

## MR AND ULTRASONOGRAPHIC IMAGING OF AN IMPERFORATE HYMEN WITH HEMATOMETRA AND HEMATOCOLPOS

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### ABSTRACT

Ultrasonographic and MR images of the imperforate hymen with hematocolpos and hematometra was shown in an 11-year-old girl. Turbid fluid was seen by ultrasonographic examination in the dilated uterine cavity and vaginal canal. Bright fluid on T1WI and T2WI in both cavities, indicated subacute blood. MRI also demonstrated the thickness of the imperforate hymen.

### INTRODUCTION

An imperforate hymen is the most frequent female genital anomaly. Retained secretions and menstrual blood may distend the vagina and uterus to produce hematocolpos and hematometra resulting in an abdominal mass. An underlying hematometra should be included in the differential diagnosis of a pelvic mass with primary amenorrhea (1). Both ultrasonography and MRI study confirm the clinically suspected this pathology.

### CASE REPORT

An eleven-year-old girl had lower abdominal pain for two weeks. A firm mass, size about 20 weeks pregnancy, was palpated at the lower part of the abdomen. She denied a transvaginal examination. She still had no menstruation. The secondary sex characteristics such as breast enlargement, and axillary hair was observed. Transvesical ultrasonography of the pelvic cavity revealed distended uterus and vagina with turbid fluid (Fig.1). The uterus and vagina had mildly thickened wall. MRI was performed to

confirm the diagnosis of hematocolpos and hematometra. Axial and sagittal T1W images of the pelvic cavity showed distended uterine and vaginal cavity with hypersignal content, the content was as bright as the subcutaneous fat. The content was brighter on sagittal and coronal views T2W images (Fig.2). The grey signal membrane, 1 cm. thick was noted at sagittal T2W image.

An imperforate hymen was found and was excised. A considerable amount of bloody fluid was drained (Fig.3).

### DISCUSSION

Normally the hymen originates from the urogenital sinus at the origin of the embryonic vagina. An imperforate hymen occurs if a normal lumen fails to develop (1-4). A simple imperforate hymen is usually not associated with other congenital abnormalities (5-7).

Obstructed uterovaginal anomalies most frequently become manifest at puberty, when the onset of menses results in the accumulation of

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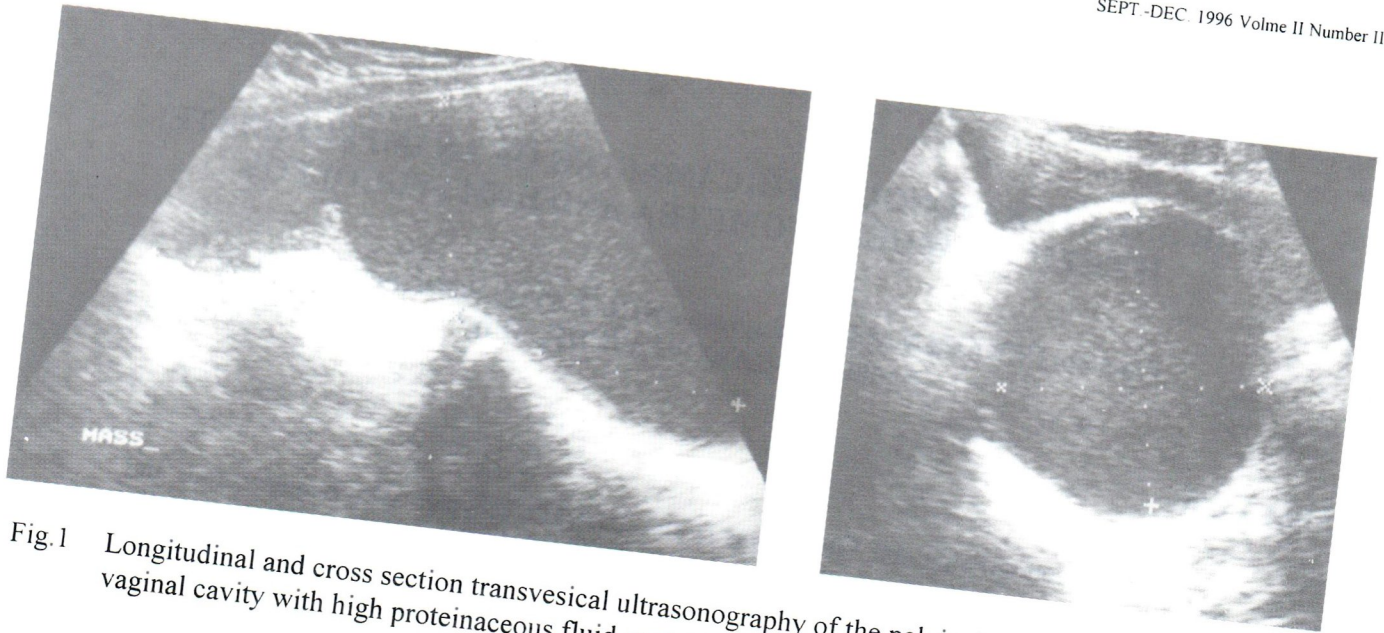


