

Extended experience in the preoperative assessment of pregnant patients with suspected acute appendicitis: impact of MR imaging on the negative laparotomy and perforation rates.

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Purpose: To retrospectively evaluate the impact of magnetic resonance imaging (MRI) on the appendicitis/appendectomy rate (AAR), negative laparotomy rate (NLR), and perforation rate (PR) in pregnant women with suspected acute appendicitis.

Material and Methods: Between March 1999 and October 2006, 158 pregnant women with suspected acute appendicitis were evaluated with cross-sectional imaging. One hundred and 22 patients underwent MRI (group A) following ultrasound (US) in 117 and computed tomography (CT) in 2 patients. Thirty-six patients (group B) were evaluated with US followed by CT in 3 patients. Initial interpretations of imaging studies guided patient care and were correlated with surgery and pathology findings, and/or clinical follow up. The AAR, NLR and PR were calculated.

Results: Group A (MRI): Twelve patients had acute appendicitis. US was positive for appendicitis in 3 and MRI in all 12. The MRI sensitivity and negative predictive value for diagnosing appendicitis was 100%. The normal appendix was visualized in 89% (90/110) with MRI and in 0% (0/105) with US. "Confirmatory" CT in 2 patients with true positive MRI yielded 1 false positive and 1 false negative. MR was inconclusive in 6 patients: appendix not seen (n=2), borderline enlarged (n=3), and markedly enlarged without peri-appendiceal inflammation (n=1). For 2 false positive MRI's, 1 underwent surgery. Three additional patients underwent negative laparotomies (1 borderline enlarged appendix, 1 with a complex right ovarian cyst, and 1 negative MRI). For positive surgeries without appendicitis (n=6), MRI correctly identified the alternative diagnosis in all 6 while US was positive in 3/5. The AAR, NLR, and PR were 73% (11/15), 3.2% (4/122), and 17% (2/12), respectively.

Group B (No MRI): Seven patients had acute appendicitis. US was positive for appendicitis in 2. There were 3 true negative CT studies. The AAR, NLR, and PR were 54% (7/13), 16% (6/37), and 14% (1/7), respectively

Discussion: Appendiceal perforation is much more common in pregnant women than in the general population, with reported rates up to 55% (1,2). The frequency of appendicitis among pregnant patients who undergo appendectomy varies from 48% to 80% due to lack of specificity of signs and symptoms (3). MR imaging is a robust method for assessing pregnant patients with clinical suspicion of appendicitis and can dramatically reduce the negative laparotomy rate without adverse impact on disease severity. The need for CT in this ionizing radiation sensitive cohort can be dramatically reduced.

Conclusion: MRI facilitates the diagnosis of appendicitis in pregnancy with a substantial increase in the AAR and decrease in the NLR, with no substantial increase in the PR. Alternative diagnoses can be accurately established.

References:

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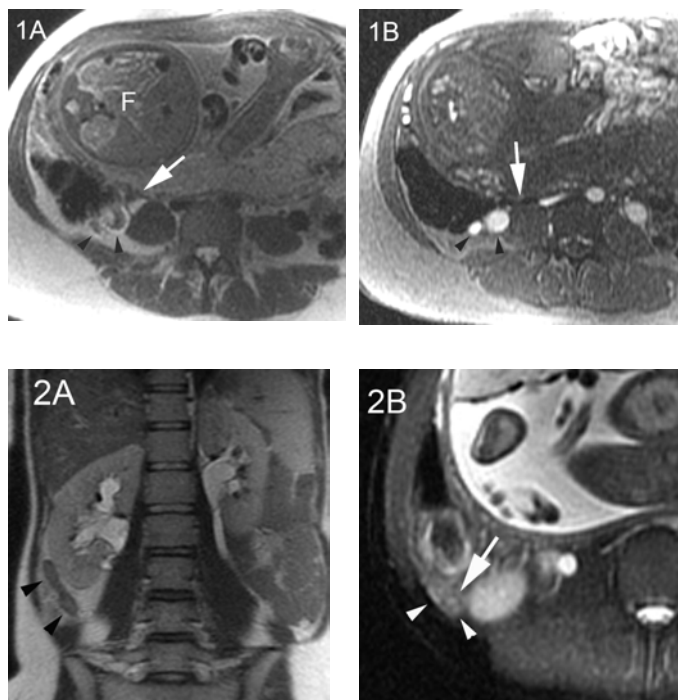


Figure 1. Axial SSFSE (1A) in pregnant patient with right lower quadrant (RLQ) pain shows two round structures of heterogeneous signal intensity (SI) (arrowheads) and a tubular structure of low SI (arrow). Fetus (F). Axial T2*-W TOF image (1B) confirms the presence of flow in gonadal vein varices (arrowheads). The normal appendix (arrow) shows blooming effect due to air and/or contrast in its lumen.

Figure 2. Coronal SSFSE (2A) image in pregnant patient with RLQ pain shows an enlarged blind-ending tubular structure (arrowheads) adjacent to the right kidney. Axial fat-saturated SSFSE (2B) confirms the presence of periappendiceal edema as a rim of high SI (arrowheads) around the fluid-filled distended appendix (arrow). At surgery and pathology confirmed the diagnosis of uncomplicated acute appendicitis.