Rush to Judgment Often Behind Missed Appendicitis

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INCLINE VILLAGE, NEV. — Cognitive errors often contribute to failure to properly diagnose appendicitis, John Rose, M.D., said at an annual emergency medicine meeting sponsored by the University of California, Davis.

Diagnostic algorithms tend not to be very helpful for appendicitis because the clinical signs and tests are so variable. By keeping in mind common cognitive errors, unusual presentations, and the predictive value of tests, a physician may recognize an atypical case of appendicitis that would otherwise be missed, he said.

Cognitive errors—in which the physician's train of thought is dictated by an initial impression or a positive finding—include the framing effect, the freezing effect, and the availability error, said Dr. Rose of the department of emergency medicine at the university.

The framing effect involves getting an initial impression and letting it guide subsequent thought processes rather than keeping an open mind—something that detectives are trained not to do. "Half the time when you do this, you are right, and then you get a little overconfident because you are right, and then you get burned," he said.

The freezing effect occurs when a physician latches onto a positive finding and loses sight of the bigger picture. This occurred in the case of a 29-year-old woman who came in with right lower quadrant pain and a temperature. She had a normal pelvic exam, but an ultrasound showed an ovarian cyst. She was sent home with a diagnosis of an ovarian cyst, and later came back with a ruptured appendix. Just because a diagnostic test is positive doesn't mean it has pinpointed the cause of the patient's complaint, he cautioned.

The availability error means judging a case too quickly based on how readily a diagnosis comes to mind. Dr. Rose offered the example of a 55-year-old woman who came in with gastric pain and vomiting. Her belly exam was normal, and family members had just had stomach flu. She was diagnosed with viral gastroenteritis, despite not having any diarrhea. Hers turned out to be an atypical presentation of a myocardial infarction.

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Another reason physicians may misdiagnose appendicitis is failure to appreciate unusual presentations. The classic findings of right lower quadrant pain, abdominal rigidity, and migration of pain from the periumbilical region to the right lower quadrant occur in only about 50% of patients with appendicitis. Lower left quadrant pain is present in 7% of cases, suprapubic pain in 10%, and diarrhea in 9%. Anorexia is seen in less than half of patients, according to some series. About 25% of patients have no fever. Overall in appendicitis, the diagnostic accuracy of physicians by history and physical exam is 80%.

"Remember to think: 'Maybe that suprapubic pain isn't a UTI. Maybe it's an appendix,'" Dr. Rose advised. "Remember to think outside the box."

Another factor that contributes to missed diagnosis of appendicitis is relying too much on tests with little predictive value, notably the WBC count.

The "likelihood ratio," which represents a combination of sensitivity and specificity, is thought to be a more intuitive way of expressing a test's predictive value. It indicates the likelihood that a given result would be expected in a patient with the disorder, compared with the likelihood the result would be expected in a patient without the disorder. Likelihood ratios of 1 or 2 mean a test is not very good.

In appendicitis, the white cell count has a likelihood ratio of 1-2 because only 80% of appendicitis patients have an elevated white cell count—as do 70% of patients with other reasons for their abdominal pain, Dr. Rose said.

Plain x-ray and ultrasound studies also have low likelihood ratios, but CT has a high ratio. Focused helical CT with contrast has a positive likelihood ratio of 49, but even without contrast, it has a high ratio of 29, he said. ■

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