Axial torsion of Meckel’s diverticulum presenting as a pelvic mass

Abstract  Meckel’s diverticulum is the most common congenital gastrointestinal anomaly. Axial torsion of the diverticulum is rare and may produce nonspecific abdominal signs and symptoms. We describe a case of torsion of a Meckel’s diverticulum that was noted as a pelvic mass on CT images.

Introduction
Meckel’s diverticulum is the most common congenital gastrointestinal anomaly, representing the failure of the ileal connection of the omphalomesenteric duct to completely close during embryonic development. The prevalence is approximately 2%, and the vast majority (> 80%) of patients are asymptomatic [1]. The most common presentation in children is painless rectal bleeding, while intestinal obstruction is more common in adults [1]. Complications include bowel strangulation, intussusception, volvulus, incarceration within a hernia, and neoplasm [1]. Radionuclide studies with unlabeled Tc-99m allow the detection of ectopic gastric mucosa within a Meckel’s diverticulum and are commonly performed to evaluate rectal bleeding in children, with a sensitivity of 85% and a specificity of 95% [1]. Other presentations of Meckel’s diverticulum are much less dependent upon the presence of ectopic mucosa, and modalities such as CT and US are needed for diagnosis [2].

Axial torsion of the diverticulum is rare and may produce nonspecific abdominal signs and symptoms. Recently, a sonographic report described a child with axial torsion of a Meckel’s diverticulum [3]. We describe a case of torsion of a Meckel’s diverticulum that was noted as a pelvic mass on CT images. Definitive anatomic relationships were noted at the time of surgery, and surgical pathology confirmed the diagnosis.

Case report
A 14-year-old boy presented with a 5-day history of intermittent periumbilical abdominal pain that had become constant and more severe over the last 24 h, accompanied by nausea and vomiting. The patient reported that he had passed a normal bowel movement that morning and denied urinary tract symptoms. Temperature was 37°C with a leukocyte count of 6,900/mm³. On physical examination, the abdomen was soft, non-distended, and no masses were palpated.

CT demonstrated a tubular fluid-filled structure 1 cm in diameter extending inferiorly from the right lower quadrant of the abdomen to a loculated cystic mass, 6 cm in diameter, located between the rectum and the bladder (Fig. 1a–c). The walls of the mass did not enhance following contrast injection. A small amount of free fluid was present in the pelvis. The appendix was not specifically identified. Despite the normal leukocyte count, the fluid-filled mass was thought to be suggestive of an abscess, possibly secondary to a subacute ruptured appendicitis.

Exploratory laparotomy revealed that the pelvic mass was an elongated and distally distended Meckel’s diverticulum that had twisted upon itself. The tubular component of the mass was the nonobstructed segment above. The appendix was identified separately and was resected along with the fluid-filled mass. Pathology reported a normal appendix and a Meckel’s diverticulum with focal ulceration, vascular congestion, and evidence of acute and...
Fig. 1 a–c Axial images from contrast-enhanced CT. a Contrast is opacifying each ureter (arrows). A rounded fluid-filled structure in the right lower quadrant has little mass effect. There is no edema in the adjacent fat. b A crescentic midline tubular structure has thickened walls which enhance slightly when compared to nearby bowel loops. c The bladder (β) has a tiny amount of contrast layering along the dependent posterior wall. The posterior wall is extrinsically compressed by the fluid-filled mass (M) shown on serial sections to be in continuity with the fluid-filled structures above. The contrast-filled ureters are lateral to the mass. Small fluid collections are present posterior to the mass.

chronic inflammation. Gastric mucosa was not present within the diverticulum. The patient had a benign hospital course and was discharged on the second postoperative day.

Discussion

The nonspecificity of this child’s clinical presentation, physical examination, and laboratory tests indicated that appendicitis was an unlikely diagnosis. How then to proceed?

In many instances, no imaging is performed. Plain radiographs have low diagnostic yield in the setting of abdominal pain without other abnormality but are still frequently performed. Sonography is usually ordered when the diagnostic considerations include appendicitis, intussusception, or adnexal pathology. CT is, in many institutions, the preferred modality to study children with atypical abdominal pain, such as this child who had increasing abdominal pain over 5 days. A recent study of patients with atypical presentations of appendicitis demonstrated a sensitivity of 97% and a specificity of 100% for CT, while sonography had a sensitivity of 76% and a specificity of 90% [4]. In pediatric patients helical CT has shown similar results and, additionally, has supplied an alternative diagnosis for 34% of those patients in whom appendicitis was ruled out [5]. However, increasing concern about the long-term consequences from the radiation of CT [6] may cause a shift away from this modality, even when age-specific lower dose techniques are used [7].

Torsion of a Meckel’s diverticulum is a rare complication. Its appearance in this child is different from that shown in other case reports. A sonographic report [3] described a torred diverticulum in a child. It was in a subhepatic location, had a wall with concentric layers, and was associated with a small amount of free peritoneal fluid. A prior report [8] described the appearance of a torred and gangrenous Meckel’s diverticulum in an adult. It was anterior to the bladder, did not have a thick wall, and contained both fluid and air. Our case demonstrates that the torred diverticulum can enter yet another potential space, can be completely fluid filled, and again be associated with a small amount of free fluid.