Improving diagnostic confidence in pediatric intussusception

A multifaceted approach in a regional radiology practice

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Purpose and background

Purpose

• Standardization of initial management of suspected intussusception
• Increase diagnostic confidence of sonographers and radiologists in pediatric exams, including intussusception

Background

• Ileocolic intussusception is a common pediatric abdominal emergency typically diagnosed by ultrasound
• In our community practice, the exam is performed by a non-specialized sonographer and may be interpreted by a pediatric or non-pediatric radiologist, depending on availability
Methods

• Pre-intervention survey including both radiologists and sonographers regarding exposure, knowledge, and confidence in imaging pediatric patients, including intussusception

• Case-based CME presentation for sonographers and radiologists through didactic slides and videos summarizing imaging techniques, common findings, and the new reporting templates and management algorithm
INTUSSUSCEPTION ALGORITHM

Outside Facility? No

Local Patient? Yes

Request Repeat US at Local Medical Center

Intussusception Ultrasound

Negative Ileoceleal Intussusception, Other pathology suspected

Pre Reduction Checklist
1. View abdomen XR, Supine + Left lateral decubitus
2. Working IV, may also suggest pre-procedural hydration
3. Surgeon notified by ordering physician

Recommended CT Abdomen and Pelvis with IV Contrast

Best Practice at Local Facility
1. Perform in fluoroscopy in room 3
2. Initial Scout image
3. Wide field of view
4. Continuous fluoroscopic monitoring
5. Proper image documentation of intussusception, reduction, reflux into TI

Positive Ileocecal Intussusception

ED Request for enema for Intussusception Reduction

Rad to ensure Pre-Reduction checklist is competed

Perform Enema (Air or Liquid)

Reduced Completely? Yes STOP

No Notify Surgeon

Surgeon may request repeat enema with sedation (nurse) and/or liquid contrast

Reduction Successful? Yes STOP

No Notify Surgeon

Negative Ileocecal Intussusception, Positive SB Intussusception

Repeat US of region after 15 mins to determine if transient or persistent

Resolved? Yes

Persistent

Rad discretion to further evaluate by repeat US or other imaging

Negative Ileocecal Intussusception with NO other pathology found

STOP

Legend

Rad ED Physician Surgeon Process End
Sonographer checklist

- In-house design for streamlined communication between sonographers and radiologists
Radiologist template

- In-house design for streamlined communication between sonographers and radiologists
Sonographer education

- Detailed instructions for the entire imaging process, from techniques to image collection and pathologic features
Radiologist education

- Narration of ileocolic and small bowel-small bowel intussusception with key findings
Results

- Test scores improved following entire set of education materials (cranial, pylorus, intussusception, appendix)
- Radiologists reported significantly increased confidence in interpretation and felt training was adequate
- There was a lack of significant improvement in sonographers; this may be due to infrequent exposure to live cases and overall pediatric training
- Narrative feedback described an improved understanding of small-bowel-small bowel and ileocolic intussusception and common pitfalls
Conclusion

• Internal CME with didactic and video-based instruction is an effective method for practice improvement
• Practice-wide confidence in diagnosis and management of ileocolic intussusception has increased
• Sonographers formed a pediatric study group in response to the survey results and are seeking additional hands-on opportunities in pediatric imaging
• Future
  • Quantitative comparisons of cases before and after education
  • New education interventions for other pathologies