

Massive Hematocolpos Secondary to Imperforate Hymen in A 15-Year-Old Adolescent

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Abstract—Background: Imperforate hymen is an uncommon congenital obstructive anomaly of the distal female genital tract that may remain clinically silent until puberty. Once menstrual cycling begins, retained blood can progressively distend the vagina, resulting in hematocolpos and, in advanced cases, a substantial abdominopelvic mass. Delayed recognition may expose adolescents to recurrent pain, urinary or bowel compression, infection, endometriosis and avoidable diagnostic procedures. **Case presentation:** This case was managed at Marwa Fertility Center, Mogadishu, Somalia, a major reproductive and gynecology center that provides fertility treatment and general gynecologic services. A 15-year-old girl presented with primary amenorrhea, recurrent cyclical abdominal pain lasting four to five days at approximately monthly intervals, and a 10-day episode of acute abdominal pain. She had no gastrointestinal or urinary complaints and no significant medical or surgical history. Secondary sexual characteristics were well developed (Tanner stage IV). Abdominal examination revealed a slightly tender midline lower-abdominal mass approximating a 25-week gravid uterus. Perineal examination showed an intact hymen and a 6 × 6 cm bulging membrane posterior to the urethra, accentuated by Valsalva manoeuvre, establishing the diagnosis of imperforate hymen with massive hematocolpos. **Intervention and outcome:** After written consent for surgery, urethral catheterization and hymenotomy were performed under general anaesthesia. A central incision was extended in a cruciate fashion, approximately 1,500 mL of thick, tarry old menstrual blood was evacuated, redundant hymenal tissue was excised, and the mucosal edges were everted and sutured. Culture showed no growth. The abdominal mass resolved immediately, recovery was uncomplicated, and the patient was discharged the following day. At six-week follow-up, normal menstrual flow had commenced.

Conclusion: Primary amenorrhea with cyclic pain in a pubertally developed adolescent should prompt deliberate assessment for genital outflow obstruction, including respectful external genital examination. This case demonstrates that a clinically straightforward congenital anomaly can progress to massive hematocolpos when recognition is delayed, while timely definitive hymenal surgery can restore menstrual outflow with a favorable short-term outcome.

Index Terms—Imperforate hymen; hematocolpos; primary amenorrhea; adolescent gynecology; hymenotomy; genital outflow obstruction; case report.

HIGHLIGHTS

- A 15-year-old with normal pubertal development presented with primary amenorrhea, cyclic pain and a large abdominal mass.
- External genital examination revealed a bulging imperforate hymen and clinically established the cause of outflow obstruction.
- Cruciate hymenotomy drained approximately 1,500 mL of retained old menstrual blood with immediate disappearance of the abdominal mass.
- Recovery was uncomplicated and normal menstrual flow was documented at six weeks.
- The case reinforces the diagnostic value of careful menstrual history and perineal examination in adolescent abdominal pain.

CLINICAL SIGNIFICANCE

The principal contribution of this case is not a novel operation but the demonstration of how a readily treatable congenital obstruction can progress to massive hematocolpos when the diagnostic triad of

primary amenorrhea, cyclic pain and normal pubertal development is not acted upon early. The unusually large retained volume and 25-week-size abdominal mass make the case educational for clinicians working across outpatient, emergency and adolescent-gynecology settings. The report also adds institutionally grounded evidence from Mogadishu to the still limited literature on adolescent genital outflow obstruction in Somalia and the wider East African region.

I. INTRODUCTION

Imperforate hymen is a congenital failure of hymenal canalization that creates complete distal vaginal outflow obstruction. Although it is often described as the most common obstructive anomaly of the female genital tract, it remains uncommon in absolute terms; published estimates generally place its frequency between approximately 0.05% and 0.1% of females. The lesion may be recognized in infancy when secretions produce hydrocolpos, but many affected girls remain asymptomatic until menarche, when cyclic endometrial shedding begins without an egress pathway. Progressive accumulation of menstrual blood initially distends the vagina (hematocolpos) and may extend into the uterus (hematometra or hematometrocolpos). [3,5]

The classic adolescent presentation is conceptually straightforward: normal secondary sexual development, absent menses, and recurrent cyclic lower abdominal or pelvic pain. Nevertheless, delayed diagnosis remains well documented. The accumulated blood may present as a pelvic or lower-abdominal mass and can mechanically compress the bladder, urethra, ureters or rectum, producing urinary retention, dysuria, hydronephrosis, constipation, tenesmus or renal dysfunction.

