

Case Report

Clinical and surgical management of congenital cervical outflow obstruction variants in adolescents

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ABSTRACT

Congenital anomalies of the uterine cervix are rare Müllerian duct development disorders that present significant management challenges. Obstruction of menstrual outflow typically leads to hematometra, causing cyclical pelvic pain and primary amenorrhea. However, presentation can vary greatly depending on uterine anatomy and collection volume. This series reports two distinct presentations of congenital cervical obstruction managed at a tertiary municipal hospital in Mumbai. Case 1 describes a 14-year-old female presenting with primary amenorrhea, severe cyclical abdominal pain, and an anatomical variant featuring a blind vaginal canal, single-sided hematometra with a contralateral rudimentary horn, massive right-sided hematosalpinx, and extensive secondary pelvic endometriosis. She successfully underwent an isthmo-vaginal anastomosis, right salpingectomy, and deposit excision. Case 2 presents a 16-year-old female with primary amenorrhea who was notably asymptomatic for cyclical pain. Pelvic MRI confirmed a subseptate uterus with two non-communicating, asymmetrical endometrial cavities containing restricted blood products, separated from the cervix by a 3–4 mm fibrous tissue band. She successfully underwent surgical resection via an isthmo-cervical anastomosis, intraoperative drainage of dual mucocoeles, and fimbrial adhesiolysis. These cases illustrate the diverse clinical spectrum of congenital cervical obstruction. While Case 1 showcases severe retrograde complications, Case 2 demonstrates that small-volume, non-communicating septate cavities can present asymptotically without cyclical distress. Meticulous multiplanar MRI evaluation and individualized reconstructive surgery are vital to preserving anatomy and long-term fertility.

Keywords: Müllerian duct anomalies, Hematometra, Primary amenorrhea, Hematosalpinx, Isthmo-vaginal /isthmo-cervical anastomosis

INTRODUCTION

Congenital cervical tract obstructions, including isolated cervical atresia, aplasia, and stenosis, result from a failure of canalization or fusion of the caudal segments of the paired paramesonephric (Müllerian) ducts during embryonic development.^{1,2} According to the American Society for Reproductive Medicine (ASRM) and European Society of Human Reproduction and Embryology (ESHRE/ESGE) classification systems,

congenital cervical dysgenesis represents one of the rarer forms of female tract anomalies, occurring in approximately 1 in 80,000 to 1 in 100,000 females.^{3,4}

The classic clinical presentation involves an adolescent entering menarche who exhibits normal secondary sexual characteristics alongside primary amenorrhea and progressive, recurrent cyclical pelvic pain secondary to trapped menstrual effluent (hematometra).^{1,5} If left unrecognized or untreated, persistent retrograde menstruation via the fallopian tubes frequently triggers

secondary reproductive sequelae, including hematosalpinx, extensive tubal architecture distortion, peritoneal adhesions, and advanced endometriosis.^{5,6}

However, when congenital cervical obstructions coexist with complex internal septations or rudimentary cavities, the rate of endometrial proliferation and luminal distension varies considerably, leading to atypical or silent presentations.^{3,7} Multiplanar magnetic resonance imaging (MRI) is widely recognized as the gold-standard imaging modality for accurately defining these complex junctional and uterovaginal relationships.⁸ This case series contrasts two distinct presentations of congenital cervical obstruction, underscoring their phenotypic diversity, diagnostic nuances, and tailored reconstructive surgical approaches.

CASE REPORT

Case 1

Complex Cervical Agenesis with Unilateral Müllerian Anomaly and Secondary Endometriosis

Clinical presentation and history

Patient Profile included a 14-year-old unmarried female presented to the Department of Obstetrics and Gynaecology at Dr. R.N. Cooper Municipal General Hospital, Mumbai.

The chief complaints were primary amenorrhea accompanied by a 4-month history of lower abdominal pain that had become continuous over the preceding 3 days. No prior surgical or significant medical history reported.

Physical and gynaecological examination

General and abdominal examination showed that vital signs were stable; secondary sexual characteristics were appropriately developed. Abdomen was soft but tender in the suprapubic area.

