Success depends on patient cooperation and psychological support.[7-9]

Surgical Procedures

Surgery with a perineal approach is usually used to treat vaginal atresia caused by urogenital malformations, such as an imperforate hymen, transverse vaginal septum, or total lower vaginal atresia. The vaginal pull-through technique is a popular approach. Different types of vaginoplasty are subsequently taken into consideration if this method proves ineffective.

A hematocolpos, or accumulation of menstrual blood in the vagina, makes surgical repair easier. A needle may be used to aspirate the lump and verify the presence of blood under ultrasound supervision. After utilizing forceps to access the blocked area, the accumulated blood is drained, and the fibrotic tissue is removed. At the vaginal opening, the upper vaginal mucosa is pulled down and sutured to the hymeneal ring. Molds are placed in the neovagina to keep it open until complete epithelialization takes place. Digital dilatation could be required if the newly formed vagina is too small.

More severe abnormalities of the reproductive system are typically present in Type 2 vaginal atresia. The likelihood of a subsequent pregnancy is low even with effective anatomical repair, and many patients ultimately have a hysterectomy. Therefore, only when the uterus is functioning normally surgeries like vaginoplasty and cervicoplasty with reconnection to the vaginal opening can be attempted.

There are numerous surgical techniques available to create a vagina that is both functional and aesthetically pleasing. These operations employ a range of tissues, such as peritoneum, amniotic membrane, intestine segments, and split-thickness and full-thickness skin grafts. Every approach has its benefits and drawbacks, minimally invasive laparoscopic procedures have become more popular recently since they need fewer big incisions, have fewer problems, and require less recuperation time. Additionally, these reduce the risk of

rectal damage and adhesions. In these situations, robotic-assisted surgery is becoming more and more common[8-10]

- ✓ Vaginal Pull-Through Procedure is often done for transverse vaginal septum or imperforate hymen. To get to the regular vaginal canal, it entails cutting through the blocking fibrous tissue, emptying any blood that has accumulated, and drawing the healthy vaginal mucosa down to join it close to the introitus.
- ✓ William's Vaginal Surgery creates a neovagina by merging the labia majora. Despite being widely utilized at first, it lost popularity since it resulted in an extremely short vaginal canal.
- ✓ McIndoe-Reed Procedure method involves dissecting the area between the bladder and rectum and lining it with a split-thickness skin graft, usually from the buttocks, that is positioned over a mold. Despite its effectiveness, there are dangers, including the development of strictures, dryness and scarring.
- ✓ Davydov procedure lines the neovaginal area with the peritoneum, although it can be complicated by prolapse risk, discomfort, vaginal dryness and peritonitis.
- ✓ The process of producing a neovagina from a pedicled piece of the colon or ileum, with the lower end linked to the perineum, is known as intestinal vaginoplasty. Despite producing a large and self-lubricating neovagina, it necessitates a sophisticated abdomino-perineal technique and entails risks of excessive mucus production and peritonitis.

In most cases, surgical correction is postponed until the patient is old enough to follow the instructions for the required post-operative care. However, in situations where there is a possibility of developing endometriosis, substantial or painful hematocolpos resulting in vaginal blockage, or abdominal or pelvic pain, earlier intervention may be necessary. Relieving discomfort, restoring normal sexual function and maintaining fertility are the main goals of surgery. The degree and kind of atresia, any related anatomical abnormalities, the surgical team's experience, any prior surgical history, any scarring in the genital or abdominal area, and the availability of thorough post-operative and psychological support are some of the factors that affect the surgical procedure choice.[6, 8-10]

CONCLUSION

Developmental flaws in the female reproductive tract's embryological genesis lead to Mullerian malformations, such as transverse vaginal septum and vaginal atresia. When symptoms like amenorrhea, dysmenorrhea, pelvic discomfort, or dyspareunia appear in adolescence, these disorders are frequently misdiagnosed. The transverse vaginal septum, which can vary in location and severity, results from the Mullerian ducts' inadequate vertical fusion or resorption. Syndromic disorders are frequently linked to vaginal atresia, which is produced by the failure of canalization of the sinovaginal bulbs. Since prompt diagnosis and tailored treatment can help to preserve reproductive potential and enhance quality of life, early detection through clinical evaluation and imaging is crucial. Diagnostic procedures like ultrasonography, MRI, hysterosalpingography and cystoscopy are essential for detecting congenital vaginal abnormalities. Individualized management plans are developed, accounting for the patient's age and septal placement. Vaginal dilatation is still the first-line, non-surgical treatment for mild instances, although surgical reconstruction is sometimes required for complex or full atresia. Techniques such as intestinal vaginoplasty, Davydov, McIndoe-Reed and vaginal pull-through are selected according to their severity and anatomical factors. Long-term anatomical and functional success depends on postoperative care, particularly following vaginal dilatation guidelines and scheduling routine follow-up.

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