The presentation may therefore be misattributed to gastrointestinal, urinary, surgical or nonspecific causes unless the menstrual history and external genital examination are integrated into the initial assessment. Posner and Spandorfer showed that older girls diagnosed late were markedly more likely to be symptomatic and to undergo ancillary testing than children identified earlier, underscoring the preventable morbidity associated with missed examination findings. [7]

Diagnosis is primarily clinical. A tense, bulging hymenal membrane, often with a dark or bluish appearance from retained blood, strongly supports imperforate hymen. Current gynecologic guidance emphasizes complete abdominal and perineal examinations and recommends ultrasonography to document hematocolpos when required. When anatomy is uncertain or a more proximal obstructive anomaly is suspected, magnetic resonance imaging can help distinguish an imperforate hymen from distal vaginal atresia, transverse vaginal septum, cervical atresia, obstructed uterine horn or other Müllerian anomalies. [3,4]

Definitive management aims to establish a durable vaginal outlet while minimizing infection, recurrence and injury to the urethra or surrounding mucosa. Standard techniques use a cruciate, U-shaped or circumferential hymenal incision or excision; adequate removal of redundant tissue and mucosal approximation reduce the risk of re-adhesion. Simple needle aspiration or limited incision and drainage is discouraged because reclosure and ascending infection can occur. [3,8]

The present case describes a 15-year-old adolescent with primary amenorrhea, monthly cyclic abdominal pain and an acute 10-day pain episode who was found to have a 25-week-size lower-abdominal mass and a 6 × 6 cm bulging imperforate hymen. Approximately 1,500 mL of old retained menstrual blood was evacuated at hymenotomy, followed by uncomplicated recovery and normal menstruation at six weeks. The report is structured according to CARE principles, emphasizing transparent chronology, diagnostic reasoning, intervention and outcome. [1,2] The case was managed at Marwa Fertility Center in Mogadishu, Somalia. Recent peer-reviewed research has identified Marwa Fertility Center as one of the major reproductive and gynecology centers in Mogadishu and documents that the facility provides both fertility treatment and general gynecologic services. [19] Within Somalia, the center functions as a leading specialized reproductive-health provider with a broad referral catchment; institutional service experience also includes patients from the wider East African region. This setting is clinically relevant because specialized reproductive-health facilities may serve as important referral points not only for infertility care, but also for congenital gynecologic conditions, primary amenorrhea and complex

adolescent presentations that require focused examination and timely surgical management.

OBJECTIVE

To report the clinical presentation, diagnostic reasoning, operative management and short-term outcome of massive hematocolpos secondary to imperforate hymen, and to contextualize the case within contemporary adolescent-gynecology guidance and recent international literature.

II. CASE PRESENTATION

2.1 Clinical setting and institutional context

This case was evaluated and treated in the Department of Obstetrics and Gynaecology at Marwa Fertility Center, Mogadishu, Somalia. The center is a specialized reproductive-medicine and gynecology facility and has been identified in recent peer-reviewed literature as one of the major reproductive and gynecology centers in Mogadishu, providing both fertility treatment and general gynecologic services. [19] The institution serves a wide referral population from Somalia and, according to its clinical service experience, also receives patients from the broader East African region. For a case report, this institutional context is relevant because it demonstrates the role of a high-volume specialized reproductive-health setting in recognizing and managing adolescent congenital genital outflow obstruction alongside its broader fertility and gynecology services.

2.2 Patient information and presenting concerns

A 15-year-old girl presented with failure to attain menarche, recurrent cyclical abdominal pain lasting approximately four to five days at intervals of about one month, and acute abdominal pain that had persisted for 10 days before presentation. The pain was not associated with nausea, vomiting or diarrhoea. She denied altered bowel habits and had no urinary complaints. There was no documented significant past medical or surgical history.

The coexistence of primary amenorrhea and regularly recurring cyclic pain was clinically important because it suggested ongoing ovulatory/endometrial cyclicity despite absent external menstrual flow. In an adolescent with developed secondary sexual characteristics, this pattern raises concern for genital outflow obstruction and makes an anatomic cause

more likely than isolated constitutional delay of puberty.

2.3 General and systemic examination

At examination, the patient was alert, conscious, oriented and cooperative. She was described as of average build and fairly nourished. Vital signs were normal and she was afebrile. Systemic examination was documented as normal. Secondary sexual characteristics were well developed, with breast and pubic-hair development at Tanner stage IV, supporting normal estrogenization and making the absence of menarche more clinically significant.

2.4 Abdominal examination

A large lower mid-abdominal mass was palpable, approximating the uterine size expected at 25 weeks of pregnancy. The mass was slightly tender, dull to percussion and transmitted a fluid thrill. These characteristics favored a large fluid-containing pelvic structure rather than a solid abdominal tumor. In the context of primary amenorrhea and cyclical pain, distension of the vagina by retained menstrual blood was a strong diagnostic consideration.

2.5 Perineal examination

Examination of the external genitalia revealed generalized bulging of the perineum. The hymen was intact. A 6 × 6 cm bulging membrane was visualized posterior to the urethra; it was non-tender and became more prominent during the Valsalva manoeuvre. The labia majora were normal, while the labia minora appeared fused with the bulging membrane. The examination was consistent with an imperforate hymen associated with massive hematocolpos.

