Fetal ultrasound diagnosis allows effective early postnatal treatment of hematometrocolpos

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Abstract

Fetal hematometrocolpos is a rare finding with an incidence of 1 in 16,000 female births. Timely diagnosis enables clinicians to formulate an appropriate management plan for the newborn. We present a case of fetal hematometrocolpos managed exclusively by prenatal and postnatal ultrasound scans allowing for effective immediate postnatal surgical treatment.

Clinical case report

Fetal ultrasound diagnosis allows effective early postnatal treatment of hematometrocolpos

Running title: Fetal hematometrocolpos

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Abstract

Fetal hematometrocolpos is a rare finding with an incidence of 1 in 16,000 female births. Timely diagnosis enables clinicians to formulate an appropriate management plan for the newborn. We present a case of fetal hematometrocolpos managed exclusively by prenatal and postnatal ultrasound scans allowing for effective immediate postnatal surgical treatment.

Key Clinical Message

Our case highlights that cross-sectional imaging is not mandatory for successful management of fetal hematometrocolpos. This is of great significance in low resource healthcare settings, where access to fetal MR may not be readily available.

Keywords: abdominal mass, imperforate hymen, prenatal diagnosis

Introduction

Hematometrocolpos is defined as the accumulation of blood or menstrual fluid in the uterus and vagina due to obstruction. While obstruction can be caused by various pathologies in adulthood, such as malignancies or adhesions secondary to infection or surgical procedures, the most common cause in childhood and adolescence is congenital anomalies, such as imperforate hymen or a transverse vaginal septum.[1] Occasionally, the accumulation of fluid in the uterine cavity begins in fetal life and can be identified prenatally. Fetal hematometrocolpos is a rare finding with a reported incidence of 1 in 16,000 female births.[2]

Timely diagnosis before delivery is crucial as it enables clinicians to formulate an appropriate management plan for the newborn, avoiding unnecessary investigations and enabling surgical intervention within the first few days of life. This is advantageous for early resolution of the lesion and significantly reduces the chances of complications resulting from delayed diagnosis and treatment.

Here we present a case of fetal hematometrocolpos diagnosed and followed up exclusively by prenatal and postnatal ultrasound scans allowing for effective immediate postnatal surgical treatment, evidenced by full resolution by three months of age.

Case presentation

We present a term baby girl born to a 35-year old Caucasian woman in her first pregnancy with an uneventful medical history. Informed consent was obtained prior to publication.

Dating (12 weeks of gestation) and anomaly (20 weeks of gestation) scans were reported as normal. A growth scan was requested at 35 weeks 6 days of gestation due to a low maternal BMI of 17.84 kg/m^2. Normal fetal movements were reported and there were no maternal concerns at the time of this scan.

The growth scan revealed that although the umbilical artery Doppler was normal, the estimated fetal weight was below the fifth centile. The liquor volume was adequate with a maximum pool depth of 7 cm and satisfactory fetal movements were seen. A well-rounded mass containing low level echoes was identified in the fetal pelvis superior and posterior to the urinary bladder. The fetal urinary bladder, kidneys and the stomach were demonstrated and appeared normal. No obvious mass pressure effect was seen in the fetal abdomen.

As per hospital protocol, the woman was referred to the Fetal Medicine Department for a further scan which identified a 3.5 x 3.7 x 8 cm solid mass in the abdomen behind the bladder and in the midline, most likely representing an enlarged uterus in this female fetus. The external genitalia, renal tract and bladder appeared normal. The scan confirmed that the fetus was small for gestational age. No other structural abnormalities were seen within limits of late gestational age and a probable diagnosis of a fetal hematometrocolpos was made (Figure 1A).

The woman was counselled about the findings, and a plan was made for baby to have a postnatal abdominal ultrasound scan to confirm the diagnosis and to be transferred to the surgical centre at the [blinded] Hospital for intervention. Since these findings are usually not associated with underlying chromosomal or genetic problems, amniocentesis was not offered. Increased surveillance was arranged because of the growth restriction with serial growth scans.

The baby was born in good condition vaginally by forceps assisted delivery following induction of labor at 39 weeks of gestation with a birth weight of 2625 grams. On physical examination, a protruding vaginal mass was noted, with no signs of ulceration or infection. Both femoral pulses were felt with difficulty, but there was good distal perfusion to both legs. The rest of the physical examination was unremarkable. Baby was passing urine and opening her bowels normally. Her renal function parameters were normal.