Local and Pelvic Examination showed normal external genitalia with an intact annular hymen. Digital vaginal examination revealed a blind vaginal canal with no palpable cervix or bulge, indicating upper tract obstruction.

Diagnostic evaluation

Laboratory workup showed that the baseline laboratory profiles were normal, including a full endocrine panel (TSH, Prolactin, FSH, LH, T3, and T4).

Imaging findings especially the pelvic MRI showed contrast-enhanced pelvic. MRI revealed a markedly distended endometrial canal (~3.2 cm maximum thickness) exhibiting T1 hyperintensity and T2 hypo

intensity, consistent with a large hematometra secondary to severe cervical stenosis. The right fallopian tube was dilated (4.3×3.6 cm) with haemorrhagic contents, confirming a substantial right hematosalpinx. Both ovaries were normal with physiological follicular cysts.

Intraoperative findings

Exploratory laparotomy confirmed complete cervical agenesis and a blind vaginal canal. A distended blind uterine cavity was identified alongside extensive fundal and peritoneal endometriotic deposits. A large right-sided hematosalpinx was noted (Figure 1). A rudimentary uterine bud was present on the left side, to which a morphologically normal left fallopian tube and ovary were attached. (Figure 2). The right ovary was morphologically normal.



Figure 1: Distended blind uterine cavity with large right-sided hematosalpinx.



Figure 2: Rudimentary uterine bud with morphologically normal left fallopian tube and ovary.

Surgical intervention & reconstruction

Drainage and access included dissection of the bladder fascia inferiorly to isolate the uterine isthmus, which was incised to drain thick hematometra fluid. Concurrently, the blind vaginal vault was opened centrally from below and calibrated with dilators.

In reconstruction, isthmo-vaginal anastomosis was performed by suturing the anterior and posterior margins of the uterine isthmus to the corresponding margins of the vaginal vault using delayed-absorbable sutures.

Auxiliary procedures and haemostasis included a right salpingectomy and excision of peritoneal endometriotic nodules. Internal iliac artery ligation was executed to ensure haemostasis.

Stenting Protocol included a paediatric Foley catheter (No. 14, bulb inflated to 3 ml) was placed transvaginally across the neocanal into the uterine cavity as a healing stent (Figure 3).

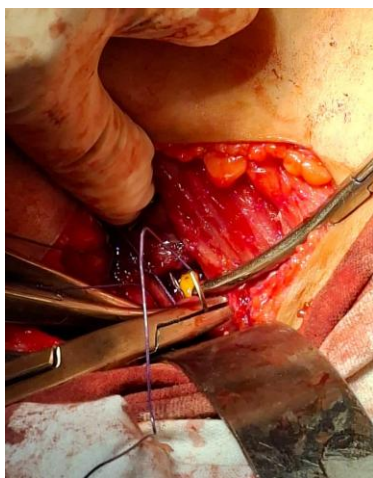


Figure 3: Paediatric Foley catheter (No. 14, bulb inflated to 3 ml) placed transvaginally across the neocanal into the uterine cavity

Post-operative outcome and follow-up

The post-operative recovery was uneventful. The transvaginal stent was serially deflated and removed completely on post-operative day 14. The patient was discharged in stable condition, pain-free, and scheduled for routine outpatient tracking.

Case 2

Asymptomatic Obstructive Subseptate Uterus with Fibrous Cervical Atresia

Clinical presentation and history

Patient profile included a 16-year-old unmarried female presented to the outpatient department at Dr. R.N. Cooper Municipal General Hospital, Mumbai.

Chief Complaints were primary amenorrhea. The patient explicitly denied any history of cyclical lower abdominal pain, monthly pelvic distress, or palpable masses. Past medical, surgical, and familial histories were completely unremarkable.

Physical and gynaecological examination

The general and abdominal examination showed stable condition (Blood Pressure: 120/80 mmHg, Afebrile). Secondary sexual characteristics were fully developed matching adolescent milestones. Abdominal palpation was non-tender with no masses.

Local and pelvic examination showed anatomically present lower cervix and vagina that appeared normal for her age.