Table 1. Key clinical findings and diagnostic interpretation

Domain	Documented finding	Clinical interpretation
Menstrual history	No menarche at age 15	Primary amenorrhea requiring evaluation
Pain pattern	4–5 days of cyclic abdominal pain at ~monthly intervals	Suggests occult menstrual cycling with obstructed outflow
Acute symptoms	10 days of acute abdominal pain	May reflect increasing distension/pressure from retained blood

Pubertal status	Breast and pubic hair Tanner IV	Normal estrogenization; supports structural outflow obstruction
Abdominal exam	Midline mass $\approx$ 25-week gravid uterus; fluid thrill	Large fluid-containing abdominopelvic structure
Perineal exam	Intact 6 $\times$ 6 cm bulging membrane posterior to urethra; Valsalva accentuation	Characteristic of imperforate hymen with hematocolpos

III. DIAGNOSTIC ASSESSMENT AND DIFFERENTIAL DIAGNOSIS

The diagnosis was established clinically from the convergence of four findings: primary amenorrhea, recurrent cyclic pain, normal secondary sexual development and a bulging intact hymenal membrane. The large fluid-like abdominal mass provided evidence of substantial retained content. In this setting, the most parsimonious diagnosis was imperforate hymen causing massive hematocolpos. The case record does not document preoperative ultrasonography, laboratory testing or cross-sectional imaging; therefore, none is inferred here.

This clinical approach is concordant with contemporary guidance. When a bulging hymen is directly visualized and hematocolpos is demonstrated clinically or by ultrasonography, the diagnosis is usually straightforward. Imaging becomes particularly important when the distal anatomy cannot be confidently defined, when the hymenal appearance is atypical, or when a transverse vaginal septum, distal vaginal atresia, cervical obstruction, duplicated tract or obstructed uterine horn is suspected. [3,4]

3.1 Differential diagnosis

The differential diagnosis of primary amenorrhea with cyclic pain must remain broader than imperforate hymen until the level of obstruction is identified. The principal alternatives include a transverse vaginal septum, distal vaginal atresia, cervical atresia, obstructed hemivagina, vaginal agenesis with a functioning uterus, and non-obstructive causes of primary amenorrhea. Acute abdominal or pelvic masses may also prompt consideration of ovarian

torsion, adnexal masses, pregnancy-related pathology, urinary retention, appendiceal disease and gastrointestinal conditions. In this patient, however, the visible intact bulging hymen was the decisive finding.

Table 2. Differential diagnosis for primary amenorrhea with cyclic pain and a pelvic mass

Condition	Expected distinguishing features	Relevance to this case
Imperforate hymen	Bulging hymenal membrane; retained blood in vagina; normal pubertal development	Strongly supported by direct perineal examination
Transverse vaginal septum	Obstruction located proximally; hymenal opening may be normal; MRI often useful	Less likely because hymen itself was intact and bulging
Distal vaginal atresia	Pink mucosa/absent distal canal rather than typical bluish hymenal membrane	Clinical appearance favored hymenal obstruction
Cervical atresia	Normal distal vagina/hymen; hematometra more prominent	Not consistent with bulging imperforate hymen
Obstructed hemivagina	Often uterine duplication; unilateral hematocolpos; renal anomalies may coexist	No such features documented
Müllerian agenesis	Primary amenorrhea with normal secondary sexual characteristics but absent uterus; no cyclic retained menses	Large retained fluid mass and imperforate hymen argue against
Pregnancy/adnexal mass	Different history/examination; no bulging imperforate hymen as causal lesion	Perineal findings provided a direct anatomic explanation

3.2 Diagnostic reasoning

The educational value of this case lies in the diagnostic sequence. The menstrual history localized the problem to menstruation; Tanner IV development indicated that puberty had progressed; abdominal palpation demonstrated the magnitude of retained fluid; and external genital examination identified the level of obstruction. This sequence illustrates why genital

examination should not be omitted in an adolescent with primary amenorrhea and recurrent pelvic pain, even when the patient has no urinary or bowel symptoms.

IV. THERAPEUTIC INTERVENTION

4.1 Preoperative preparation

After the diagnosis, the patient was taken for surgery following written informed consent for the procedure. Urethral catheterization was performed before the hymenal incision. This step has practical value because it identifies and protects the urethra during surgery on a markedly distended hymenal membrane, especially when local anatomy is distorted by a large hematocolpos. [3]

4.2 Operative technique

Hymenotomy was performed under general anaesthesia. A stab incision was made centrally in the imperforate hymen and then extended in a cruciate fashion. The hymenal tissue was described as thick and tough. Approximately 1,500 mL of thick, tarry-colored old menstrual blood was drained from the vagina. Redundant hymenal flaps were excised, and the cut margins were everted by suturing the inner vaginal mucosa to the external vestibular mucosa.

The operation accomplished the key objectives of definitive treatment: decompression of the obstructed vagina, creation of an adequate patent outlet, removal of redundant tissue that might re-adhere, and mucosal edge approximation. This is consistent with standard surgical principles described in adolescent gynecology guidance, which favors a cruciate or U-shaped incision with excision of redundant hymenal tissue and absorbable mucosal suturing rather than simple puncture or limited drainage. [3,8]

4.3 Immediate intraoperative response

As the retained contents were evacuated, the abdominal mass disappeared and the abdominal enlargement subsided. This immediate response confirmed that the mass was caused by distension of the obstructed vaginal compartment rather than an independent abdominal lesion. The large drained volume also illustrates the degree to which hematocolpos may accumulate gradually in adolescents who menstruate internally for multiple cycles before diagnosis.

