

Pediatrics

Double mucosal flap for the reconstruction of transverse vaginal septum – A novel surgical approach using the vaginal septal tissue

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1. Introduction

Transverse vaginal septum is a congenital anomaly typically undiagnosed until menarche. Although the majority of such septa occur at the junction of the middle and upper thirds of the vagina, transverse vaginal septum may be found at any vaginal level (Fig. 1). A complete transverse septum will block menstrual flow and is a cause of primary amenorrhea and hematocolpus accompanied with cyclic abdominal pain, tubo-ovarian abscess, urinary tract infection and endometriosis.

Some transverse septa are incomplete and may cause dyspareunia or obstruction in labor.¹

Transperineal, transrectal, and abdominal ultrasonography will show distended upper vagina and may be beneficial in establishing the diagnosis and for determination of the location and thickness of a transverse vaginal septum.

MRI is the gold standard for a precise diagnosis of the anomaly, determination of the depth of the vagina, identification of the thickness of the septum and the extent of the distension of the vagina, cervix, and uterus or tubes.²

Common surgical technique used to repair transverse septum is resection followed by primary end-to-end anastomosis of the lower

and upper vaginal mucosa. The major drawbacks of this technique are the high rate of ring scarring, which may lead to vaginal stenosis and obliteration, extensive scarring resulting in vaginal shortening and dyspareunia.³ High complication rate following resection of thick transverse septum mandates the need for alternative surgical technique to overcome these obstacles. In this paper we present a novel surgical technique. The principle behind this technique is



Fig. 1. Low transverse vaginal septum.

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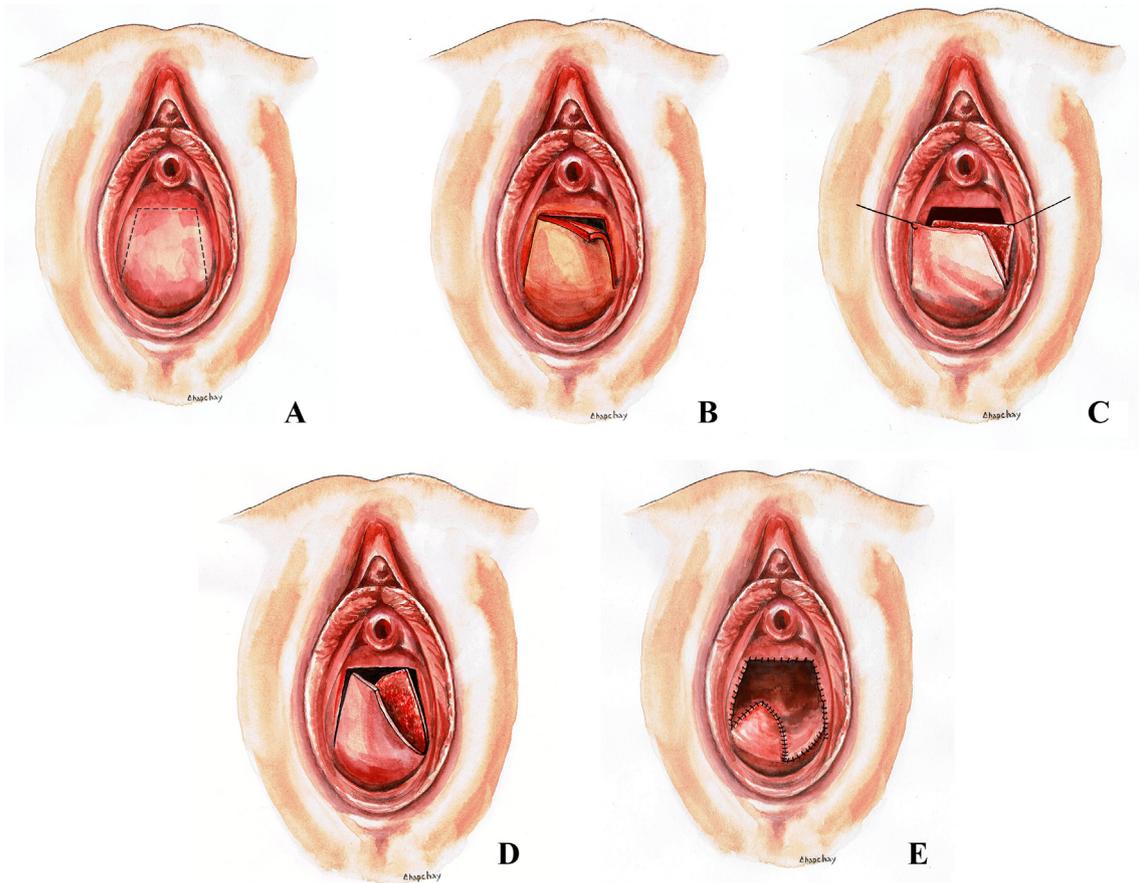