Diagnostic evaluation

Laboratory Workup showed that routine biochemistry parameters and full endocrine panel (TSH, Prolactin, FSH, LH, T3, and T4) were normal.

Ultrasonography (USG) of the abdomino-pelvic demonstrated an anteverted uterus (5.7×2.2×3.8 cm) with hyperechoic luminal contents bifurcating towards the fundal region, raising suspicion for a septate or duplicated cavity. Ovaries were normal (~3 cc volume each).

Imaging findings (Pelvic MRI): Dedicated multiplanar contrast MRI revealed a retroverted uterus with a smooth, normal external fundal contour. Internally, two small, asymmetrical endometrial cavities were separated by a thin fibrous septum. Both cavities contained restricted blood products (hematometra), with the larger right collection measuring 18×16×18 mm. A 3–4 mm dense fibrous tissue band was identified between the lower uterine segment and the cervix, confirming localized cervical atresia without pelvic free fluid or adnexal masses.

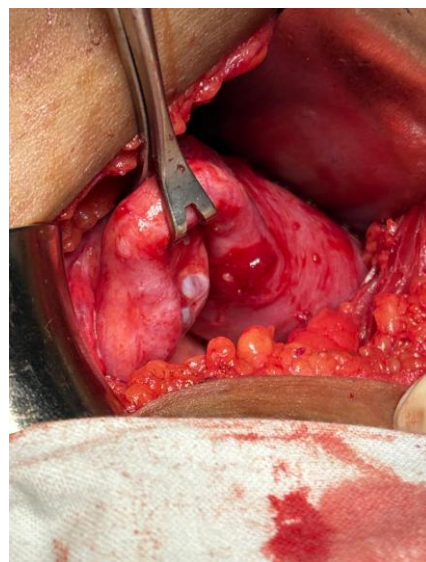


Figure 4: Enlarged uterus with a normal external fundal contour. Bilateral fallopian tubes notably thickened, heavily fibrosed with blocked fimbrial ends.

Intraoperative Findings showed that the overall uterine size was enlarged with a normal external fundal contour. Bilateral fallopian tubes were notably thickened, heavily fibrosed, and had blocked fimbrial ends (Figure 4). Bilateral ovaries, bowel, and bladder structures were normal.

Surgical intervention and reconstruction

Drainage and access were done under general anaesthesia, initial serial dilatation of the anatomically present cervix was performed from below (Figure 5). Via a Pfannenstiel abdominal approach, a horizontal incision was made across the uterine isthmus to expose and excise the dense transverse septum, draining retained old blood/mucous matrix (dual mucoceles).

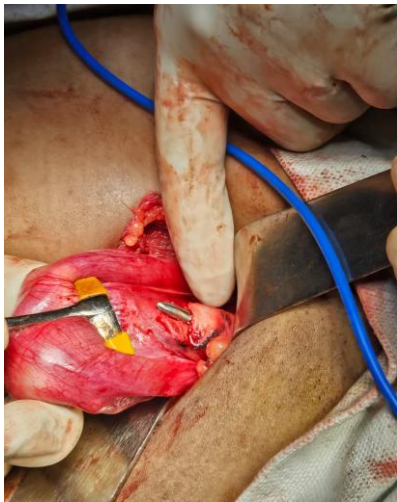


Figure 5: Serial dilatation of the anatomically present cervix.

Reconstruction included an isthmo-cervical anastomosis was constructed, establishing communication between the

unified lower uterine segment and the cervical canal, followed by interrupted suture closure.

The auxiliary procedures and haemostasis included bilateral fimbrial adhesiolysis, which was performed to address fimbrial occlusion. Complete abdominal haemostasis was confirmed prior to layer closure.



Figure 6: Dual paediatric Foleys catheters were introduced across the canal—one into each endometrial cavity.

Stenting Protocol included a dual paediatric Foley catheters were introduced across the canal—one into each endometrial cavity—with each balloon inflated to 1 cc of Normal Saline to maintain tract patency and prevent intra-cavitary adhesions (Figure 6).