Table 3. Operative and perioperative management

Step	Case-specific action	Rationale/ interpretation
Consent	Written informed consent obtained for surgery	Required for operative management; publication consent is separate
Urethral protection	Urethral catheterization before incision	Defines urethral location and reduces risk of injury
Hymenal opening	Central stab incision extended cruciately	Creates controlled drainage and access
Decompression	~1,500 mL thick old menstrual blood evacuated	Relieves mass effect and confirms hematocolpos
Definitive tissue management	Redundant flaps excised; mucosal edges everted and sutured	Promotes durable patency and lowers reclosure risk
Microbiology	Vaginal fluid culture: no growth	No microbiologic evidence of infection in sampled fluid
Postoperative care	Antibiotics; perineal hygiene; catheter removed after ambulation	Supports infection prevention, local care and early mobilization

4.4 Postoperative care

The patient received antibiotics and perineal hygiene was maintained. The urinary catheter was removed once she could ambulate. The record describes an uneventful postoperative period. Although antibiotic practices vary by institution and operative context, the broader principles after hymenal surgery include maintaining local cleanliness, monitoring for fever, increasing pain, bleeding or urinary difficulty, and ensuring that the newly created opening remains patent. [3,4]

V. OUTCOME AND FOLLOW-UP

The patient remained clinically stable after surgery and was discharged on the following day in satisfactory condition. No immediate postoperative

complication was documented. The disappearance of the abdominal mass following evacuation of the hematocolpos provided an objective clinical marker of successful decompression.

At six-week follow-up, the patient had started experiencing normal menstrual flow. Restoration of

menstruation after correction of the distal obstruction is the expected functional outcome and provides evidence that the created hymenal opening remained patent during early follow-up. The source record does not report recurrent pain, infection, reclosure, urinary symptoms or other adverse events at that visit.

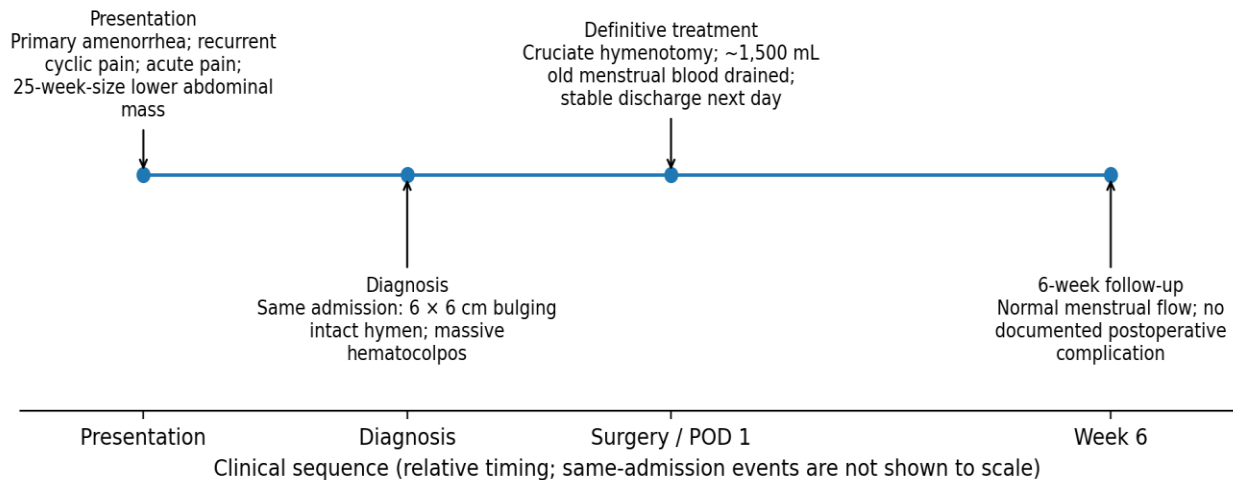


Figure 1. Clinical timeline from presentation to six-week follow-up.

Figure explanation: The timeline emphasizes the rapid clinical transition from chronic occult outflow obstruction to definitive decompression. Presentation and surgery occurred during the same episode of care, discharge followed on postoperative day 1, and normal menstrual flow was documented at six weeks. Exact calendar dates were not present in the source case record, so the figure uses relative timing and does not imply a precise interval between outpatient assessment and surgery.

5.1 Outcome assessment

Outcome assessment was favorable across the principal short-term domains documented in the source record. Anatomically, decompression of the massively distended vagina produced immediate disappearance of the abdominal mass. From an early safety perspective, no perioperative complication was documented, and the patient was discharged the following day in stable condition. Microbiologically, culture of the drained vaginal fluid showed no growth. Functionally, normal menstrual flow had commenced by the six-week review, indicating restoration of a patent menstrual outflow tract.

Longer-term outcomes were not available in the source record. Accordingly, this report does not infer

subsequent rates of dysmenorrhea, hymenal reclosure or stenosis, endometriosis-related symptoms, sexual function or future fertility. These outcomes require longer follow-up and should be reported only if supported by documented clinical review.