Fig. 2. Line of incision of the transverse vaginal septum (A). A horizontal incision is made at the upper part of the septum, 3–4 mm posterior the urethra meatus. From this incision two oblique incisions are made towards the lateral vaginal wall, at the 5 and 7 o'clock position in order to stay away from the rectum. Trapezoid flap is formed. The flap blood supply is based on the posterior vaginal wall, which remains intact (B). Two stay sutures at the tip of the flap (one on the proximal mucosa and the other on the distal) are placed and the flap is divided into two vaginal mucosal flaps, one from the mucosa and submucosa of the proximal septal trapezoid tissue and one from the distal part (C). The two flap leaflets, are placed one next to the other (D) and sewed (E) in order to increase the vagina circumference and length while maintaining continuity of epithelium.

rather than the removal of the septal tissue we used it to cover the vaginal gap. In this method, the septum is converted into two mucosal flaps that lie one next to the other, thereby increasing vaginal caliber and length.

2. Technique

The procedure begins with a cystoscopy to rule out any other urogenital anomalies, and ensure normal urethra, with no urethro-vaginal communication. A horizontal incision is made at the upper part of the septum (3–4 mm posterior the urethra meatus) (Fig. 2A). From this incision two oblique incisions are made towards the lateral vaginal wall, at the 5 and 7 o'clock positions in order to stay away from the rectum. A trapezoid flap is formed. The flap blood supply is based on the posterior vaginal wall, which remains intact (Fig. 2B). At this point the proximal vagina is visualized and vaginoscopy is performed in order to confirm normal vagina and cervix. After placing two stay sutures at the tip of the flap (one on the proximal mucosa and the other on the distal), the flap is divided into two vaginal mucosal flaps. One from the mucosa and submucosa of the proximal septal trapezoid tissue and the other from the distal part (Fig. 2C). After preparing the two flaps leaflets, they interdigitated and sewed to bridge a large raw surface (Fig. 2D and E) hence maintaining the continuity of the epithelium and the normal vaginal caliber and length. No dissection is performed next to the urethra at the vary anterior wall and the mucosa at this spot

remains anastomose primarily. Our experience includes three patients with follow up of 14 months. In two of the cases the vaginal septum was low and with a thickness of 3–4mm. The surgical results, from the scarring and the vagina caliber perspective were excellent. The calibers were more than two fingers, without stenosis or scarring (see Fig. 3).

3. Discussion

Incomplete fusion or canalization of the Müllerian duct with the urogenital sinus during vaginal embryogenesis, results in a transverse vaginal septum. The septum location can be in the lower, middle, or upper portions of the vagina, but is more frequent in the middle or upper third. Its thickness can vary from very thin to 5 cm. The incidence of transverse vaginal septum is 1 in 70,000 females.¹ Several surgical techniques were described in order to correct this anomaly, including simple resection with end-to-end anastomosis. In cases where the gap between the two parts of the vagina is too large for primary anastomosis, especially where the septum is very thick, the surgical technique should include grafts or flaps. When Surgical correction is planned one must establish the exact location of the septum within the vagina. Septum thickness must also be assessed. Often the obstructed vagina distended proximally providing excess of vaginal wall that may be helpful in overcoming the missing vaginal tissue after septum resection. Flap techniques like “Z”-plasty or double cross plasty (star) were describe



Fig. 3. Double mucosal flap reconstruction of the transverse vaginal septum. The two flap leaflets, are placed and sewed one next to the other. Foley silicone catheter inserted in the rectum and the balloon is inflated in order to easy the palpation of the rectum during the posterior dissection.

previously to overcome shortage of vaginal tissue.⁴ In the double cross technique, the septum may be divided into 2 parts: a distal section and a proximal section. Four triangular flaps are dissected from each section and then 8 triangular flaps of two layers are interposed, allowing the scarring along the suture line to contract the incision in a longitudinal fashion rather than a transverse one, thus, reducing the chances of vaginal stenosis.⁵ The major disadvantage of this technique is the complexity of creating multiple (eight) small flaps that may eventually lead to vascular compromise and flap contraction. Garcia et al. describes the Z Plasty, in 1967, and

the modified Z-plasty, 4 increase of the vaginal diameter as the main advantage of the Z-plasty technique. While the disadvantage is its complexity, especially in high transverse septum. Another approach described is skin graft interposed into the large defect to prevent excessive vaginal shortening. Disadvantages of this technique, includes donor site scarring and to vaginal stenosis.

We described a novel technique consist of a double-flap repair that allows bridging large gaps between the lower and the upper vagina, increases the vaginal circumference and prevents annular stenosis. The advantages of this double-flap technique are the prevention of vaginal shortening, stenosis, obstruction and recurrent hematocolpus (especially with very thick septum, where the gap between the two parts of the vagina is too large for primary anastomosis).

4. Conclusion

The technique of a double flap is simple, and can provide the main advantage of longitudinal healing of the suture line and thus reducing the chances of stenosis.

Author contribution

All authors listed, have made substantial, direct, and intellectual contribution to the work and approved it for publication.

The authors declare no competing financial or personal interests.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.eucr.2017.11.002>.

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