CASE REPORT

Sonography of Meconium Periorchitis in the Neonate

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Abstract

Occurrence of a scrotal mass in a newborn or young child often requires additional evaluation, the extent of which depends on the clinical scenario. We present a case of a newborn infant that presented with non-tender bilateral scrotal swelling that was prenatally suspected to be meconium periorchitis, a diagnosis confirmed by postnatal surgical exploration. Understanding the sonographic characteristics associated with meconium periorchitis help to allow for appropriate management of the patient and guide surgical evaluation.

Keywords: Meconium, Periorchitis, Neonate, Hydrocele, Sonography

INTRODUCTION

Scrotal mass presentation in an infant or young child is a finding often related to hydrocele or bowel herniation; however, scrotal masses of both benign and malignant etiology need to be excluded. First-line imaging is ultrasound (US). In this case study, we report a 1-day-old male who presented with bilateral scrotal mass with presumed diagnosis of suspected meconium periorchitis that was pathologically confirmed following surgical exploration.

CASE REPORT

A 1-day-old male was born at 38+2/7 weeks to a 22-year-old G2P2 female through spontaneous vaginal delivery without any delivery complications with a birth weight of 3724 g. Physical examination revealed non-tender bilateral scrotal swelling. Prenatal US raised suspicion of meconium periorchitis given the mixed echogenic masses seen in the fetal scrotum, presumably from intrauterine meconium peritonitis. As a result, after birth, the infant was transferred to a tertiary care neonatal intensive care unit for higher level care. Postnatal abdominal radiographs revealed moderate pneumoperitoneum, confirming the suspicion of prenatal gastrointestinal (GI) perforation. However, the subsequent upper GI examination revealed intact bowel without evidence of leak. Serial abdominal radiographs confirmed resolution of abdominal free air. Oral feeding was initiated and tolerated well. Laboratory workup for cystic fibrosis (CF) was negative. The patient was discharged home with follow-up surgical consultation and sonography of the scrotum for the persistent non-tender scrotal swelling.

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Imaging findings

Sonography of the scrotum confirmed two normal homogenous testicles with appropriate internal color Doppler flow and no evidence of testicular torsion. However, both testicles were

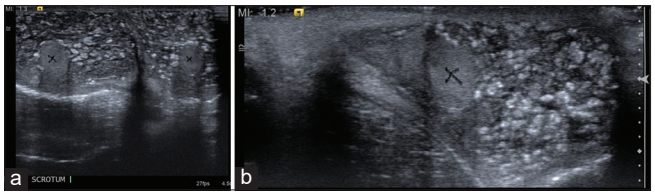

Figure 1: (a) A newborn male with bilateral scrotal swelling. Transverse scrotal sonographic view confirms two normal testicles (X) surrounded by heterogeneous hydrocele. (b) A newborn male with bilateral scrotal swelling. Sagittal scrotal sonographic view confirms one normal testicle (X) surrounded by heterogeneous hydrocele.

enveloped by a heterogeneous/complex hydrocele with an echogenic nodular appearance with intermittent acoustic shadowing [Figure 1]. Scattered, limited color Doppler flow was seen within the hydrocele bilaterally. No herniated bowel was identified. The sonographic appearance is compatible with calcifications associated with meconium periorchitis.

Pathologic examination

Due to clinical concern for inguinal hernia and uncertain long-term complication from the meconium hydrocele, the surgeon elected for bilateral inguinal and scrotal exploration for potential hernia repair and hydrocele evacuation. Bilateral hernia sacs were identified, resected, and sent to pathology along with the evacuated meconium [Figure 2]. Microscopic pathologic evaluation confirmed reactive and irritated hernia sacs associated with meconium and calcified fecal debris.

Patient follow-up

One year post-procedure, the patient is doing well and developing normally.

