Septicemia after Barium Reduction in a Pediatric Patient with Intussusception

Hung Chang a, Hong-Hsiang Hu a, Ming-Fang Cheng a,b, Chi-Hsiang Kao c, Ying-Tso Shen a, Sheng-Kai Sheu a, I-Fei Huang a,b,d,*

a Department of Pediatrics, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan
b National Yang-Ming University, Taipei, Taiwan
c Department of Emergency, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan
d Chung Hwa University of Medical Technology, Tainan, Taiwan

Received Apr 7, 2015; received in revised form Aug 4, 2015; accepted Sep 4, 2015
Available online

1. Introduction

Air, water, or contrast enema reduction is the modality of choice for managing intussusception. Fever, bowel perforation, and hypovolemic shock are potential postreduction complications.1–3 Septicemia postreduction for intussusception has not been reported.

2. Brief Report

A 4-year-old boy was admitted to our hospital because of sudden-onset abdominal pain that lasted 5 hours. He had no prior history or signs of fever, vomiting, diarrhea, or currant-jelly stools. A physical examination revealed no rebounding tenderness or palpable abdominal mass. A standing plain film of the abdomen revealed no signs of intraperitoneal free air or intestinal obstruction. Intussusception was highly suspected because of the target sign over the right upper quadrant of the abdomen on ultrasonography. A subsequent barium enema demonstrated a spring-coil appearance over the ascending colon, which was successfully reduced by the passage of barium through the small intestine (Figure 1).

Twenty-four hours after the barium reduction, a fever >38.5°C persisted with abdominal pain. A standing plain film of the abdomen revealed a small amount of barium retention and no signs of intraperitoneal free air. Antibiotics were not prescribed because he had a normal white blood cell count (7.6 × 10⁹/L) and only a mildly elevated C-reactive protein level (2.6 mg/dL). Two days later, the spiking high fever, leukocytosis (12.7 × 10⁹/L), thrombocytopenia (32 × 10⁹/L), and elevated C-reactive protein (13.61 mg/dL) persisted. On physical examination, the patient was unwell and lethargic, but he had no peritoneal signs. Abdominal ultrasonography only showed several lymph nodes and a small amount of ascites. The antibiotics ampicillin (120 mg/kg/d every 6 hours) and cefotaxime (150 mg/kg/d every 6 hours) were prescribed. On the first day of fever, a blood culture showed Klebsiella planticola and Pantoea agglomerans, which were susceptible to the prescribed antibiotics. However, the fever persisted. Two days later, a second blood culture revealed Klebsiella pneumoniae, which was also susceptible to the prescribed antibiotics. The antibiotics were then shifted to meropenem (60 mg/kg/d every 8 hours) and amikacin (15 mg/kg/d). An immunological study, cardiac echography, and whole-body inflammation scan (i.e., gallium scintigraphy) were performed because of persistent bacteremia. The

* Corresponding author. Department of Pediatrics, Kaohsiung Veterans General Hospital, 386, Ta-Chung First Road, Kaohsiung, Taiwan.
E-mail address: huang.ifei1968@gmail.com (I.-F. Huang).

http://dx.doi.org/10.1016/j.pedneo.2015.09.014
1875-9572/Copyright © 2016, Taiwan Pediatric Association. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Please cite this article in press as: Chang H, et al., Septicemia after Barium Reduction in a Pediatric Patient with Intussusception, Pediatrics and Neonatology (2016), http://dx.doi.org/10.1016/j.pedneo.2015.09.014
findings were all negative. The fever completely subsided 18 days after the initiation of antibiotic treatment. Follow-up blood cultures showed no growth. Twenty-four days after admission, the patient was discharged in stable condition.

3. Discussion

Reports describing bacteremia after barium reduction for intussusception are scarce. Only one study encompassing 61 patients treated with barium reduction for intestinal intussusception exists in the literature. In this study, 26 patients (n = 61) developed a fever ≥38°C, and patients with a transient fever had a mean hospital stay of 2.9 days. Transient bacteremia or endotoxinemia due to bacterial translocation through the intestinal wall, similar to the process that has been described in other forms of intestinal obstruction, was postulated in these patients with a temporary rise in body temperature after barium reduction. Deitch cultured mesenteric lymph nodes obtained at laparotomy from 42 patients who were not clinically infected. Ten (59%) of 17 patients with intestinal obstruction (none of whom had necrotic bowel) had bacteria in their MLNs, in contrast to one (4%) of 25 patients operated on for other reasons. However, the hypothesis was not confirmed by a positive blood culture result. The present report supports the transient bacteremia hypothesis.

Somekh et al collected blood cultures prospectively from 27 patients with intussusception to determine the association between intussusception and bacteremia. Three sets of blood cultures were drawn from each patient before, immediately during, and 2 hours after air reduction. Six blood cultures (n = 81) were positive for bacterial pathogens. Only one blood sample was drawn 2 hours after air reduction, but the culture revealed *Staphylococcus aureus*. No patient had more than one positive blood culture result. Somekh et al concluded that the incidence of bacteremia from enteric pathogens after air enema reduction was extremely low. However, Miller et al reported a 3-month-old girl whose clinical condition deteriorated because of severe sepsis after successful reduction of an intussusception by air enema. During the laparotomy, the periappendiceal area showed inflammation, which may have caused the appendicocolic intussusception. This finding suggests that an underlying septic process may aggravate sepsis, and lead to clinical deterioration after the enema. However, this case differs from ours in that abdominal ultrasonography showed no remarkable findings and gallium scintigraphy revealed no underlying septic process.

To the best of our knowledge, this is the first case of bacteremia that persisted 24 hours after the procedure, and was caused by the enteric organisms *K. planticola*, *P. agglomerans*, and *K. pneumoniae*. Bowel perforation, immune deficiency, or other sources of infection were not evident. Barium reduction is a well-established therapy for intussusception; however, persistent bacteremia with sepsis is a risk. Early recognition of persistent bacterial translocation after barium reduction and antibiotic therapy are important for managing this condition.

Conflicts of interest

The authors have no financial or nonfinancial conflicts of interest to declare related to the subject matter or materials discussed in the manuscript.

References