5.2 Follow-up considerations

Because hymenal restenosis and adhesions are uncommon but recognized, follow-up should confirm continued patency and symptom resolution. Adolescents with persistent or recurrent pelvic pain after correction of an obstructive anomaly should also be assessed for endometriosis or a more proximal anatomic abnormality. [3,11] The short-term course in this case was favorable; however, the six-week observation period does not establish long-term reproductive outcomes.

VI. DISCUSSION

6.1 Embryologic and pathophysiologic context

The hymen forms at the junction of the urogenital sinus and the developing vaginal canal. In normal development, central epithelial degeneration establishes a patent vaginal introitus, leaving a variable rim of hymenal tissue. Failure of complete

canalization results in an imperforate hymen. Unlike many Müllerian anomalies, imperforate hymen is usually an isolated distal obstructive lesion, although clinicians must still assess anatomy carefully when the examination is atypical. [3,5]

Before puberty, the obstruction may be clinically silent because there is little vaginal content to retain. After menarcheal physiology begins, each cycle contributes additional blood to the obstructed vagina. The resulting hematocolpos acts as a progressively enlarging pelvic reservoir. Proximal extension can produce hematometra and occasionally hematosalpinx. Mechanical effects depend on the direction and degree of distension: anterior compression may impair bladder emptying or ureteric drainage, posterior compression may produce constipation or tenesmus, and superior expansion may generate a palpable abdominal mass. [5,6]

In this patient, the absence of urinary or bowel symptoms despite a mass approximating a 25-week gravid uterus is notable. It demonstrates that symptom severity does not always correlate directly with retained volume. Her dominant symptom pattern was gynecologic—primary amenorrhea with repetitive monthly pain—followed by a longer acute pain episode. The retained volume of approximately 1,500 mL is substantially larger than the several-hundred-milliliter volumes described in many contemporary reports, supporting the descriptor “massive hematocolpos.”

6.2 Why diagnosis may be delayed

Imperforate hymen is potentially detectable by routine external genital inspection well before menarche, yet delayed recognition is recurrent in the literature. Several factors contribute: adolescents may not volunteer menstrual concerns; cyclic pain may be normalized or treated symptomatically; clinicians may focus on gastrointestinal or urinary causes; and culturally sensitive genital examination may be deferred. Posner and Spandorfer found that children diagnosed after age eight were universally symptomatic in their series and underwent more ancillary testing than those diagnosed earlier, demonstrating the cost of missed physical examination. [7]

A recent Somali case report published in 2026 similarly emphasized delayed diagnosis in a culturally complex setting and showed that primary amenorrhea,

severe cyclic pain and a tense bulging hymenal membrane remained the decisive diagnostic features. [15] The present report broadens that emerging national evidence by documenting another severe obstructive presentation managed at Marwa Fertility Center, a major reproductive and gynecology facility in Mogadishu. [19] Together, these reports demonstrate that the diagnostic challenge is not merely theoretical: delayed presentation occurs in the Somali context and requires culturally respectful but clinically complete adolescent assessment, timely referral and access to definitive gynecologic surgery.

6.3 Significance of the present case

Three aspects strengthen the educational value of this case. First, the history contained a classic but easily missed diagnostic signal: recurrent pain for four to five days at approximately monthly intervals in a girl who had never menstruated. Second, the degree of vaginal distension was extreme enough to simulate a 25-week pregnancy-sized abdominal mass. Third, definitive surgical management produced immediate anatomic decompression and restoration of normal menstruation, demonstrating the high therapeutic yield of timely recognition.

6.4 Diagnostic strategy: history, examination and imaging

A structured evaluation of primary amenorrhea begins by asking whether pubertal development has occurred, whether a uterus is present, and whether there is evidence of an outflow obstruction. In a patient with normal breast development and cyclic pain, an anatomic obstruction should move high on the differential. A focused menstrual history should document age, any prior spotting, cyclicality of pain, urinary and bowel symptoms, and progression of abdominal distension. Examination should include assessment of secondary sexual characteristics, abdominal palpation and inspection of the external genitalia. [3,7]

The external genital examination is particularly high yield. A bulging, tense and often bluish hymenal membrane that becomes more prominent with Valsalva is characteristic of retained blood behind an imperforate hymen. In the present patient, a 6 × 6 cm bulging membrane posterior to the urethra provided direct localization of the obstruction. The finding explains both the absence of visible menses and the

abdominal mass without requiring complex diagnostic inference.

Ultrasound is typically the first-line imaging modality when confirmation is needed. It can demonstrate a distended vagina containing echogenic or low-level internal echoes, identify hematometra, assess the uterus and ovaries, and detect urinary tract compression.

ACOG guidance indicates that if a bulging hymen is clearly present and ultrasonography demonstrates hematocolpos, additional imaging is not routinely necessary. MRI is reserved for uncertain anatomy or suspicion of distal vaginal atresia, a thick transverse septum, cervical atresia, an obstructed uterine horn or other complex malformation. [3,4]

6.5 Resource-sensitive diagnostic reasoning

The case has particular relevance to resource-variable health systems in which advanced imaging may not be immediately available at the first point of contact. A careful history and respectful external genital examination can establish a highly probable diagnosis at minimal cost and can prevent delays caused by indiscriminate laboratory or radiologic testing. This does not imply that imaging should be avoided; rather, imaging should answer a defined clinical question. When a hymenal lesion is obvious and the anatomy is otherwise straightforward, examination has substantial diagnostic power. When anatomy is uncertain, referral and imaging are essential because surgery for distal vaginal atresia or a transverse vaginal septum differs materially from hymenal surgery. [3,4] Specialized referral centers in Mogadishu, including Marwa Fertility Center, can therefore play an important role in linking initial clinical recognition with definitive gynecologic management.