DISCUSSION

Intrauterine bowel perforation can be a spontaneous event or associated with abnormalities such as CF or bowel obstruction/atresia. The resulting spillage of fetal meconium into the peritoneal cavity results in meconium peritonitis which occurs with a frequency of 1 in 35,000 births.[1] In addition, meconium peritonitis can be seen in 15% of infants with CF.[2] Commonly, the bowel perforation will spontaneously seal off resulting in an intact bowel at birth but the resulting spilled peritoneal meconium causes an inflammatory response, which can subsequently manifest as scattered peritoneal abdominal calcifications that are typically of no clinical significance. However, due to the patent processus vaginalis (a fetal outpouching of the peritoneum that extends into the scrotum), this extruded meconium can stream into the scrotal sac, enveloping the testicles resulting in meconium periorchitis.[3]

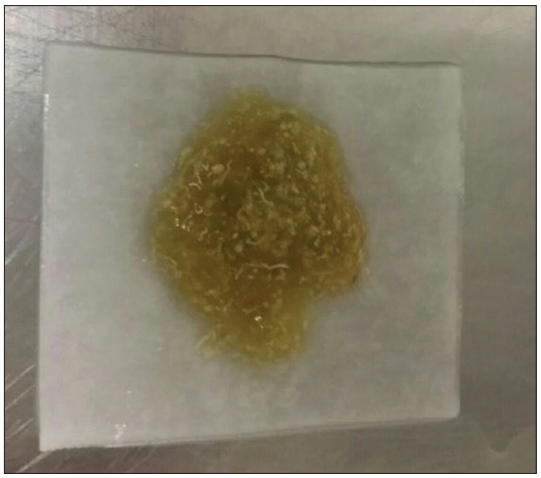

Figure 2: Gross pathologic photograph of evacuated meconium hydrocele.

Once present in the scrotum for an extended period of time, the meconium can harden, calcify, and develop fibrosis that on palpation can mimic a scrotal tumor. Both the masses and calcifications of meconium tend to resolve spontaneously without compromising the testicle.[4] Initially, the presence of meconium in the scrotum results in a soft hydrocele that can be difficult to diagnose, only later presenting as hard scrotal swelling.[3] Patients are typically diagnosed in the 1st week/month of life, but meconium periorchitis has been reported in children up to 5 years of age.[4]

If a scrotal mass is palpated, further evaluation with imaging is performed with US which can help evaluate for benign versus potential malignant etiologies. The presence of abdominal calcifications in addition to scrotal calcifications (extratesticular) on abdominal radiography strongly suggests the possibility of meconium peritonitis in the appropriate clinical setting which commonly results following intrauterine bowel perforation.[5] A palpable solid mass within the testicle raises the possibility for other etiologies. Scrotal sonography is a valuable modality allowing the clinician to help distinguish meconium periorchitis from a neoplastic process. The differential ability that sonography offers between benign extratesticular lesions and malignant testicular lesions highlights its usefulness.[4]

Sonographic findings of meconium periorchitis in the newborn period typically demonstrate a mixed echogenic scrotal hydrocele with numerous internal punctate echogenic foci, some with posterior shadowing indicative of calcifications, surrounding the otherwise normal-appearing testicle.[3,5] Absent color Doppler flow within the meconium hydrocele indicates non-vascular tissue which supports the diagnosis of meconium periorchitis.[4,6] However, as in our case, some scattered color Doppler flow has been reported within the meconium hydrocele, likely from localized scrotal inflammatory response.[1,7]

Once the meconium hardens overtime, it may appear as multiple hyperechoic masses adjacent to the testicle with scattered shadowing calcifications.[5] Any accompanying clinical or sonographic findings consistent with meconium ileus, peritonitis, intestinal atresia (such as fetal echogenic bowel and polyhydramnios), dilated bowel loops, ascites, or pseudocyst may also help to clarify the diagnosis of meconium periorchitis.[7]

Proper identification of benign meconium periorchitis is important because such a diagnosis supports a conservative approach. Spontaneous resolution is the expected natural evolution of this benign lesion with asymptomatic postnatal course.[2,8] Unfortunately, the concern for calcifying scrotal neoplasm (such as teratoma, Sertoli cell tumor, or metastatic neuroblastoma) can lead to unnecessary surgical exploration and orchiectomy.[4] Despite the benign nature of meconium periorchitis, past studies indicated that unnecessary orchiectomies were performed in 18% of cases.[4] In addition, the strong association of CF with intrauterine spillage of meconium likely warrants CF screening when encountering a case of meconium periorchitis.[5,6]

CONCLUSION

In this case study, we have explored a case of non-tender bilateral scrotal swelling that on sonographic examination, presented as a heterogeneous, nodular hydrocele that surrounded the otherwise normal-appearing testicles. The distinctive sonographic and clinical features in the neonate of this entity presented here allow for an accurate diagnosis of meconium periorchitis that merits conservative, non-surgical management.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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