

Imperforate & Microperforate Hymen: A Case Series of Diagnosis and Management of Three Adolescents

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Abstract:

Introduction: Imperforate hymen (IH) is a rare obstructive congenital anomaly of the female genital tract. It arises as a result of complete failure of canalisation of inferior end of the vaginal plate at the junction between the urogenital sinus and the vagina during foetal life. Patients are usually asymptomatic until onset of menarche after which menstrual blood begins to accumulate in the vagina leading to a spectrum of symptoms described later in the text. Microperforate hymen (MH) is a type of obstructive hymenal membrane, in which there is a tiny opening in hymen, which can lower the quality of life of the young women by interfering with vaginal intercourse and menstrual hygiene. Presentation in MH patients depends largely on hole size.

Case Reports: We are reporting here cases of three adolescent girls who presented to Rajindra Hospital Patiala (RHP). Two of these were diagnosed with imperforate hymen and one with microperforate hymen.

Discussion: A detailed gynecological history and examination play a key role in predicting these conditions. These conditions can be treated surgically by performing hymenotomy.

Conclusion: Early diagnosis and management of imperforate and microperforate hymen helps in relieving the symptoms and preventing potential complications. Both of these two conditions can be managed surgically with very good outcome.

Keywords: Imperforate Hymen, Microperforate Hymen, Cryptomenorrhoea, Adolescents.

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Introduction

Imperforate hymen is a rare obstructive congenital anomaly of the female genital tract with prevalence of 0.05%- 0.1%. It arises as a result of complete failure of canalisation of the inferior end of the vaginal plate at the junction between the urogenital sinus and the vagina during foetal life.[1] It was first described by Ambroise Pare in 1633.[2]

Hymen provides a physical barrier to infection before puberty when immunity of vagina is not yet fully developed. Patients typically do not show symptoms until they reach menarche, at which point they may experience the accumulation of menstrual blood in the vagina, resulting in a range of symptoms including hematocolpos, hematometra, and hematosalpinx resulting in symptoms such as primary or secondary amenorrhea, recurrent cyclical lower abdominal pain, bluish bulge at the

vaginal introitus, acute or chronic retention of urine, abdominal mass, endometriosis due to retrograde menstruation or rarely constipation and intestinal obstruction.[3] Microperforate hymen (MH) is a type of obstructive hymenal membrane, in which there is only a tiny opening, which can lower the quality of life of the young women by interfering with vaginal intercourse and menstrual hygiene. Only 20 cases of MH have been reported in literature.

However, its exact incidence is not known.[4] One of the most important differences between microperforate hymen and imperforate hymen in adults is that MH presents with menstruation, while IH is associated with primary amenorrhea.[5,6] These patients may also present with inability to have vaginal intercourse and conceive. But there are

cases reports of pregnancy occurring in cases with microperforate hymen as well.[7,8] Presentation in MH patients depends largely on the hole size. Patients may experience prolonged light bleeding after their menstrual period.

Abdominal pain, urinary retention or dysuria and pyocolpos leading to malodorous vaginal discharge with fever may be the presenting features in acute cases. Pyocolpos or pus-filled vagina occurs as a consequence of ascending infection and the invasion of trapped vaginal secretions. [9]

Case reports: We are reporting here cases of three adolescent girls who presented to Government Medical College and Rajindra Hospital Patiala (RHP).

Case 1: A 14 years old adolescent girl presented to Gynaecology emergency room RHP on 16th February 2023 with complaint of cyclical lower abdominal pain along with heaviness in lower abdomen since last 6 months. Intensity of pain had increased recently since last 4 days.

There was complaint of dysuria since 5 days and constipation since 4 days. Patient was taking over-the-counter oral analgesics for pain relief. She had not attained menarche yet.

There was no familial history of delayed menses in the immediate family.

On examination: Patient had moderate built.

Breast examination: Tanner stage 3.

Axillary hair – Tanner stage 2.

