Asian Journal of Health Research
Journal Homepage: https://a-jhr.com
Published by Ikatan Dokter Indonesia Wilayah Jawa Timur

OPEN ACCESS

Case Report

Imperforate Hymen: A Case Report on A Modern Hymenectomy Incision Method

Erika Kusumawardani[1*], M. Ali Sabisi[2], Adrian Desmar Pardomuan Ringo Ringo[3]

[1] Department of Obstetrics and Gynaecology, Faculty of Medicine, Universitas Batam Riau Island, Indonesia, 29432
[2] Department of Internal Medicine, Faculty of Medicine, Universitas Batam Riau Island, Indonesia, 29432
[3] Department of Medicine, Faculty of Medicine, Universitas Brawijaya East Java, Indonesia, 65143

ARTICLE HISTORY
Received: 26 January 2026
Revised: 16 February 2026
Accepted: 22 March 2026

CORRESPONDING AUTHOR*
Erika Kusumawardani
erika@univbatam.ac.id
Department of Obstetrics and Gynaecology,
Faculty of Medicine, Universitas Batam Riau Island,
Indonesia, 29432

KEYWORDS
Hematometra; Hymenectomy; Imperforate Hymen; Metocolpos

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ABSTRACT

Introduction: An imperforate hymen is a congenital condition in which the hymen completely obstructs the vaginal canal. Many patients remain asymptomatic until menarche, when they may present with primary amenorrhea, a pelvic mass, and cyclic abdominal pain. The traditional hymenectomy technique involves a cruciate (cross-shaped) incision with excision of the quadrants and approximation of the hymenal edges to the vestibule using absorbable sutures. However, this method can be associated with scar formation and subsequent reclosure of the hymen.

Case Presentation: A 12-year-old girl presented with cyclic abdominal pain for three months, which worsened one week prior to admission. She complained of severe abdominal pain starting six hours before hospital admission. Physical examination revealed a palpable lower abdominal mass, tenderness, and no visible hymenal opening. Ultrasonography showed hematometra and hematocolpos, leading to the diagnosis of imperforate hymen. The patient underwent an annular hymenectomy using electrocautery to create a circumferential (ring-shaped) excision, aiming to prevent postoperative hymenal closure and scarred hymenal contour.

Conclusion: An imperforate hymen should be considered in premenarcheal adolescent girls presenting with cyclic abdominal pain. Annular hymenectomy using electrocautery offers a modern surgical approach that may reduce postoperative hymenal reclosure and scarring compared with the traditional cruciate technique.

Cite this as: Kusumawardani E, Sabisi MA, Ringo ADPR (2026) Imperforate Hymen: A Case Report on A Modern Hymenectomy Incision Method. *Asian J Heal Res.* 5 (1): 56–61. doi: https://doi.org/10.55561/ajhr.v5i1.322

INTRODUCTION

The hymen is a thin membrane covering the vaginal opening [1,2]. Imperforate hymen is a rare congenital anomaly (0.01–0.1% prevalence) [1,3] caused by incomplete canalization of the Müllerian and urogenital systems [4], and is the most common cause of vaginal obstruction [4–6]. It usually presents after menarche with primary amenorrhea, abdominal pain, urinary retention, or hematocolpos/hematometra [4,7].

Diagnosis is made by genital inspection and ultrasonography. Standard treatment is hymenectomy, traditionally using a cruciate incision [8], though this may cause scarring and reclosure [9]. A modern circular hymenectomy preserves hymenal contour, reduces recurrence, and offers improved cosmetic and functional outcomes, particularly relevant in cultural contexts [8–11].

CASE PRESENTATION

A 12-year-old girl presented with cyclic abdominal pain for three months ago and worst 1 week ago. The patient complained of severe abdominal pain 6 hours before being admitted to the hospital. The patient's other complaint is lower back pain. The pain is experienced simultaneously with abdominal pain. The back pain is reported to improve with the application of warming topical oil. The patient also experiences nausea and vomiting. Nausea and vomiting have been present since one day prior to hospital admission. The frequency of vomiting is reported as once. The vomitus contained food and drink previously consumed by the patient. The patient reports having experienced pain during urination. The daily frequency of urination is 4–5 times, with a volume of approximately one glass of water each time, and the urine is clear yellow.

Bowel movements are reported as normal, occurring once per day. There is no constipation or diarrhoea. Appetite has decreased since three days prior to admission, but fluid intake is reported as adequate. The patient is able to drink approximately 3 liters per day. There is no fever.