Regional reports support this approach. A Kenyan case described a 14-year-old with amenorrhea, abdominal pain and tenesmus who underwent hymenotomy for hematocolpometra, while recent reports from the Democratic Republic of the Congo and Somalia highlight urinary retention or delayed diagnosis as alternative presentations. [12,14,15] Together these cases show that the core diagnostic problem is consistent across health systems: clinicians must connect pubertal development, absent menses and recurrent pain with genital outflow obstruction.

6.6 Avoiding diagnostic pitfalls

Several diagnostic pitfalls should be avoided. Recurrent monthly abdominal pain in a postpubertal adolescent should not be attributed solely to gastrointestinal or nonspecific causes before menstrual status is documented. Normal secondary sexual development is not reassuring when menarche is absent; in the presence of cyclic pain, it may instead strengthen suspicion of an outflow obstruction. External genital inspection should therefore form part of the assessment when primary amenorrhea coexists with cyclic pain or a pelvic mass. At the same time, clinicians should not assume that every obstructive presentation represents an imperforate hymen, because atypical anatomy may indicate a transverse vaginal septum, distal vaginal atresia or another Müllerian anomaly requiring imaging and specialist evaluation.

6.7 Surgical management and prevention of recurrence

The aim of surgery is not simply to empty retained blood; it is to create a durable, anatomically safe menstrual outflow tract. A limited puncture or simple drainage may temporarily decompress the vagina but can reclose and may increase infection risk. Current guidance recommends a controlled cruciate or U-shaped incision with excision of redundant hymenal tissue and approximation of mucosal edges using absorbable sutures. Preoperative or intraoperative urethral catheterization helps define the urethral location and reduce injury risk. [3, 8]

The operative technique documented in this case aligns closely with these principles. The central stab incision was extended cruciately, the thick hymenal tissue was opened, approximately 1,500 mL of old menstrual blood was allowed to drain, redundant flaps were excised, and the internal vaginal mucosa was sutured to the external vestibular mucosa. The immediate disappearance of the abdominal mass demonstrated successful decompression, while the normal menstrual flow at six weeks provided early evidence of maintained patency.

6.8 Drainage considerations and infection

Large hematocolpos is typically composed of old altered menstrual blood. Rapid decompression often provides striking relief, but surgical manipulation should remain controlled. Guidance cautions against aggressive irrigation of a markedly distended vagina

because of concern for ascending infection. [3] In this case, culture of the vaginal contents showed no growth, the postoperative period was uncomplicated, and antibiotics were prescribed. The record does not specify the antibiotic agent, duration or whether prophylaxis was administered preoperatively, so those details should not be reconstructed.

6.9 Long-term prognosis

For an isolated imperforate hymen treated adequately, long-term prognosis is generally excellent. ACOG notes that isolated imperforate hymen is not typically associated with adverse fertility, sexual-function or obstetric outcomes. [3] Restenosis or adhesion after hymenal surgery is rare but reported, and patients should return if menstrual obstruction, recurrent pain or discharge develops. Persistent pain after correction also warrants consideration of endometriosis, which may occur after prolonged retrograde menstruation or coexist with obstructive reproductive tract anomalies. [11]

The present follow-up period was only six weeks, so long-term fertility and pain outcomes cannot be inferred. Nevertheless, the return of normal menstrual flow, absence of recorded postoperative complications and stable next-day discharge constitute a favorable early outcome.

For publication, longer follow-up—if available in the medical record—would strengthen the manuscript by

documenting continued regular menses, absence of restenosis and lack of recurrent pelvic pain.

6.10 Psychosocial and culturally sensitive care

Hymenal surgery in adolescents can carry cultural or family concerns that are distinct from its medical indication. Counseling should explain that an imperforate hymen is a congenital obstruction and that hymenotomy or hymenectomy is performed to establish normal menstrual outflow and prevent medical complications. The hymen is not a valid medical marker of sexual activity or “virginity,” and families should receive respectful, developmentally appropriate explanations before and after treatment. [3]

VII. COMPARISON WITH PUBLISHED LITERATURE

The present case is consistent with the dominant pattern in published adolescent cases—primary amenorrhea, cyclic pelvic or abdominal pain, a bulging hymen and rapid recovery after surgical opening—but differs in the degree of distension and the approximately 1,500 mL retained volume. Table 4 positions the case alongside selected recent and regional reports. The comparison is descriptive rather than statistical because case reports are heterogeneous and selectively published.

