Preoperative Sonographic Diagnosis of Appendiceal Intussusception: A Case Report

Mehdi Alehossein, MD, Houman Alizadeh, MD, Hedayatolah Nahvi, MD, Ahmad Reza Ghasemi Esfe, MD, Seyed Mehran Vaziri Bozorg, MD

Bahrami Children Hospital, Tehran University of Medical Sciences, Damavand Street, Tehran, Iran

Received 19 September 2008; accepted 1 April 2009

ABSTRACT: Appendiceal intussusception is an uncommon form of intussusception. Most of the literature regarding appendiceal intussusception discusses the colonoscopic diagnosis or surgical treatment of the condition. Sonographic findings have rarely been described. We present a case of preoperative sonographic diagnosis of appendiceal intussusception. © 2009 Wiley Periodicals, Inc. J Clin Ultrasound 37:363–365, 2009; Published online in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/jcu.20594

Keywords: appendix; intussusception; sonography; pediatrics

Appendiceal intussusception is a rare type of intussusception with an incidence of 0.01% in children and adults. It is seen more often in boys than in girls. The clinical and radiographic signs of this group differ from classic intussusception of early childhood with a mean age at presentation of 5–9 months. Whereas many articles have described the sonographic appearance of ileocolic intussusception, there are few publications on the sonographic findings in appendiceal intussusception. A definite preoperative diagnosis of appendiceal intussusception is even rarer.

CASE REPORT

A 7-year-old boy presented to our hospital with a 2-week history of intermittent colicky abdominal pain. There was no vomiting, abdominal distention or obstipation. He had normal development and no systemic complaint. Physical exam revealed mild tenderness at deep palpation of right lower quadrant. Laboratory findings and abdominal X-rays were within normal limits. He was referred to the radiology department for abdominal ultrasound (US) examination. Abdominal US was performed with a Sonoline G50 scanner, a 5-MHz sector, and a 10-MHz linear–array transducer (Siemens Ultrasound, Mountain View, CA). It revealed definite signs of intussusception in the cecal area appearing as multiconcentric ring signs (Figures 1 and 2). US-guided saline enema was performed to reduce intussusception. There was no change in the sonographic findings in spite of the general good condition of the boy who did not have any abdominal complaint. Therefore, the patient was placed under close observation in the surgical ward. Two days later, follow-up US showed persistent signs of intussusception with a doughnut-shaped structure within the cecum, while the boy remained clinically stable and nearly asymptomatic. This discrepancy between sonographic findings and clinical states was unusual for classic intussusception. A careful examination of the sonograms showed that the terminal ileum, ileocecal valve, and a portion of the appendix vermiformis were nicely delineated (Figure 3). We concluded that most of the appendix had invaginated into the cecum. A contrast enema confirmed that there was no filling of the appendix and no backwash of contrast into the terminal ileum (Figure 4).

Four days following admission, the child underwent surgery with a preoperative diagnosis of appendiceal intussusception. Using a transverse incision in the right lower quadrant, the cecum was exposed and two-thirds of the appendix were found to be intussuscepted into the cecum.
The distal appendiceal tip was club-shaped. Manual reduction of the appendix was successful only after cutting the mesoappendix. Then the reduced appendix was resected at its base and the cecum closed. There was no evidence of a pathologic lesion within the small bowel or appendix. The resected appendix measuring 7 cm in length and 1.5 cm in width was covered by congested vessels. In cross section, lumen contained fecaloid material. There was no lead point. The boy was discharged from hospital 8 days following admission in good condition.

**DISCUSSION**

Intussusception is not uncommon in infants and children. Most of these patients present between
the ages of 6 months and 2 years and exhibit well–known clinical and radiographic findings such as sudden onset of colicky pain, vomiting, a palpable abdominal mass, blood in the stool and the target, and pseudokidney signs on US. US is the imaging modality of choice for the diagnosis of intussusception with sensitivity and specificity up to 100%. In contrast, appendiceal intussusception is uncommon and rarely reported. Most cases occur in children younger than 10 years of age. The presentation is often with vague, crampy, intermittent abdominal pain. It may also be asymptomatic or may mimic acute appendicitis. It must be included in the differential diagnosis for compound intussusception secondary to pathologic lead point. Our case was type II appendiceal intussusception according to McSwain classification. Most of the literature regarding appendiceal intussusception discusses the colonoscopic and surgical treatment options of this condition. In colonoscopy, the appearance is described as a polyoid or mushroom like-lesion with a central dimple found in the anatomic location of the appendix.

On barium enema, an oval, round (in case of partial invagination), or finger-like filling defect (in complete invagination) is demonstrated at the tip of the cecum. The classic coiled spring appearance in appendiceal intussusception is more obvious on double contrast barium enema. Appendicidal intussusception has been described with a target, layered, sausage-shaped, or reniform appearance on CT; when present, this appearance is virtually pathognomonic. There are few sonographic reports of appendiceal intussusception. It may appear as the multi-concentric ring sign on transverse scans while longitudinal sonograms may show the inverted appendix protruding into the cecal lumen. An inverted Meckel’s diverticulum with or without intussusception may also have a finger-like or club shape. However, it is located at distal ileum, not cecum. Other rare differential diagnoses include inverted appendicetal stump, appendiceal abscess and duplication cyst. Our case was definitely diagnosed on sonography by following the club-shaped blind-ended intussusception to the anatomic location of the appendix vermiformis and also by reverifying the normal ileocecal valve, which excluded an ileocolic intussusception. If US findings are highly suggestive of an appendiceal intussusception, surgical intervention and appendectomy should be performed without waiting for hydrostatic enema reduction because the inverted appendix may act as a lead point for a secondary intussusception.

REFERENCES