The obstetrician and gynaecologist performed a physical examination and found a palpable mass in the lower abdomen, tenderness, and no visible opening in the hymen (Figure 1). Further evaluation with ultrasonography revealed hematometra and hematocolpos (Figure 2). Finally, a diagnosis of imperforate hymen was made. Hymen covers the entire vaginal introitus, pink in colour, bulging present (+), no blood observed (-) (Figure 3).

DISCUSSION

An imperforate hymen is a congenital anomaly resulting from incomplete canalization of the Müllerian and urogenital systems, leading to the failure of the hymen to form a hymenal opening. This condition gives rise to various complaints associated with the female reproductive system [5].

A 12-year-old female patient presented to the emergency department with complaints of lower abdominal pain persisting for approximately one week prior to admission. The patient also reported lower back pain, nausea, vomiting, and a history of dysuria. These symptoms had occurred three months prior to admission and recurred monthly. The patient had not yet experienced menarche. Based on the history, cyclic abdominal pain in a pubertal girl with primary amenorrhea suggests the



Figure 1. Imperforate Hymen. Hymen covers the entire vaginal introitus, pink in color, bulging present (+), no blood observed (-).

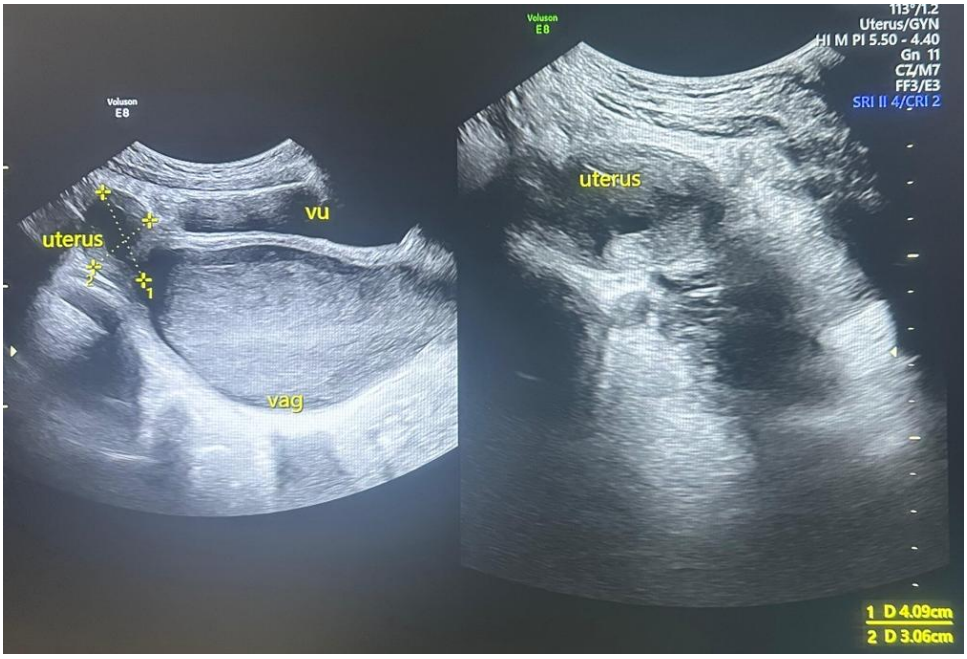


Figure 2. Ultrasonography Imperforate Hymen. An intrauterine hypoechoic area is seen with hyperechoic features. The vagina is enlarged, containing hyperechoic and hypoechoic contents, suspicious for hematometra and hematocolpos.



Figure 3. Postoperative Hymenectomy in This Patient

possibility of vaginal obstruction, with imperforate hymen being the most common cause. The prevalence of imperforate hymen is estimated at 0.01%–0.1%. Although rare, it is the most frequent cause of vaginal outflow obstruction. Typically, this anomaly remains undetected until menarche, when the most common clinical presentation is primary amenorrhea. Adolescents with

imperforate hymen usually present with lower abdominal or pelvic pain, which may coincide with the onset of the menstrual cycle [2].

