
RSNA Press Release

Imaging Helps Diagnose Women with Suspected Acute Appendicitis

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OAK BROOK, Ill. - Imaging should be considered part of the routine evaluation of women with suspected acute appendicitis, according to a study published in the October issue of the journal *Radiology*. Researchers at Stanford University Medical Center (SUMC) say that CT (computed tomography) and ultrasound improve diagnostic accuracy, reduce unnecessary surgeries and facilitate early treatment.

"The symptoms of appendicitis are notoriously inconsistent and vague," says the study's senior author R. Brooke Jeffrey, Jr., M.D., professor of radiology and Chief of Abdominal Imaging at SUMC. "About a third of all patients exhibit atypical symptoms, or symptoms that mimic other conditions."

The resulting accuracy rate when diagnosing appendicitis is 80 percent - which means 20 percent of patients undergoing an appendectomy have a normal appendix removed. Diagnosing women is even more challenging, because the symptoms of appendicitis are similar to those of acute gynecological and urinary tract abnormalities. The diagnostic accuracy rate for women with suspected appendicitis is between 60 percent and 68 percent.

Appendicitis -- the inflammation of the appendix, a small, finger-shaped pouch at the tip of the colon on the lower right side of the abdomen -- affects 7 percent of the U.S. population each year. If untreated, an inflamed appendix can burst, causing infection and even death. The standard treatment for appendicitis is surgical removal of the appendix.

While the use of CT and ultrasound has helped improve diagnostic accuracy, the Stanford researchers performed a retrospective analysis to determine which patients would benefit the most from preoperative imaging.

The study included a review of the medical records of 1,130 consecutive patients who were preoperatively evaluated and underwent an appendectomy at Stanford University Medical Center between September 1997 and August 2000. Of the patients, 462 were diagnosed with suspected acute appendicitis. After dividing the patients into four groups based on gender and age (men, women, boys and girls), the researchers analyzed the effect of preoperative imaging on the removal of a normal appendix. Preoperative imaging studies were obtained

in 313, or 68 percent of the 462 patients. The results showed that, of the four groups considered, women with suspected appendicitis had better outcomes with preoperative imaging. Based on the data, women had the highest rate of normal appendix removal (28 percent) when no preoperative imaging study was performed. That rate decreased to 7 percent when CT was obtained and to 8 percent when ultrasound was performed as part of the pre-operative evaluation.

"Clinicians have observed for years that women with suspected appendicitis, especially those of reproductive age, benefit from imaging technology to help determine if the appendix is inflamed," says Dr. Jeffrey. "Our study brings statistical validity to that assessment."

The study did not identify a statistically significant benefit to preoperative imaging for the other three patient groups. As a result, researchers suggest that for these groups, only patients with confusing clinical signs and symptoms undergo preoperative imaging.

"In addition to lowering the rate at which normal appendixes are removed and reducing the cost and risk of unnecessary surgery," Dr. Jeffrey points out, "imaging studies have the potential to expedite the diagnosis of appendicitis, eliminate in-hospital observation days and establish alternative diagnoses facilitating early treatments."

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Radiology is a monthly scientific journal devoted to clinical radiology and allied sciences. The journal is edited by Anthony V. Proto, MD, School of Medicine, Virginia Commonwealth University, Richmond, Virginia. *Radiology* is owned and published by the Radiological Society of North America, Inc. (<http://radiology.rsna.org>.)

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"Imaging for Suspected Appendicitis: Negative Appendectomy and Perforation Rates." Collaborating with Dr. Jeffrey on this paper were Sandra E. Bendeck, M.D., and Gerald J. Berry, M.D.