Ischemic Volvulized Meckel's Diverticulitis in a Previously Healthy Boy

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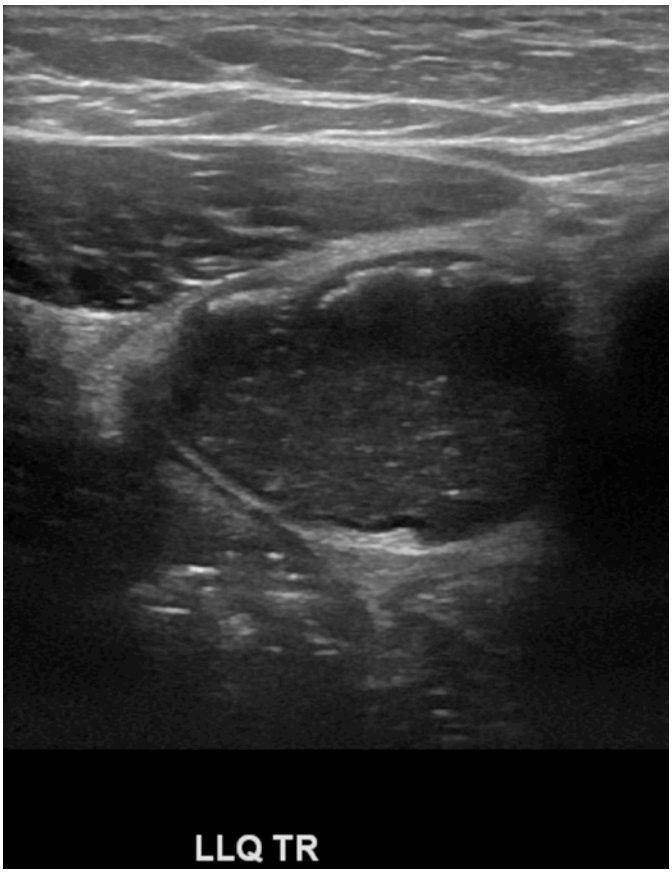
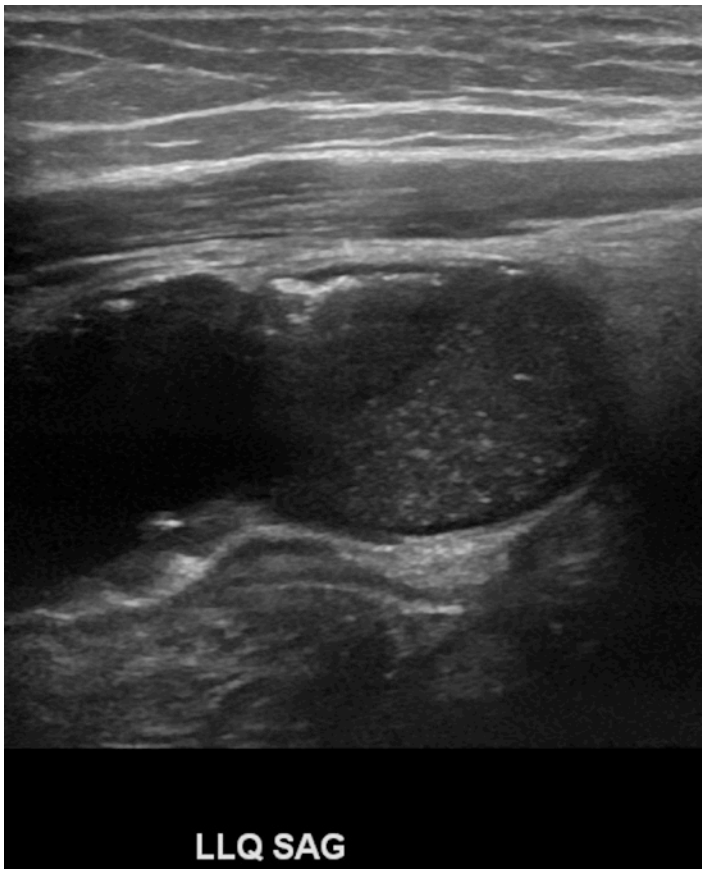
A 10-year-old boy with a past medical history of attention deficit hyperactivity disorder treated with dexmethylphenidate presented to the pediatric emergency department with 24 hours of suprapubic lower abdominal pain and emesis. He had a normal bowel movement that morning with no rectal bleeding. Temperature was 99.5° F. White blood cell count was 18,700/mm^3. On exam he had nonradiating tenderness in both lower quadrants with guarding.