Post-operative outcome and follow-up

Post-operative recovery was uneventful. Both intra-cavitary stents were deflated and removed completely on post-operative day 7. The patient was discharged in stable condition, pain-free, and scheduled for routine outpatient tracking.

Table 1: The knowledge about the disease caused by dog bite (n=111).

Clinical Feature	Case 1	Case 2
Age	14 Years	16 Years
Primary Symptom	Primary amenorrhea with severe cyclical pain	Isolated primary amenorrhea; completely asymptomatic for pain
External Uterine Contour	Abnormal with left uterine bud anomaly	Smooth, normal external fundal contour
Internal Structural Layout	Single functional cavity	Subseptate configuration with dual asymmetrical cavities
Obstruction Anatomy	Absence of cervical canal with a blind vagina and blind uterine cavity	3–4 mm dense fibrous band at lower uterine segment with cervical atresia
Fluid Presentation	Marked hematometra causing 3.2 cm cavity distension	Minimal/Restricted (18×16×18 mm)
Secondary Tubal Pathology	Large right hematosalpinx (4.3×3.6 cm)	Bilateral thickened, fibrosed tubes with sealed fimbria
Reconstructive Strategy	Isthmo-vaginal Anastomosis	Isthmo-cervical Anastomosis
Splinting Protocol	Single Paediatric Foley Catheter (3 mL bulb)	Dual Paediatric Foley Catheters (1 cc bulbs each)

DISCUSSION

Congenital cervical outflow tract obstructions are among the most anatomically intricate anomalies of the Müllerian system.^{1,3} Comparative analysis of these two cases illustrates how identical obstruction levels (the cervico-isthmic junction) can manifest as entirely divergent clinical phenotypes depending on coexisting uterine structural morphology.

The most striking divergence is Case 2's total absence of cyclical abdominal or pelvic pain, a symptom typically regarded as the hallmark diagnostic indicator in paediatric and adolescent gynaecology.^{1,9} Pathophysiologically, acute and cyclical pain correlates with rapid myometrial stretch and acute peritoneal irritation from transtubal retrograde reflux of menstrual blood.^{6,10} In Case 1, a single, large, functioning endometrial cavity generated standard monthly menstrual volumes against an absolute outflow block, precipitating acute cavity distension, high intracavitary pressures, hematosalpinx, and severe secondary pelvic endometriosis—a classic progression of Sampson's retrograde menstruation theory.^{10,11}

In contrast, Case 2 possessed a subseptate configuration that created two tiny, isolated functional compartments. The restricted surface area of endometrium produced diminutive volumes of menstrual fluid that failed to generate the wall tension required to trigger visceral pain receptors.^{9,12} Nevertheless, this low-pressure, insidious retrograde percolation over several years proved sufficient to cause bilateral tubal fibrosis and fimbrial sealing. This demonstrates that an absence of symptoms does not preclude progressive tubal and pelvic parenchymal damage.^{6,7}

Historically, total hysterectomy was frequently advocated as the definitive management for cervical atresia due to high rates of recurrent stenosis, ascending pelvic sepsis, and poor fertility outcomes.^{2,13} However, modern paediatric and adolescent reproductive surgery emphasizes organ preservation, fertility preservation, and restorative uterovaginal or uterocervical continuity.^{13,14}

The choice of surgical technique is dictated by the precise anatomical subtype such as isthmo-vaginal Anastomosis, which is indicated when the cervical body is entirely absent or aplastic (Case 1), bridging the functional uterine corpus directly to the mobilized vaginal vault.^{14,15}

The other is isthmo-cervical anastomosis which is indicated in segmental atresia where an intact cervical cylinder and external os exist distal to a fibrous obstruction (Case 2), preserving natural cervical stroma and the anatomical external os.^{13,15}

The utilization of intraoperative splints or stents remains critical to prevent postoperative cervical canal re-stenosis and hematometra recurrence.^{14,16} While single-balloon

silicone or Foley catheters suffice for uniform cavities, placing dual paediatric Foley stents—is implemented in Case 2—represents an effective strategy to independently maintain patency in bifurcated or septate cavities, preventing cross-septal synechiae during the critical mucosal re-epithelialization phase.^{15,17}

