Is Gad really Rad? Investigating the necessity of intravasens galodinolium to diagnosis acute appendicitis

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BACKGROUND

- MRI to evaluate for acute appendicitis after ultrasound (US) is an attractive alternative to computed tomography (CT) given lack of ionizing radiation
- IV gadolinium is useful for inflammation and abscess formation, but adds additional scan time
- Reducing/eliminating unnecessary contrast administration follows ALARA pediatric radiology best practices
- Although some institutions have shifted to non-contrast (NC) MRI for the evaluation of appendicitis after US, need and preference for administering contrast has not been examined at our institution

METHODS

- 6 pediatric radiologists blindly reviewed MRI appendicitis examinations performed with contrast between 2016 and 2021
- Readers were divided into 2 groups:
  - Readers reviewed only NC sequences
  - Readers reviewed all sequences
- Readers rated each exam along a 3-point Likert scale for:
  - Appendix visualization
  - Normal/abnormal equivocal appendix
  - Periappendical inflammation
  - Positive/negative equivocal for appendix
- Readers chose best sequence to visualize appendix: DWI, T2W, T2W Fat Sat, NC T1, or postcontrast T1
- Exclusion criteria: Perforated appendicitis with abscess and post appendicectomy studies

RESULTS

- 51 studies (6 surgically positive/45 negative)
- Average patient age was 12 yrs (range: 4-17 yrs, SD: 3.8); 69% female
- Diagnosis of appendicitis in 12% based on surgically proven cases of acute appendicitis: 5/51 (12%), Group 1 (NC): 5/51 (10%), Group 2 (All): 3/51 (13%)
- T2W was the considered the best sequence (22/51, 50%), then T2W FatSat (11/51, 25%)
- Appendix was clearly visualized overall: 29/51 (66%), Group 1: 35/51 (67%), Group 2: 14/51 (65%)
- Periappendical inflammation seen overall: 5/51 (11%), Group 1: 5/51 (9%), Group 2: 3/51 (13%)
- Sub-analyses of gender and age differences was performed
  - Most cases of acute appendicitis occurred in patients >8 years of age (5/6 surgically positives >8 years)
  - No correlation between patient age or gender and confidence in which diagnosis of acute appendicitis was made in either group

CONCLUSIONS

- Results support elimination of routine gadolinium administration for MRI appendicitis studies, even in children younger than 8 years
- T2W sequences are a robust alternative to contrast
- Multianplanar T2 sequences are recommended in NC MRI appendicitis examinations

FUTURE WORK

- Further evaluation with a larger sample size
- Evaluate the confidence of diagnosing acute appendicitis on each sequence
- Survey the confidence of each interpreting radiologist prior to and after reading a large batch of studies
- Goal to elucidate whether perceived desire for contrast is based on unfamiliarity with NC MRI appendicitis studies or other reasons

REFERENCES