Fig.1 Longitudinal and cross section transvesical ultrasonography of the pelvis showed distended uterine and vaginal cavity with high proteinaceous fluid content.

menstrual blood and secondary distention of the vagina and/or uterus. Uterovaginal anomalies are best classified into three groups (8,9). The first group is agenesis of the uterus and vagina or Mayer-Rokitansky-Kuester-hauser syndrome, and is due to a dysplasia of the Muellierian ducts with absence of the normal uterus and most or all of the vagina. An active uterine anlage with functioning endometrial tissue may be present, resulting in a unilateral hematometra. The second group consists of disorders of vertical fusion, or faults in the junction between the down-growing muellierian ducts and up-growing derivative of the urogenital sinus, and includes transverse vaginal septum and congenital absence of the cervix and much of the vagina with a normal uterus. Imperforate hymen, while not a muellierian anomaly, is another cause of a low vaginal obstruction that must be distinguished from a transverse vaginal septum. The third group, disorders of lateral fusion, result from failure of lateral fusion of the two muellierian ducts or failure of absorption of the uterine septum. When vaginal obstruction occurs, it is usually unilateral.

A large amount of blood can also accumulate in the fallopian tubes resulting in hematosalpinx and secondary infection may lead to closure of the tubes.

Before menstruation, the accumulation of secretions in the vagina and uterus is referred to as hydrometrocolpos. Following menstruation, hematometrocolpos results from the presence of retained menstrual blood (10). If seen before puberty, the accumulation of secretions is anechoic. Following menstruation, the presence of old blood results in echogenic material within the fluid, as in our case. There may also be layering of the echogenic material, resulting in a fluid-fluid levels.

The ability of diagnose the presence of blood reliable in virtually any body part or tissue and to characterize the relative age of blood is unique to MR imaging. In this regard the magnetic susceptibility effect of the diamagnetic deoxyhemoglobin present within red blood cells in acute hemorrhage has a pronounced effect on T2 proton relaxation and is manifested as prominent hypointensity particularly on long TR/long TE imaging sequences at high-field strengths. Shortening of T1 in subacute and chronic hematomas has been attributed to the paramagnetic effects of methemoglobin (11,12). The menstrual products within the hematocolpos should be a combination of acute, subacute and chronic blood produced at different monthly periods. Sagittal images also showed the thickness of the imperforate hymen.