Table 4. Selected published cases/reviews compared with the present case

Study	Setting / age	Key presentation	Management / outcome	Comparison
Mwenda, 2013 [12]	Kenya; 14 y	Primary amenorrhea, abdominal pain, tenesmus; hematocolpometra	Hymenotomy; clinical improvement	Regional example showing bowel-pressure symptoms
Marino et al., 2023 [6]	Systematic review + case	Hematocolpos in adolescent girls; pelvic/genital pain and amenorrhea emphasized	Timely hymenotomy/hymenectomy; follow-up for recurrence	Supports early surgical correction and follow-up
Ultrasound case, 2023 [13]	14 y	Lower abdominal pain, urinary retention; hematocolpometra on ultrasound	Hymenectomy; ~900 mL drained; symptoms resolved	Demonstrates imaging confirmation and substantial retained volume
Laasri et al., 2024 [16]	Morocco; 11 y	Suprapubic pain and acute urinary retention; hematocolpos/hematometra	Cruciate incision; urinary symptoms resolved	Highlights urinary tract compression
Muyisa et al., 2025 [14]	DR Congo; 15 y	Acute urinary retention and lower abdominal pain	Surgical treatment; emphasis on preventing hydronephrosis/renal injury	Age comparable; urinary presentation differs

Ahmed et al., 2026 [15]	Somalia; 17 y	Primary amenorrhea, severe cyclic pain; delayed diagnosis; coexisting type II FGM	Cruciate hymenectomy; ~700 mL evacuated; uneventful recovery	Important Somali contextual comparison
Kleina et al., 2026 [17]	Poland; 14 y	Severe abdominal pain mimicking appendicitis; absent menses, cyclic pain	Hymenotomy; full recovery	Shows surgical-abdomen mimic and value of menstrual history
Present case	15 y	Primary amenorrhea, cyclic pain, 25-week-size mass; no urinary/bowel complaints	Cruciate hymenotomy; ~1,500 mL drained; normal menses at 6 weeks	Exceptionally large hematocolpos with favorable early outcome

7.1 Interpretation of the comparison

Across these reports, the recurring diagnostic signal is the same: an adolescent who has developed secondary sexual characteristics but has not menstruated and who experiences cyclic pain. What varies is the organ system that dominates the presentation. Some patients present with urinary retention or hydronephrosis, others with bowel symptoms, acute abdomen or nonspecific pain. The present patient was unusual because a very large hematocolpos developed without documented urinary or bowel dysfunction. This reinforces that clinicians should not wait for obstructive complications before considering the diagnosis.

The 1,500 mL volume in the present case also exceeds the approximately 700 mL documented in a recent Somali case and the approximately 900 mL reported in a 2023 case, although direct comparisons are limited by differences in duration, measurement technique and whether uterine contents were included. [13,15] The clinical point is therefore qualitative: large-volume retention can accumulate while vital signs remain normal and systemic examination remains reassuring.

VIII. DIAGNOSTIC AND MANAGEMENT PATHWAY

8.1 Clinical implications

Primary amenorrhea is a diagnostic sign rather than a benign variation in a pubertally developed adolescent, particularly when it is accompanied by cyclic pelvic or abdominal pain. Linking menstrual history with a respectful external genital examination can prevent delayed recognition, unnecessary investigations and progression to massive hematocolpos. This principle is especially relevant in referral systems where adolescents may initially present to general outpatient,

emergency, pediatric or surgical services before reaching a gynecology unit.

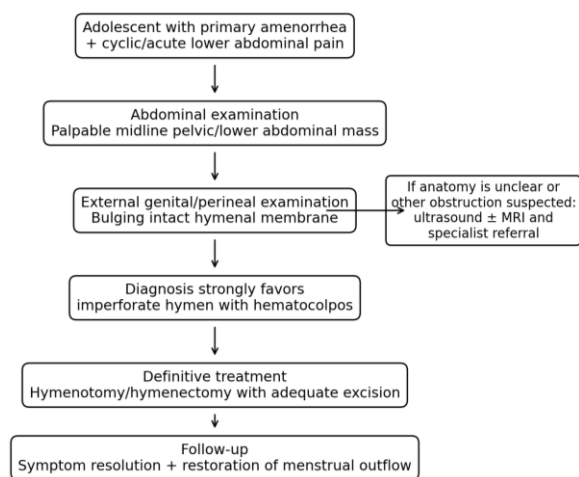


Figure 2. Practical diagnostic-management pathway for suspected imperforate hymen in an adolescent.

Figure explanation: Primary amenorrhea with cyclic pain should trigger assessment for genital outflow obstruction. A bulging imperforate hymen can establish the level of obstruction; uncertain anatomy warrants ultrasound and, when indicated, MRI before surgery. [3,4]

8.2 Practical recommendations for clinicians

In practical terms, clinicians should document menarche and pain cyclicality in every postpubertal adolescent with recurrent pelvic or abdominal symptoms, assess pubertal development, and perform a respectful external genital examination whenever an outflow obstruction is suspected. Ultrasonography is appropriate for confirmation and for assessment of the uterus, vagina and urinary tract, while MRI or specialist review should be reserved for uncertain

anatomy or suspected proximal obstruction. Definitive management should use an accepted hymenal opening or excision technique rather than aspiration or inadequate drainage, and follow-up should confirm continued menstrual patency, resolution of pain and absence of recurrent obstruction.