Ultrasound (Figures 1 and 2) did not identify an appendix but demonstrated a fixed, noncompressible, dilated, blind-ending 4.7 x 2.2 cm tubular hypoechoic structure subjacent to the anterior wall of the left lower quadrant. The structure demonstrated an irregular internal wall and a normal gut signature of hyperechoic mucosa/submucosa and hypoechoic muscularis propria, with no wall thickening and no vascularity on color Doppler sonography. The lumen contained heterogeneous debris, anechoic fluid and shadowing gas. There was surrounding echogenic fat and tenderness to transducer pressure. CT scan (Figures 3 and 4) revealed a blind-ending, tear-drop shaped tubular structure extending from ileal loops in the midline to the left anterior abdominal wall, containing minimal luminal gas and slightly hyperdense fluid. There was no wall thickening or enhancement. There was surrounding fat stranding and free fluid. A normal appendix was identified to the right of midline. The differential diagnosis included enteric duplication cyst or Meckel's diverticulitis.

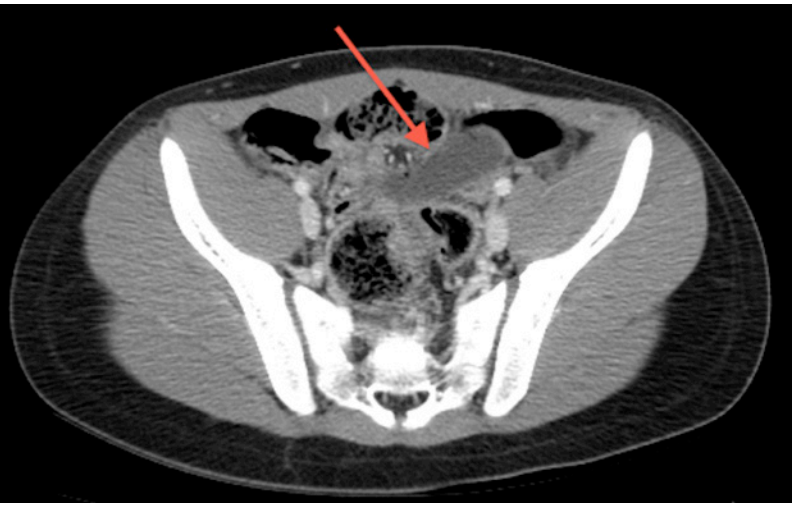
Open exploration resulted in resection of a 6-7 cm large, blind-ending tubular structure approaching the mesenteric side of the ileum. The structure was not contained in serosa and appeared ischemic but not perforated. Some small bowel loops appeared volvulized around the structure resulting in