Thyroid gland normal and no features of hirsutism noted

Per abdomen: A palpable mass of approximately 18 weeks uterus size with mild tenderness was felt in infraumbilical region and there was fullness with mild tenderness in both right and left inguinal fossae.

External genitalia: Pubic hair-Tanner stage 2. Tense, bluish, bulging membrane posterior to urethra (imperforate hymen) seen.

Per rectal examination: A tense, compressible pelvic mass was felt anterior to rectum.

Routine blood and urine investigations were normal. UPT: negative.

Ultrasound whole abdomen and pelvic organ showed collection with low level echoes in uterus measures ~ 13cm * 8 cm * 7.7 cm s/o Hematometra.

Right ovary: there was seen cystic lesion with low level internal echoes measures ms ~ 4.3 cm * 3cm s/o Endometrioma.

Left ovary: there was seen a cystic lesion with low level internal echoes measures~ 4cm * 3cm s/o Endometrioma

Bilateral kidneys: Pelvicalyceal system was prominent

MRI –pelvic organs showed enlarged uterus with grossly distended uterine cavity with contents having MRI morphology consistent with blood products in varying stages of evolution along with resultant extreme myometrial thinning consistent with hematometra formation.

Uterus / cavity per se measure approximately 4.8cm X 6.4cm X 7.8cm CC.

Vagina: Grossly dilated~ hematocolpos (approx.16.6cm X 7.5cm x 8.5cm CC).

Both the fallopian tubes dilated with blood products s/o Bilateral hematosalpinx the mass effect manifested as bilateral hydroureteronephrosis (left more than right).

Management (Case 1):

Patient was admitted to RHP on 16/2/2023 and required investigations done. On 21/2/2023, under short general anaesthesia, patient was catheterised and hymenotomy was done using a cruciate incision, thus draining the hematocolpos and hematometra. About 400 cc of tarry coloured menstrual blood was drained. The surgical outcome was good. Patient discharged in satisfactory condition. Patient came to OPD, twice after discharge (March 2023 & April 2023) and was having regular cyclical menstrual bleeding.

Case 2: A 13 year old female came to Gynaecology OPD, RHP on 7th September 2023 with complaints of primary amenorrhea and urinary retention for 5 days. Before reporting to RHP on 7th September, patient had gone to CHC Bhadson where patient was catheterised and got relieved.

Patient had no history of cyclical abdominal pain. There was no relevant family history.

On examination: Patient had thin built.

Breast examination: Tanner stage 4.

Axillary hair: Tanner stage 4

Per abdomen examination: soft, nontender

External genitalia: Pubic hair-Tanner stage 4. A bluish bulging membrane seen covering the introitus, rest of the external genitalia were normal looking.

Per Rectal examination: uterus was normal sized, bulge felt in vagina.

Routine blood and urine investigations were normal.



Figure 1: Shows hymenotomy being done by cruciate incision and the resulting drainage of menstrual blood.

Transabdominal ultrasound showed uterus anteverted, normal size, and endometrial thickness 6.6 mm, no mass in uterus wall. Cervix normal. There was collection with fluid debris level measures 11.7*9.2*8.4cm, around 470 ml seen extending from cervical canal in to vagina? hematocolpos. Bilateral ovaries normal no fluid in cul-de-sac.

On MRI, uterus and cervix appear displaced superiorly and slightly left by grossly distended vagina and superiorly seen reaching up just below the level of umbilicus (above pelvic brim).

Vagina: grossly dilated with cystic ballooning in its entire length up to location of hymen (12.5cm *7cm *9cm) and distended with contents having MRI morphology consistent with blood. There was compression of urinary bladder anteriorly and rectum posteriorly.

Bilateral ovaries, kidneys were normal.

History, examination and MRI finding were suggestive of imperforate hymen.

Management (case 2): Patient was admitted at RHP on 7th September 2023 & on 15th September 2023. Under short general anaesthesia, Cruciate incision was given over imperforate hymen and 50 cc tarry coloured fluid drained. Post-operative period was uneventful. Patient discharged in satisfactory condition. Patient came for follow up in OPD twice after discharge (October 2023 & November 2023) and was having regular cyclical menstrual bleeding.