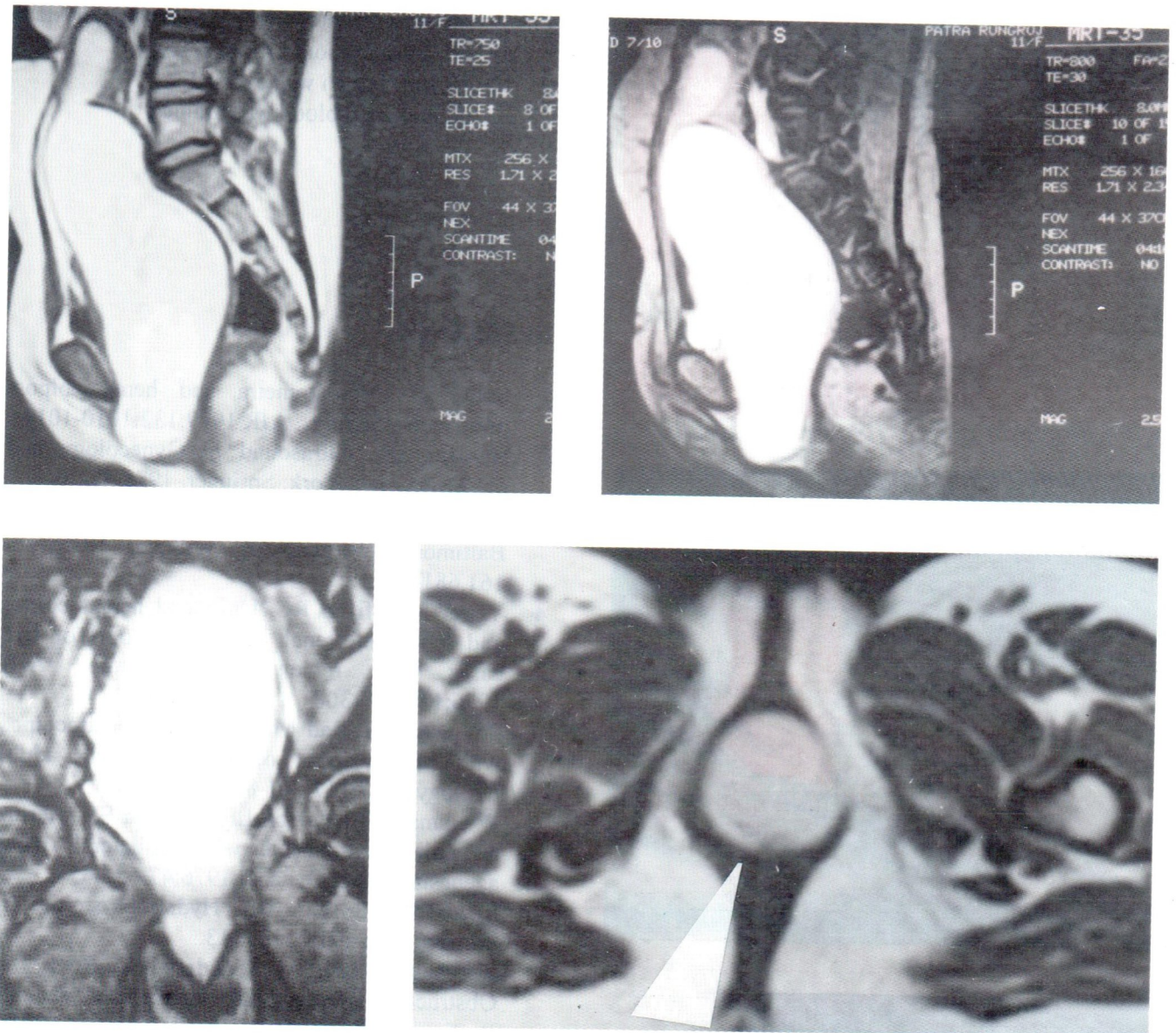


Fig.2 MR images of the distended uterine and vaginal cavity with subacute blood in sagittal and axial T1W and in coronal T2W. The fluid is bright on T2WI and brighter on T1WI and is homogeneous in signal. The arrow shows the imperforate hymen.

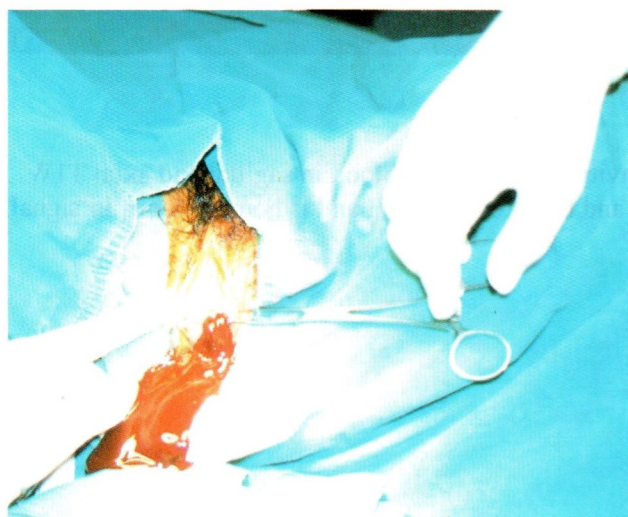
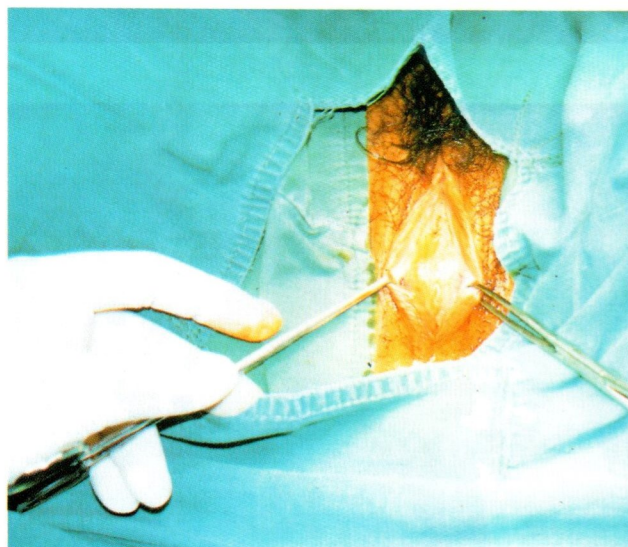


Fig.3 (A) imperforate hymen was seen at physical examination prior to surgery  
(B) the hymen was excised  
(C) retained blood was drained

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