CONCLUSION

Adolescent reproductive tract obstructions possess a diverse structural and clinical spectrum. While severe cyclical pain and pelvic endometriosis are classic hallmarks of cervical stenosis, clinicians must remain vigilant when evaluating isolated primary amenorrhea without pain. An obstructive, subseptate uterine variant can mask classical symptoms due to low-volume fluid accumulation. Comprehensive multiplanar pelvic MRI is the optimal choice for detailing fibrous obstructions, ensuring timely anatomical reconstruction, protecting future fertility, and preventing secondary adnexal damage.

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REFERENCES

1. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 779: management of obstructive cervical and vaginal anomalies in adolescents. *Obstet Gynecol*. 2019;133(6):e363–71.
2. Rock JA, Jones HW Jr. Te Linde's operative gynecology. 11th ed. Philadelphia: Wolters Kluwer; 2015. Chapter 27, Surgical conditions of the cervix and congenital anomalies.
3. Pfeifer SM, Attaran M, Gorrill MJ, et al. ASRM Müllerian anomalies classification 2021. *Fertil Steril*. 2021;116(5):1238–52.
4. Grimbizis GF, Gordts S, Di Spiezo Sardo A, et al. The ESHRE/ESGE consensus on the classification of female genital tract congenital anomalies. *Hum Reprod*. 2013;28(8):2032–44.
5. Hoffman BL, Schorge JO, Halvorson LM, Hamid CA, Corton MM, Schaffer JI. Williams gynecology. 4th ed. New York: McGraw-Hill Education; 2020. Chapter 18, Congenital uterovaginal anomalies.
6. Sanfilippo JS, Smith YR. Physiology of menarche and obstructive anomalies. In: Sanfilippo JS, Lara-Torre E, editors. *Pediatric and adolescent gynecology: evidence-based clinical practice*. Malden: Blackwell Publishing; 2008. p. 112–29.
7. Roberts CP, Rock JA. Surgical approaches to congenital anomalies of the cervix. *Curr Opin Obstet Gynecol*. 2011;23(4):251–7.
8. Troiano RN, McCarthy SM. Müllerian duct anomalies: imaging and clinical issues. *Radiology*. 2004;233(1):19–34.

9. Edmonds DK. Congenital malformations of the genital tract and their management. *Best Pract Res Clin Obstet Gynaecol*. 2003;17(1):19–40.
10. Sampson JA. Peritoneal endometriosis due to the menstrual dissemination of endometrial tissue into the peritoneal cavity. *Am J Obstet Gynecol*. 1927;14(4):422–69.
11. Olive DL, Pritts EA. Treatment of endometriosis. *N Engl J Med*. 2001;345(4):266–75.
12. Berek JS, Berek DL. *Berek & Novak's gynecology*. 16th ed. Philadelphia: Wolters Kluwer; 2020. Chapter 20, Müllerian and vaginal anomalies.
13. Rock JA, Roberts CP, Jones HW Jr. Congenital anomalies of the uterine cervix: lessons from 30 cases managed operatively. *Fertil Steril*. 2010;94(5):1858–63.
14. Deffarges JV, Haddad B, Musset R, Paniel BJ. Utero-vaginal anastomosis in women with uterine cervix atresia: long-term follow-up and fertility results. *Hum Reprod*. 2001;16(8):1722–5.
15. Fedele L, Bianchi S, Frontino G, Ciappina N, Fontana E, Borruto F. Laparoscopically assisted uterovaginal anastomosis in patients with cervical aplasia and a normal uterus. *Fertil Steril*. 2008;89(1):212–6.
16. Falcone T, Hurd WW. *Clinical reproductive medicine and surgery: a practical guide*. 3rd ed. Cham: Springer; 2017. Chapter 15, Müllerian anomalies.
17. Mikos T, Grimbizis GF. Surgical correction of obstructive cervical anomalies: preservation of fertility. *J Pediatr Adolesc Gynecol*. 2018;31(2):98–105.

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