An ultrasound of the baby's abdomen and pelvis was performed on the day of birth confirming a thin walled cystic structure filling the pelvis and extending up to the umbilicus and bilaterally into both adnexae (Figure 1B). The structure measured 7.3 x 3.1 x 6 cm and contained echogenic fluid. There was no internal vascularity demonstrated. At the superior border of the structure, a lobulated, more solid looking focus measuring 16 x 8 x 13 mm with elements of shadowing was described, suggested to be possible calcification,

also with no internal vascularity. It was not possible to identify a vagina. The liver, spleen and kidneys had normal appearances and there was no hydronephrosis. The urinary bladder was virtually empty and only seen low in the pelvis and anterior to the cystic mass. The femoral vessels were patent. Overall, appearances were suggestive of a hematometrocolpos with a possible small clot at the fundal aspect.

The baby was transferred to the [blinded] Hospital and had surgery under general anesthesia on the third day of life which involved incision of the imperforate hymen and drainage of the hematometrocolpos, followed by a cystovaginoscopy which was normal. She was discharged home the following day. A repeat abdominal ultrasound scan was performed at three months of age, showing no recurrence (Figure 1C). The pre-pubertal uterus was normal with no fluid seen, as were the ovaries and bladder.

Discussion

Fetal hematometrocolpos is usually an incidental finding during routine antenatal ultrasound scans. There are no known risk factors, and the diagnosis usually becomes more apparent at later stages of pregnancy, with the increasing size of the lesion.

Most reports of fetal hematometrocolpos describe a pear-shaped cystic mass with fluid-debris level in the fetal pelvis posterior to the bladder and anterior to the rectum and most are diagnosed after 32 weeks of gestation,[3,4] however Winderl et al. reported a case at 25 weeks of gestation which appears to be the earliest fetal diagnosis in the literature.[5]

Due to the low incidence of fetal hematometrocolpos, the associated ultrasound findings often prompt clinicians to request further imaging, mostly fetal MR scans to clarify the diagnosis and the extent of the lesion.[4] However, this is not always feasible, particularly in low resource healthcare settings or at advanced gestational age. On the other hand, timely diagnosis, preferably before delivery, provides great advantage to the paediatrician to arrange for appropriate postnatal surgical management of the neonate in a paediatric surgical centre with relevant experience.

While hematometrocolpos in the neonate is not life threatening per se, delayed diagnosis and intervention can lead to unnecessary investigations and, depending on the size of the lesion, can cause obstruction in the urinary tract or compromise perfusion of the lower limbs due to the external pressure effect on surrounding tissues.

In our case, accurate ultrasound diagnosis allowed us to organize timely surgical management, resulting in full resolution of the hematometrocolpos with no reaccumulation at three months of age. Importantly, from the imaging point of view, this case was managed entirely aided by ultrasound scans, indicating that cross-sectional imaging is not mandatory for successful management of these patients. This is of great significance in low resource healthcare settings, where access to fetal MR may not be readily available.

References

1. Smith RP. Netter's Obstetrics and Gynecology. 2nd ed. Philadelphia, PA: Saunders Elsevier; 2008.
2. Benson CB, Doubilet PM. The fetal genitourinary system. In: Fleischer AC (ed). Sonography in Obstetrics and Gynecology. 1st ed. London, UK: Prentice-Hall International; 1996:444–450.
3. Hasan M, Saba E. Prenatal ultrasonographic diagnosis of hydrometrocolpos. J Med Ultrasound 2010;18:81–84.
4. Garcia Rodriguez R, Pérez González J, Garcia Delgado R, et al. Fetal hydrometrocolpos and congenital imperforate hymen: Prenatal and postnatal imaging features. J Clin Ultrasound. 2018;46:549–552.
5. Winderl LM, Silverman RK. Prenatal diagnosis of congenital imperforate hymen. Obstet Gynecol 1995;85:857–860.

Figure legend

Figure 1. Hematometrocolpos diagnosed in a fetus at 35 weeks of gestation. A. Antenatal transverse ultrasound scan showing the fetal pelvic mass between the calipers (3.67 cm). B. Postnatal longitudinal ultrasound scan of the baby's pelvis confirming the hematometrocolpos on the day of birth. C. Longitudinal

ultrasound scan of the baby's pelvis at three months of age showing normal anatomy and complete resolution of the hematometrocolpos. The uterus is shown between the calipers (2.57 cm).