Figure 2: Shows patent introitus after hymenotomy.

Case 3: An 18-year-old unmarried female presented to Gynaecology OPD at RHP on 10th October 2023 with complaint of difficulty in passage of menstrual blood since 2 months.

Patient complained that she has to press her labia on 2nd and 3rd of periods for draining menstrual blood and she had severe dysmenorrhoea.

However, her menstrual cycles were regular. Also, patient gave history of difficulty in passage of urine since 2 months. Patient had menarche at 15 yrs of her age. There was no similar history in her family.

On examination: Patient had thin built

Breast examination: Tanner stage 3

Axillary hair: Tanner stage 3

External genitalia: Pubic hair-Tanner stage 3. Labia majora were fused; membranous hymen was present with small dimple like opening. Menstrual blood could be drained after applying pressure over membranous hymen. Routine blood and urine investigations were normal except her TSH level was 8.055uIU/ml and anti TPO antibodies were 562 U/ml.

MRI showed vagina was well formed with normal configuration. Vaginal cavity was distended distally with contents of blood and blood product. There was a thin, incomplete membrane in the region of introitus. There was no evidence of hematometra/pyometra and bilateral ovarian were with polycystic morphology. Both labia majora and minora were formed. MRI findings in combination with

clinical findings were representative of labial fusion aka labial agglutination aka synechia vulvae

aka labial adhesions.

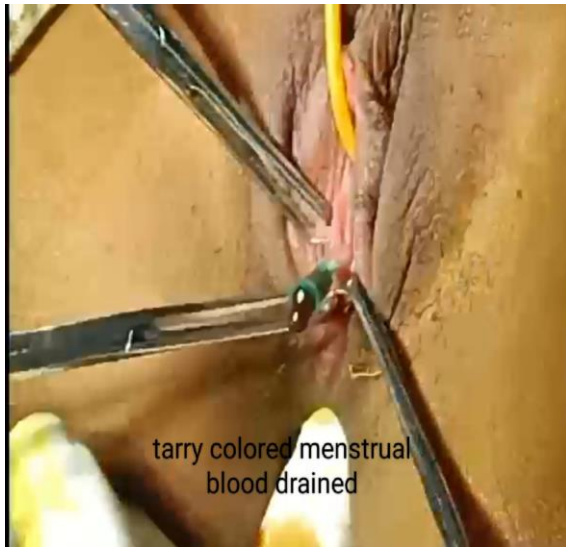


Figure 3: Shows drainage of menstrual blood after insertion of syringe through imperforate hymen.



Figure 4: Shows cruciate incision being made on imperforate hymen.

Management (Case 3): Patient got the required investigations done and was diagnosed with hypothyroidism and treatment was started for the same. Patient was admitted to RHP on 9th December 2023 and was examined under short general anaesthesia on 11th December 2023. On examination, membranous hymen was present with small dimple like opening. Uterine sound was introduced in the small opening & simultaneously per rectal examination was done to confirm that sound was in vagina. Thereafter, manual stretching of opening was

done. With pressure given by finger, fused labia gave a way and got separated, and vaginal opening was seen clearly. Per vaginal examination done, cervical opening was felt and uterus was normal in size. Gradual dilatation of introitus was done. Patient did well postoperatively. Patient's menstrual bleeding started on 13th December 2023 (POD-2) and she did not have any discomfort during menstrual bleeding. Also she did not have to press her labia for passage of menstrual blood per vaginam. Patient came for follow up in OPD in January 2024 and she had uneventful periods in January 2024.



Figure 5: Shows a small, tiny opening in hymen just below urethra (microperforate hymen).



Figure 6: Shows post hymenotomy image.

