Commentary on “Current diagnosis and image-guided reduction for intussusception in children”

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Pediatricians or emergency physicians should suspect first in young children with cyclic irritability, vomiting, or bloody diarrhea. If abdominal tenderness or palpable mass is present on the child’s abdominal examination, it is more likely to be intussusception. Abdominal ultrasonography (USG) is the primary diagnostic tool for the diagnosis of intussusception. Although point-of-care USG by trained pediatric emergency physicians had high sensitivity (100%) and specificity (95.6%), abdominal USG is usually performed by a radiologist rather than a pediatrician or emergency physician because most pediatric intussusception is managed in training hospitals in Korea. The advantage of performing USG by radiologists is that other findings can determine the failure of enema reduction, including the blood supply status of the intussusception, presence of intestinal necrosis or ascites, and the pathologic leading causes can also be confirmed.

Image-guided enema reduction is the initial treatment modality for intussusception and is performed by a radiologist. The successful and safe enema reduction of intussusception depends primarily on the experience and preference of the radiologists and the availability of resources. In Korea, the second-grade residents (42%) in the radiology department most commonly performed the enema reduction in training hospitals. In one university hospital, among 657
cases, 596 children were successfully treated, and 12 patients (1.83%) had colon perforation from 1990 to 2001. The success rate of enema reduction was high and the severe complication of enema reduction was slightly high to the meta-analysis report (0.39~0.43%). For safe and successful enema reduction of intussusception, the training of the radiology department residents is essential.

The pediatrician receives a consent form for enema reduction from the parents after diagnosis of intussusception. Enema reduction should be performed with parental understanding and consent of the procedure and complications of enema reduction. It is imperative to explain how to perform enema reduction, its complications, and the possibility of failure. In addition, when enema reduction fails, or complications develop, it is necessary to explain and obtain consent for emergency surgery. Therefore, enema reduction can be performed in hospitals where surgery is possible. In cases of failure of enema reduction, intestinal perforation, and multiple recurrences, only a surgeon can treat it, so it is necessary to prepare for surgery by communicating it in advance.

In Korea, the success rate of enema reduction for intussusception is about 82.0% to 90.0%. The recurrence of the intussusception rate was 15.0% (4,580/30,444 cases). Most recurrent intussusception is also managed by enema reduction. But multiple recurrent cases are managed by surgery.

Pediatricians always consider the complications of enema reduction before and after the procedure. The most severe complication is the bowel’s perforation, requiring urgent surgery. In
the review of 12 colonic perforations during pneumatic enema reduction,\(^7\) the perforation site was most commonly found at the proximal part of intussusception and had a single perforation. Pathologic reports showed hemorrhagic necrosis and mesenteric laceration at the site of colon perforation. Colonic perforation during pneumatic air enema had 58.3% of tension pneumoperitoneum, requiring immediate decompression.\(^7\) Therefore, the pediatrician should form the surgeon that enema reduction will be performed.

Intussusception is not a disease that a pediatrician can treat alone. The pediatrician must do all things to suspect the possibility of intussusception, contact the radiologist for abdominal USG, explain and consent to the parents for enema reduction, and informs the surgeon about the possibility of surgery while going for enema reduction (Table 1). In conclusion, pediatricians, radiologists, and surgeons should cooperate closely.

**Conflicts of interest:** none

**References**

1. JO S, Lim IS, Chae SA, Yun SW, Lee NM, Kim SY, et al. Characteristics of intussusception among children in Korea: a nationwide epidemiological study. BMC Pediatrics 2019;19:211.
2. Hryhorczuk AL, Strouse PJ. Validation of US as a first-line diagnostic test for assessment of pediatric ileocolic intussusception. Pediatr Radiol 2009;39:1075-9.
3. Lee JY, Kim JH, Choi SJ, Lee JS, Ryu JM. Point-of-care ultrasound may be useful for detecting pediatric intussusception at an early stage. BMC Pediatrics 2020;20:155
4. Yoon JH, Kim HJ, Koo HW. Recent trends of radiological reduction of intussusception in
children: A nationwide phone survey to training hospitals in Korea. J Korean Radiol Soc 2000;43:765-9.

5. Ntoulia A, Tharakan SJ, Reid JR, Mahboubi S. Failed Intussusception Reduction in Children: Correlation Between Radiologic, Surgical, and Pathologic Findings. American J Roentgenol 2016;207:424-33.

6. Stein-Wexler R, O'Connor R, Daldrup-Link H, Wootton-Gorges SL. Current methods, for reducing intussusception: survey results. Pediatr Radiol 2015;45:667-74.

7. Kim YK, Im HR, Lee GH, Han SJ, Sun YH, Roo E, et al. Colon perforation during air enema reduction of intussusception. J Korean Pediatr Soc 2003;46:37-41.

8. Sadigh G, Zou KH, Razavi SA, Khan R, Applegate KE. Meta-analysis of Air Versus Liquid Enema for Intussusception Reduction in Children. AJR Am J Roentgenol 2015;205:W542-9.

9. Lee EH, Yang HR. Nationwide population-based epidemiologic study on childhood intussusception in South Korea: emphasis on treatment and outcomes. Pediatr Gastroenterol Hepatol Nutr 2020;23:329-45.

10. Kim PH, Hwang J, Yoon HM, Lee JY, Jung AY, Lee JS, et al. Predictors of failed enema reduction in children with intussusception: a systematic review and meta-analysis. Eur Radiol 2021;31:8081-97.
Table 1. Role of doctors who treated children with intussusception.

| Role       | Actions                                                                 |
|------------|-------------------------------------------------------------------------|
| Pediatrician | History taking, Physical examination, Initial diagnostic order, Consent for the enema reduction, Preparation of enema reduction |
| Radiologist | Reading simple abdomen, Abdominal ultrasonography, Image-guided enema reduction |
| Surgeon     | Ready for surgical management, Surgery (<ul>- Manual reduction, - Hemicolecetomy, etc.</ul>) |