



ORIGINAL RESEARCH PAPER

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Z-PLASTY FOR TRANSVERSE VAGINAL SEPTUM: A CASE REPORT WITH SURGICAL RECONSTRUCTION

KEY WORDS: Transverse Vaginal Septum, Z-plasty, Müllerian Anomaly, Microperforation, Vaginal Reconstruction, Interdigital Flap, Vaginoplasty.

Dr C. Durga Devi

Associate Professor, Department of Obstetrics and Gynaecology, Government Theni Medical College, Theni, Tamil Nadu, India

Dr Vasavi

Post Graduate, Department of Obstetrics and Gynaecology, Government Theni Medical College, Theni, Tamil Nadu, India

ABSTRACT

Transverse vaginal septum (TVS) is a rare Müllerian anomaly resulting from incomplete fusion and canalization of the Müllerian ducts with the urogenital sinus, with presentation varying by septal thickness and perforation. We report a 24-year-old primigravida diagnosed intrapartum with a microperforated transverse vaginal septum who delivered by caesarean section for anticipated labor obstruction, followed by definitive Z-plasty correction with an uneventful postoperative course and good functional outcome. Z-plasty is an effective reconstructive technique that redistributes tissue, prevents contracture and maintains vaginal patency.

INTRODUCTION

Transverse vaginal septum has an incidence of approximately 1 in 30,000 to 1 in 70,000 females. Septa may be complete or perforated; microperforated septa often remain asymptomatic and can allow menstruation and even conception. Surgical correction is the definitive treatment, and among available techniques, Z-plasty offers the advantage of preventing postoperative stenosis while providing a neovagina of adequate caliber.

Case Presentation

A 24-year-old primigravida at 38+5 weeks presented in labor. Menstruation was regular with minimal flow lasting 2–3 days. On per speculum examination, a 2.5 cm blind vaginal pouch was seen with a pin-hole (≈ 2 mm) opening in the anterior vaginal wall allowing menstrual flow. Diagnosis of microperforated transverse vaginal septum was made intrapartum. She underwent emergency lower segment caesarean section and delivered a healthy male baby weighing 2.8 kg. Definitive reconstruction with Z-plasty was performed 6 weeks postpartum.

Surgical Technique and Intraoperative Findings

Step 1: Identification of the Trilaminar Septum

The transverse vaginal septum is identified as a trilaminar structure consisting of:

Lower vaginal mucosa (vaginal vault side)

Areolar connective tissue (midseptum)

Upper vaginal mucosa (cervical pocket side)

A small central sinus tract (microperforation) is visible in the middle of the septum.

Step 2: Injection and Lower Flap Incisions

POR8 (vasopressin) is injected for haemostasis. Two oblique crossed incisions are made through the lower vaginal vault mucosa, creating four triangular mucosal flaps (anterior portion of barrier). The oblique orientation of incisions ensures horizontal baselines, keeping dissection away from the bladder anteriorly and rectum posteriorly.

Step 3: Midseptal Excision

Areolar connective tissue between the two mucosal layers is carefully dissected using sharp knife dissection achieving a full-thickness disc excision of the midseptum. A urethral catheter is palpated anteriorly and a finger placed along the rectal wall posteriorly throughout this step to protect adjacent structures.

Step 4: Upper Flap Incisions

Two crossed incisions are made through the upper vaginal mucosa (cervical pocket side), creating four additional triangular mucosal flaps (posterior portion of barrier). These upper incisions are rotated 45° relative to the lower incisions, ensuring the upper and lower flap sets are offset from each

other — a critical geometric requirement for true Z-plasty interdigitation.

Step 5: Flap Mobilisation

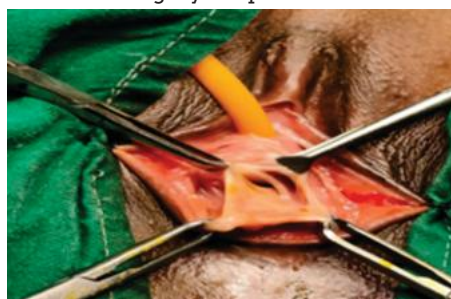
The edges of both upper and lower mucosal flap sets are undermined and sufficiently mobilised to allow tension-free anastomosis. By mobilising the areolar tissue and separating the two septal halves, an additional 0.5–1 cm of vaginal length is gained spontaneously.

Step 6: Interdigitation and Suturing (Z-Plasty)

Upper and lower flap sets are joined together in a continuous Z-plasty configuration — the apex of each flap is sutured into the basal intersection of the opposing two flaps. This interdigitation redistributes tissue, eliminates linear scar lines and prevents contracture. Interrupted single-layer delayed-absorbable sutures are used throughout.

Step 7: Vaginal Mold Insertion

A rigid plastic vaginal mold is inserted at the conclusion of surgery following local application of estriol cream. The mold is changed daily until hospital discharge. An elastic mold is then recommended for 5–8 weeks postoperatively. Sexual intercourse is permitted from the sixth postoperative week onwards. In sexually inactive patients, a silicone elastomer vaginal form is used nightly for up to 6 months.





Postoperative Course

Postoperative recovery was uneventful. Vaginal mold was inserted for 5–6 weeks along with topical estrogen application. At follow-up, the vagina was well healed with adequate caliber ($\geq$ two fingers comfortably).

DISCUSSION

Microperforated septa are particularly challenging to diagnose, as minimal menstrual flow through a tiny opening may delay presentation until adulthood or even the intrapartum period. Surgical management depends on septal location, thickness, and proximity to surrounding structures.

Z-plasty, first described by Garcia and later modified by Grünberger, uses interdigitating mucosal flaps to reduce scar contracture and maintain vaginal patency. Wierrani et al. reported excellent long-term outcomes in 13 patients treated with Z-plasty, including adequate vaginal calibre, absence of postoperative stenosis, satisfactory sexual function, and successful vaginal deliveries. The technique was found reliable for septa up to 5 cm thick, with additional vaginal length achieved through tissue mobilisation.

More recently, Yamamoto et al. described successful Y-V plasty for a low, thin microperforated septum located close to the urethral meatus. This approach minimised anterior wall dissection and reduced the risk of urethral injury while maintaining satisfactory postoperative vaginal calibre and sexual function. Emerging Y-flap techniques have also shown low rates of postoperative stenosis, particularly in septa measuring 1–3 cm.

In our case, Z-plasty was selected because the septum was moderately thick with a 2 mm central perforation, making it suitable for the interdigitating flap approach, and the postoperative mold and oestrogen regimen helped maintain patency during healing.

Current evidence supports individualised surgical planning for TVS. Thin, low septa near the urethra may be better managed with Y-V plasty, whereas moderate-thickness mid or upper vaginal septa are well suited to Z-plasty. Preoperative MRI and ultrasound assessment remain essential for defining septal anatomy and excluding associated anomalies before surgery.

CONCLUSION

Z-plasty is a simple, safe and effective technique for reconstruction of transverse vaginal septum. It provides a wide, non-stenotic vagina with excellent functional results. Early recognition and timely surgical correction are essential to optimize reproductive and sexual health.

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