Discussion

Imperforate hymen with hematocolpos or hematometra is a relatively uncommon yet familiar congenital anomaly observed by pediatric and gynecologic surgeons. It typically presents as an isolated condition, but in rare instances, it can be accompanied by additional anomalies within the female genitourinary tract or genetic disorders. Therefore, other associated Mullerian anomalies should be ruled out. Although it is sporadic in occurrence, multiple familial cases have been reported with both dominant and recessive inheritance.[3] On examination, imperforate hymen appears as a bluish bulging membrane showing transillumination at the introitus. A detailed gynecological history and examination play a key role in predicting the condition. The diagnosis is made then on abdominal ultrasound by a radiologist. Ultrasound is an initial modality of choice and MRI is the gold standard. On ultrasound, there is a large blood-filled heterogeneous mass seen posterior to the bladder showing internal echoes which are seen filling the vaginal or uterine cavity. MRI imaging reveals a mass in the vagina or posterior uterus, behind the bladder, exhibiting hyperintensity on T1WI and hypointensity on T2WI which shows fluid intensity. On MRI, we can also see the connection of the fluid-filled cavity to the obstructed lumen.[10] Other disorders of female outflow tract (transverse vaginal septum), appendicitis, nephrolithiasis and abdominal tumor constitute the differential diagnoses.

After a hymenotomy, the hematocolpos is surgically drained avoiding damage to the urethra and Bartholin's glands. To achieve this, incisions are avoided at 5 and 7 o'clock positions to respect the orifices of the Bartholin's glands.[11] Maintaining asepsis during surgery is crucial because, in addition to providing an excellent culture medium for bacterial growth, a closed vagina lacks the protective Doderlein's bacilli, which causes the vagina to have an alkaline or mildly acidic pH and poor natural resistance to bacteria entering from the lower genital tract.[12] There are various incisions described for hymenotomy in imperforate hymen. The most common cruciate or cruciform incision involves making a cross-shaped incision in the hymenal membrane.

Complications of hymenotomy include bleeding, scarring and restenosis of vaginal opening.[13] Evacuation of a large hematocolpos may result in serious complications. Hence, patient should be prepared for both abdominal and perineal surgery beforehand in case of large hematocolpos. Before incising the imperforate hymen, it is important to conduct a rectoabdominal examination to assess for any potential accompanying hematometra or hematosalpinx. If the involvement is limited to the vagina, the uterus may be palpated as a distinct, smaller

mass on the apex of the distended vagina. The presence of soft and tender masses in the adnexal regions could indicate the presence of hematosalpinx or hematometra. A hematosalpinx may be torn away from its adhesions to the parietal peritoneum after decompression of the vagina, which may result in intra-peritoneal hemorrhage. To ensure the appropriate drainage of hematosalpinx or hematometra in cases of suspected adnexal involvement, it is recommended to perform a laparotomy before incising the hymen.[14]

Microperforate hymen can be treated by hymenectomy using electrocautery or by cruciate incision. Then 16 Fr Foley's catheter can be placed and 10 ml balloon insufflation done to preserve hymenal tissue. Carbon dioxide laser treatment can also be done. In individuals without infectious symptoms or acute blockage, Hegar's dilators can be used to dilate the vaginal introitus under general anaesthesia.[15] In majority, microperforate hymen may be a surgical emergency. Any delay in treatment can lead to pyosalpinges, pelvic abscess, sepsis, vaginal scarring and vesicovaginal fistula.[16,17]

Conclusion

In adolescents with cyclical abdominal pain and primary amenorrhoea, possibility of imperforate hymen should be considered. Imperforate and microperforate hymen can be diagnosed by history and examination findings. Radiological investigations help in determining the presence and extent of hematocolpos, hematometra and hematosalpinx. Early diagnosis and management of imperforate hymen is important to prevent its sequelae like endometriosis. Microperforate hymen should also be diagnosed and treated as soon as possible, as can it lower the quality of life of young women or may even present as an acute surgical emergency. Both of these two conditions (IH & MH), can be managed surgically with very good outcome.

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