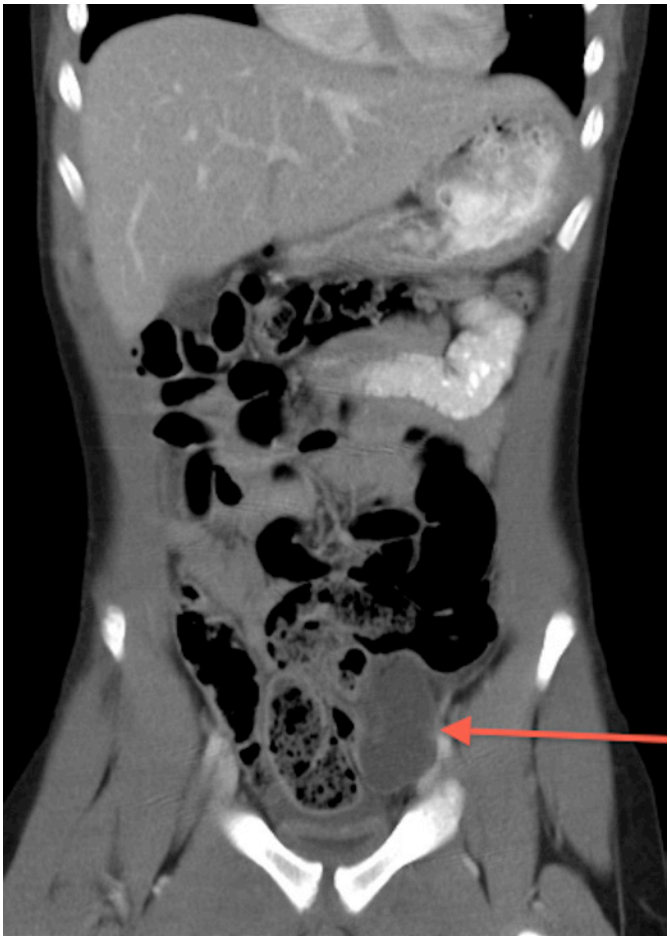
Figures 1 and 2





Figures 3 and 4





partial obstruction. A normal appendix was resected. The patient was discharged on postoperative day 5.

Pathology reported an 8.5 x 3.0 x 2.7 cm diverticular outpouching filled with clotted blood, appearing necrotic, with a grey-green serosa, a 0.1-0.3 cm thick wall and hemorrhagic and denuded mucosa consistent with volvulus of a Meckel's diverticulum.

DISCUSSION

Meckel's diverticulum (MD) is the most common congenital anomaly of the gastrointestinal tract, representing failure of closure and disintegration of the omphalomesenteric duct. MD is a true diverticulum, containing 3 layers of gastrointestinal wall, usually connected to the antimesenteric ileal border 40-100 cm proximal to the ileocecal valve.[1] It may be up to 10 cm long and 2 cm wide.[2] 50% contain heterotopic mucosa, of which 60% is gastric.[1] The estimated incidence is 2% and 4-25% of patients will have symptomatic complications, with 60% presenting before age 10.[3]

Classically, MD presents with painless rectal bleeding, especially in children below 2 years of age.[1] However, 35-80% of children may present without bleeding, especially older children.[1,4] Of all patients, 30-40% are estimated to present with intestinal obstruction and 20-30% with diverticulitis without hemorrhage.[1,2,5] Inflammation may be secondary to acid production from ectopic gastric mucosa, orifice obstruction, diverticular torsion or intestinal volvulus around the MD.[2,5] There may be secondary ischemia. Perforation may be a late complication.[6] In a study of pediatric patients with symptomatic MD by Baldisserotto et al., 60% presented with nonspecific clinical signs mimicking appendicitis, including abdominal pain, guarding, fever and vomiting.[2] Unlike appendicitis, the location of maximal abdominal tenderness may be in the mid-abdomen or left lower quadrant.[3]

Meckel's diverticulitis can be identified on ultrasound by visualizing a cyst-like mass with a thick wall with a gut signature. The shape can be tubular, sac-like, teardrop shaped or rounded. The cyst-like appearance and gut signature is also seen with an enteric duplication cyst, but the internal wall of MD will be thicker and more irregular and a tear-drop shape will be more specific.[4] MD can also be visualized on CT as a blind-ending sac. The size and wall thickness may vary. Mural enhancement is seen except in cases of ischemia and gangrene. The lumen may be filled with air, fluid and particulate matter, but not oral contrast. The surrounding mesentery may be inflamed with free fluid.[1] Visualizing a normal appendix on either ultrasound or CT excludes appendicitis. Unlike appendicitis, the location of MD will be more variable, with most near the midline rather than in the right lower quadrant.[1]

Meckel's diverticulitis is uncommon but not rare in children and adults and should be included in the differential diagnosis of acute abdominal pain. With careful scrutiny of ultrasound and CT, correct preoperative diagnosis is possible.

References

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Disclosures

The author and/or significant other have no financial interests to disclose.

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