Additional symptoms include nausea, vomiting, and dysuria. Other associated features of imperforate hymen include back pain, urinary retention (seen in 37%–60% of patients), and constipation [3,12]. Overdistension of the vagina can cause lower abdominal, pelvic, and back pain. Urinary disturbances result from pressure exerted by the distended vagina on the urethra, impeding bladder emptying. Suprapubic pain accompanied by urinary symptoms may manifest as dysuria, urgency, and overflow incontinence. Obstructive and irritative urinary symptoms, such as retention and dysuria, are reported in up to 58% of patients with hematocolpos [2,13,14].

From the patient's maternal history, it was noted that antenatal care was conducted by a midwife and an obstetrician, with no reported abnormalities during pregnancy. The patient was delivered vaginally at a village midwife clinic, and no congenital anomalies were noted at birth. However, symptoms only became apparent after puberty, consistent with findings by Jang in 2021 regarding delayed diagnosis until adolescence [12]. Diagnosis is often delayed until puberty, when complaints of delayed menstruation, cyclic abdominal pain, lower abdominal swelling, and vaginal bulging become evident [4,14].

Physical and genital examination revealed a palpable mass in the suprapubic region, cystic in consistency, fixed, with a smooth surface, and tenderness in the suprapubic and left hypochondriac areas. The hymen was observed to cover the entire vaginal introitus, pink in colour, with bulging present, and no blood [1,2]. Imperforate hymen typically appears as a pale pink to bluish membrane bulging into the vaginal vestibule. If bulging is not apparent at rest, it may become evident during a Valsalva manoeuvre. Additional investigations are necessary to rule out other causes of vaginal obstruction [3,4,15].

Ultrasonography in this patient demonstrated an enlarged uterus and vagina, accompanied by hematocolpos and hematometra. This is consistent with the pathophysiology of imperforate hymen, wherein menstrual blood accumulates during adolescence, resulting in mass effects in the vagina and uterus, termed hematocolpos and hematometra. Reflux of endometrial tissue through the fallopian tubes (hematosalpinx) may lead to secondary endometriosis [13,15]. Pelvic sonography often reveals hematocolpos, hematometra, and possibly hematosalpinx when diagnosis is made after the onset of endometrial shedding. Hematometra typically appears as a hypoechoic area within the uterine cavity. Laboratory studies are required as preoperative assessments for underlying medical conditions [2,3,5].

The diagnosis of imperforate hymen is established through history, physical, and supportive examinations. Once diagnosed, appropriate follow-up is necessary. The patient received pharmacological therapy, including intravenous ranitidine 50 mg twice daily, ondansetron 4 mg intravenously, oral mefenamic acid 500 mg three times daily, and oral cefadroxil 500 mg twice daily. Pharmacological therapy aims to address clinical complaints such as pain, nausea, and vomiting. Nonsteroidal anti-inflammatory drugs (NSAIDs) may be used for analgesia, and narcotic analgesics may be required in some cases. Disruption of the hymenal barrier can predispose to ascending pelvic infection and pelvic inflammatory disease, necessitating empirical antibiotic therapy [3,12,15].

Surgical management was performed via hymenotomy, a procedure in which the hymen is incised or excised to treat structural abnormalities (Figure 3). Resection of the imperforate hymen is necessary to relieve pain, discomfort, and to establish a functional genital tract. The incision performed was an annular (ring-shaped) incision of the hymen to prevent recurrence, without suturing and using cauterization [5].

On postoperative day one, the patient was discharged with continued pharmacological therapy, including antibiotics and painkillers. After hymenotomy and evacuation of hematocolpos, outpatient follow-up was arranged [9,10,14]. The patient and family were informed regarding the continued drainage of old, dark, thick blood for several days to a week post-procedure. Mild cramping may occur as the hematometra resolves [15].

An imperforate hymen is a hymen that completely lacks an opening (hymenal hiatus). It is a congenital anomaly resulting from incomplete

canalization of the Müllerian and urogenital systems. The clinical manifestations of an imperforate hymen vary with age. In newborns with an imperforate hymen, the membrane often bulges between the labia due to retained mucous secretions. The membrane may appear white due to distension from mucoid material secreted as a result of maternal estrogen stimulation (mucocolpos). Adolescents with an imperforate hymen typically present with lower abdominal or pelvic pain, which may coincide with the onset of the menstrual cycle.

CONCLUSION

Imperforate hymen should be considered in premenarcheal adolescent girls presenting with cyclic abdominal pain. Annular hymenectomy using electrocautery offers a modern surgical approach that may reduce postoperative hymenal reclosure and scarring compared with the traditional cruciate technique.

ACKNOWLEDGMENT

There is no acknowledgement.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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