An 11-year-old girl complained of severe pelvic pain over the past month. The pain had increased in severity over the past week. On clinical examination, an imperforate hymen was suspected.

**Imaging Findings:**

A pelvic ultrasound shows echogenic fluid filling the vagina and endometrial cavity. Layering of fluid was noted (Fig. 1a, c). Both ovaries are normal in size with multiple follicles (Fig. 1b). The dilated vagina is seen compressing the urinary bladder anteriorly, identified by a Foley catheter bulb within it (Fig. 1c). Axial, sagittal and coronal T2w images show fluid of high signal intensity within the vagina and uterus (Fig. 2a-c). The haemorrhagic content is confirmed by the presence of high signal intensity on T1 fat suppression (met haemoglobin) (Fig. 2d). Inferiorly, a portion of the vagina is evident ruling out vaginal atresia as the underlying cause. No transverse vaginal septum is seen. No uterine structural anomalies nor haematosalpinx were detected on MRI. No renal anomalies were identified by ultrasound (not included in the image section).

**Discussion:**

An imperforate hymen is a common cause of vaginal obstruction, whereby vaginal and cervical secretions are retained within the vagina and uterine cavity in premenarchal girls or menstrual blood is retained in pubertal females [4].

Haematometrocolpos refers to a uterus and vagina distended by blood; if it is simply the vagina distended by blood products, then the condition is referred to as haematocolpos. The estimated incidence in teenagers is at about 1 in 1000 - 2000 [1, 2]. Causes include imperforate hymen in about 2/3 of cases, transverse vaginal septum, vaginal stenosis and vaginal atresia [1, 4]. The condition is also known to be associated with Muellerian duct and renal anomalies [2] and is recognised as a complication following pelvic irradiation for malignant tumours in pubertal girls [5].

Ultrasound is the first line imaging investigation, and demonstrates a distended midline tubular structure lying between the compressed bladder and rectum, the contents of which are echogenic. Complications due to mass effect can be present. Correlated MRI images will show the haemorrhagic content within the vagina and uterus as
described above. MR signal will help to distinguish between clear fluid content (hydrometrocolpos) and haemorrhagic content.

A transverse vaginal septum can occur at almost any level of the vagina [3]. This is due to failure in the resorption of the tissue between the vaginal plate and the caudal aspect of the fused Muellerian ducts. The characteristic imaging findings of haematometrocolpos are described in the imaging section.

Following ultrasound, a thorough physical examination is required to look for the bluish bulge at the introitus which is characteristic of an imperforate hymen. Associated haematosalpinx is related to poor prognosis [4]. An imperforate hymen is rarely associated with congenital abnormalities as in this case.

The best surgical approach would be hymenectomy under general anaesthesia. Laparotomy may also be attempted as the patient does not have haematosalpinx on MRI imaging [4].

**Differential Diagnosis List:** Haematometrocolpos due to imperforate hymen, Hydrometrocolpos, Sacrococcygeal teratoma, Anterior sacral meningocele

**Final Diagnosis:** Haematometrocolpos due to imperforate hymen

**References:**


Figure 1

Description: Ultrasound shows echogenic fluid-filled vaginal and endometrial cavity. Layering of fluid is noted. Origin: BHRUT NHS Trust, Rom Valley Way, UK

Description: Normal-sized bilateral ovaries Origin: BHRUT NHS Trust, Rom Valley Way, UK
Description: Foley's catheter within a compressed urinary bladder is noted anterior to the dilated vagina. Origin: BHRUT NHS Trust, Rom Valley Way, UK
**Figure 2**

Description: Coronal T2w image shows fluid of high signal intensity within the vagina and uterus.

Origin: BHRUT NHS Trust, Rom Valley Way, UK
Description: Axial T2w image shows dilated fluid filled mass like lesion with layering. Origin: BHRUT NHS Trust, Rom Valley Way, UK
Description: Coronal T2w image shows fluid of high signal intensity within the dilated vagina with dependent layering posteriorly. The uterus is displaced superiorly anteverted and shows fluid of high signal intensity. Origin: BHRUT NHS Trust, Rom Valley Way, UK
Description: Axial T1 fat suppressed image shows fluid of high signal intensity suggestive of hemorrhagic contents. Origin: BHRUT NHS Trust, Rom Valley Way, UK