Pediatric Concurrent acute appendicitis and ileocolic intussusception in a 1-year-old child

Lauren Marjon MD*, Nathan Hull MD, Kristen Thomas MD

Department of Radiology, Mayo Clinic, 200 1st St SW, Rochester, MN 55902, USA

ARTICLE INFO

Article history:
Received 26 January 2018
Accepted 8 March 2018
Available online

Keywords:
Intussusception
Appendicitis
Appendiceal intussusception
Pediatric radiology

ABSTRACT

Intussusception and acute appendicitis are part of a differential diagnosis for acute abdominal pain and vomiting in the pediatric population. We describe a unique case combining appendiceal intussusception with concurrent acute appendicitis, or “appendio-sception.” A 1-year-old boy presented with 1 day of fussiness, vomiting, and red, gelatinous stool. Initial diagnosis on ultrasound was a routine ileocolic intussusception with nonvisualization of the appendix. However, after a failed air enema decompression, the patient was taken to the operating room where the appendix was discovered to be inflamed within the intussusceptum. This case is unique as few cases of both conditions occurring simultaneously have been previously described. It is important for radiologists to be aware of this combination of diagnoses as both require urgent evaluation and prompt treatment.

© 2018 the Authors. Published by Elsevier Inc. under copyright license from the University of Washington. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Introduction

Young children presenting to the emergency department with concerning gastrointestinal symptoms require prompt, thorough evaluation to assess for acute abdominal pathologies such as intussusception and acute appendicitis. The clinical presentation can be similar in both diagnoses with symptoms including abdominal pain, vomiting, diarrhea, and fussiness. Demographic features may aid in narrowing the differential diagnosis as intussusception is more common in younger children. Both acute appendicitis and intussusception carry high morbidity and mortality rates if not promptly treated, and require early diagnosis and unique treatment. We describe a rare case that combines both conditions.

Case report

A previously healthy 1-year-old boy presented from daycare to an outside institution with a 1-day history of fussiness, vomiting, and red, gelatinous stools. An ultrasound was performed that showed findings of an ileocolic intussusception and nonvisualization of the appendix. Given these findings, the patient was immediately transferred to our facility for a decompressive air enema radiograph. On second review of the outside ultrasound result at our institution, multiple lymph nodes and fat within the intussusceptum were discovered (Fig. 1A and 1B). The air enema scout radiograph demonstrated mild gaseous distention of an upper abdominal bowel loop with a paucity of bowel gas in both lower quadrants (Fig. 2).
Unfortunately, only partial decompression was achieved and general surgery was promptly consulted (Fig. 3). The patient was alert but fussy on physical examination. His abdomen was distended with a sausage-like, tender mass on palpation of the right lower quadrant. Vital signs remained within normal limits. No laboratory values were obtained and the patient was then taken to the operating room for laparoscopic manual decompression of the intussusception. As the intussusception was surgically reduced, the appendix was discovered to be inflamed within the intussusceptum, warranting an appendectomy and diagnosis of acute appendicitis (Fig. 4). Acute appendicitis was confirmed by pathology. The patient received 3 doses of piperacillin-tazobactam postoperatively, convalesced, and was discharged home.

Discussion

Intussusception is a major cause of intestinal obstruction in young children between the ages of 3 months and 3 years; generally with up to 75% of cases being idiopathic in etiology [1]. Ileocolic intussusception is the most common variant of intussusception accounting for at least 90% of all cases with enterenteric and colocolonic representing the remaining cases [2]. Most commonly, patients present symptoms of intussusception between 3 months and 5 years of age, with 80%-90% of the cases occurring in patients younger than 2 years [2]. A lead point is rarely diagnosed in children younger than 4 years (2%-12%) and therefore is not generally a focus of investigation when intussusception is suspected in this age group [3].
When intussusception does occur, it is most commonly due to Meckel’s diverticulum [4]. Additionally, appendicitis is very uncommon in a 1-year-old child with only 5% of all appendicitis cases occurring in patients younger than 5 years of age [2]. Appendiceal intussusception is particularly rare with an incidence of 0.01% according to a pathologic review of 71,000 human appendix specimens [5]. In medical literature, this condition has rarely been described in only a handful of case reports, one of which was from 1957 [6,7].

When these entities present concurrently, as in our case, it brings up a “chicken or the egg” type question of whether the inflamed appendix was the lead point of the intussusception or whether the intussusception caused strangulation and inflammation of the appendix. As previously mentioned, this appendiceal intussusception was initially diagnosed as a simple ileocolic intussusception with nonvisualization of the appendix. In retrospect, the mildly inflamed appendix can be seen within the ileocolic intussusception (Fig. 1A-1B).

Beyond the rarity of this diagnosis, this was a challenging case for a variety of reasons. No labs were obtained to evaluate for leukocytosis which might have prompted further discussion of the differential diagnosis. The patient also did not have a fever to point toward infection. Furthermore, when a patient presents from an outside institution with imaging completed and a presumptive diagnosis made, it can be easier to proceed with treatment rather than review the imaging as unknown. A final confounder in this case was the nonvisualization of the appendix on ultrasound. Nonvisualization is common (13%-56%) and has a 99% negative predictive value for appendicitis when combined with a normal white blood cell count [8].

This is a strikingly rare case, given the individual rarity of appendiceal intussusception and acute appendicitis in a 1-year-old child. However, the teaching points for this case are broadly applicable. Treat outside referrals with fresh eyes and a healthy level of skepticism when the patient arrives at your door. On initial patient presentation, and especially in cases of failed intussusception pneumatic reduction, consider the possibility of a lead point or appendiceal involvement.

REFERENCES

[1] Ntoulia A, Tharakan SJ, Reid JR, Mahboubi S. Failed intussusception reduction in children: correlation between radiologic, surgical, and pathologic findings. Am J Roentgenol 2016;207(2):424–33. doi:10.2214/ajr.15.15659.
[2] Mandeville K, Chien M, Willyerd F, Mandell G, Hostetler M, Bulloch B. Intussusception: clinical presentations and imaging characteristics. Pediatr Emerg Care 2012;28(9):842–4.
[3] Kee H, Park J, Yi D, Lim I. A case of intussusception with acute appendicitis. Pediatr Gastroenterol Hepatol Nutr 2015;18(2):134.
[4] Navarro D. Intussusception. Part 3: diagnosis and management of those with an identifiable or predisposing cause and those that reduce spontaneously. Pediatr Radiol 2004;34(4):305.
[5] Collins DC. 71,000 human appendix specimens. A final report, summarizing forty years’ study. Am J Protocol 1963;(14):265–81.
[6] Kee HM, Park JY, Yi DY, Lim IS. A case of intussusception with acute appendicitis. Pediatr Gastroenterol Hepatol Nutr 2015;18(2):134–7. PMC. Web. 21 Nov. 2017.
[7] Bevan G. Intussusception and acute appendicitis. Br Med J 1957;20:931–2.
[8] Nikolaidis P, Hwang C, Miller F, Papanicolau N. The nonvisualized appendix: incidence of acute appendicitis when secondary inflammatory changes are absent. Am J Roentgenol 2004;183(4):889–92.