8.3 Implications for resource-limited settings

In resource-constrained and resource-variable settings, complete history and focused examination can be decisive. Regional African reports demonstrate that imperforate hymen can be recognized and treated effectively without diagnostic overreliance on advanced technology. [12,15] At the health-system level, adolescent-friendly counseling, clear referral pathways and access to specialized gynecology services are essential for reducing delay. The experience at Marwa Fertility Center illustrates how a specialized reproductive-health center in Mogadishu can contribute to this referral pathway by providing gynecologic assessment and operative care in addition to fertility services. Recent published research independently identifies Marwa among the major reproductive and gynecology centers in the city. [19]

IX. STRENGTHS, LIMITATIONS, NOVELTY AND REPORTING QUALITY

9.1 Strengths

The case contains a coherent clinical sequence from symptoms to examination, operative management, microbiologic result, discharge and six-week functional follow-up. The physical findings are unusually descriptive, including Tanner stage, abdominal mass characteristics, a measured 6 × 6 cm bulging hymenal membrane and the Valsalva response. The operative record also provides a concrete drainage volume and reconstructible technique. These details allow meaningful comparison with guideline-based care and recent case literature.

9.2 Limitations

Several limitations should be acknowledged transparently. The source record does not document preoperative ultrasound or MRI, hematologic or biochemical investigations, exact calendar dates, duration of the chronic cyclic symptoms, intraoperative photographs, postoperative pelvic imaging, or follow-up beyond six weeks. It also does

not provide a patient perspective. The report therefore cannot comment on long-term restenosis, dysmenorrhea, endometriosis, sexual function or reproductive outcome. Publication consent is not the same as operative consent and must be separately confirmed before submission.

9.3 Novelty and contribution

Imperforate hymen itself is not novel; the contribution lies in the magnitude and clarity of the presentation and in its regional clinical context. A 25-week-size fluid-containing abdominal mass with approximately 1,500 mL of retained menstrual blood represents severe delayed accumulation, yet the patient remained afebrile with normal vital signs and had no urinary or bowel complaints. The case therefore expands the clinical spectrum by showing that massive hematocolpos can remain predominantly gynecologic in symptom expression. It also adds a well-documented case from a major reproductive and gynecology referral setting in Mogadishu to the limited but growing African and Somali literature on delayed obstructive presentations. [12,15,19]

Table 5. CARE reporting checklist mapping for this manuscript

CARE item	Status in manuscript	Notes before submission
Title / Keywords	Complete	Includes diagnosis and “case report”
Abstract	Complete	Structured clinical summary and take-away lesson
Introduction	Complete	Rationale and literature context provided
Patient information	Complete from source	De-identified; no name or direct identifier included
Clinical findings	Complete from source	General, Tanner, abdominal and perineal findings reported
Timeline	Complete	Figure 1 uses relative timing because dates unavailable
Diagnostic assessment	Complete with limitation	No imaging/lab data invented
Therapeutic intervention	Complete from source	Technique, drainage volume and perioperative care included

Follow-up/outcomes	Complete to 6 weeks	Longer follow-up not available
Patient perspective	Not available	Add only if genuinely obtained
Informed consent for publication	Pending confirmation	Must be obtained/documented before journal submission

X. CONCLUSION

Imperforate hymen should be considered early in any pubertally developed adolescent who presents with primary amenorrhea and recurrent cyclic abdominal or pelvic pain. The present case demonstrates the potential consequences of delayed recognition: progressive menstrual retention produced massive hematocolpos, a 25-week-size lower-abdominal mass and approximately 1,500 mL of accumulated old blood. Despite the dramatic anatomy, definitive treatment was straightforward. A cruciate hymenotomy with excision and mucosal edge suturing produced immediate decompression, an uncomplicated postoperative course and restoration of normal menstrual flow by six weeks.

The most transferable lesson is diagnostic rather than technical. A careful menstrual history and respectful external genital examination can rapidly identify a distal outflow obstruction and may prevent unnecessary testing, urinary or bowel compression, infection and prolonged pain. When anatomy is uncertain, imaging and specialist referral remain essential. When an isolated imperforate hymen is clearly established, timely definitive surgery is highly effective and prognosis is generally favorable.

XI. DECLARATIONS

Ethics approval

Case-report ethics requirements vary by institution and journal. The authors should obtain a written determination from the relevant institutional authority if required and insert the approval/exemption statement here.

Consent for treatment

Written informed consent for the surgical procedure was documented in the clinical record.

Consent for publication

The available case record does not document consent for publication. Written informed consent for publication should be obtained from the parent/legal guardian and assent from the adolescent when applicable, according to journal and local requirements.

Patient perspective

Not available in the source record. A patient/guardian perspective may be added only if obtained directly and voluntarily.

Competing interests

No conflict-of-interest statement was available in the source case record.

Funding

No funding information was available in the source case record.

Authors' contributions

Contributions should be described using the CRediT taxonomy or the target journal's authorship format.

Data availability

The clinical information underlying this report is contained in the patient medical record and is not publicly available because of confidentiality obligations. Any journal-specific data statement should preserve patient privacy.

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