Letters to the Editor

Diagnosing acute appendicitis: is there any role of ultrasonography?

To the Editor:

We read with interest the article titled “Examining the Relevance of the Physician’s Clinical Assessment and the Reliance on Computed Tomography in Diagnosing Acute Appendicitis” by Nelson et al1 in the April 2013 issue of the American Journal of Surgery. The study highlights the importance of clinical decision making as well as the role of computed tomography (CT) in the diagnosis and management of acute appendicitis (AA). We have the following comments.

The study reflects the liberal use of CT for the diagnosis of AA. The authors mention that the negative appendectomy rate on the basis of clinical assessment consistent with appendicitis was 4%, compared with 3% associated with CT. It is also mentioned that 82% of the cohort underwent CT regardless of the initial clinical impression. The authors mention that in a random sample of 100 cases, in 87%, the initial emergency department plan was based on computed tomographic findings. All these facts and figures indicate that findings on CT may have possibly influenced clinical decision making. Achieving a negative appendectomy rate of 4% with clinical assessment alone without any corresponding increase in the perforation or complication rate is a great accomplishment, which we think is virtually impossible. The exact negative appendectomy rate and perforation rate associated with clinical diagnosis can only be evaluated when the decision to operate is based solely on the clinical assessment and in a group of patients who preferably do not undergo any imaging test or at least the treating surgeon is blinded to the results of the imaging. The present study does not mention any of these factors.

The study population consisted of young adults with a mean age of 31 ± 16 years. Hence the data do not represent a true cross-section of the general population, including children. It may be noted here that clinical diagnosis of uncomplicated AA in young male patients is often straightforward. Women of reproductive age formed a sizable group of patients (37%) in this study. It is well known that a considerable diagnostic dilemma occurs in this age group because of frequent overlap with gynecologic conditions. It is very surprising that ultrasonography (USG) is not even mentioned in the entire study, including among women.

Despite our improved understanding of the pathophysiology of AA, technological advances, and decades of experience in the management of AA, the best clinicians even today are likely to face the dilemma of balancing between negative appendectomy rate and perforation or complication rate. The present report does not mention perforation or complications, despite involving a relatively large number of patients (n = 664), which itself is a rarity. The authors describe the sensitivity and specificity of CT in diagnosing AA as 100% and 50%, respectively. The reason for such low specificity of CT is not clear.

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The pathophysiology of AA need not be seen as an “all or none” phenomenon. AA has a spectrum of pathologic events ranging from catarrhal to transmural inflammation and complications such as perforation if not resolved or treated. Although Alvarado scoring is a time-tested clinical scoring system, it has its own pros and cons. For example, if a patient with AA reports to a clinician in the initial phase of the disease process, the overall score will be low, but this cannot rule out the possibility of AA with certainty. Similarly, depending on the position of the appendix (e.g., retrocecal appendix), the physical findings of right iliac fossa tenderness and rebound pain may be difficult to elicit. It is also well known that inflammatory pathology of the right iliac fossa, including a number of gynecologic conditions, can mimic AA to a great extent. Laboratory features such as leukocytosis and neutrophilia are, again, nonspecific. Alvarado score neither takes into account of the temporal profile of the disease nor considers anatomic variations of the position of appendix. Thus, in the day-to-day management of right iliac fossa pain, Alvarado score must be correlated with the overall clinical profile of the patient before making any definitive decision.
In clinical practice, a patient usually reports pain in the abdomen localized to the right iliac fossa. As clinicians, we are duty bound not only for the timely and accurate diagnosis of AA but also to suggest the possibility of alternative etiologies which can explain patients’ symptoms and signs reasonably well. It is well established in the literature that imaging has a definite role to play in the diagnosis of AA, excluding the possibility of AA in addition to diagnosing or suggesting alternative pathologies, which is equally important. Ironically, most studies (including the present one) deliberate mainly on the ability to detect the presence or absence of AA when validating clinical, radiologic, and/or laboratory parameters, ignoring the very important aspect of alternative diagnoses.

Even in a high-probability case of AA, there is a definite role of imaging. Imaging can not only reaffirm the clinical suspicion but also alert the physician to any possible complications, such as abscess formation, free fluid, early lump formation, and so on, which may necessitate appropriate modification in the therapeutic approach. Besides, imaging can also depict the exact site and orientation of the inflamed appendix, which at times can be helpful to the treating surgeon. For example, prior knowledge of a long, ascending retrocecal appendix (which is not so uncommon) would certainly help the treating surgeon plan the surgery appropriately rather than getting a surprise on the operating table.

Another issue, which is of concern to all of us in medicine and to humanity at large, is the liberal or rather indiscriminate use of CT for the diagnosis of AA. CT has already become the first-line investigation of choice (as also mentioned by the authors) in many institutions and countries. The proponents of routine use of CT often cite accuracy, shorter hospital stays, and overall economic considerations as the reasons to justify the use of CT, with a total disregard for its potential hazards. It is time for all of us to ponder as to whether we really need CT in every case for the diagnosis of AA. We suggest the answer should be “certainly not.” It is well documented in the literature that dedicated appendiceal sonography by an experienced radiologist or sonologist is comparable with CT. Having the cumulative experience of doing >50,000 abdominal sonographic studies, we are of the opinion that by doing dedicated appendiceal USG, CT can be safely avoided in a large number of patients. Given that it is versatile, easily available, and reasonably accurate and that it lacks any known hazards, USG should be used as the first modality of choice in all cases of suspected AA. We suggest the answer should be “certainly not.” It is well documented in the literature that dedicated appendiceal sonography by an experienced radiologist or sonologist is comparable with CT. Having the cumulative experience of doing >50,000 abdominal sonographic studies, we are of the opinion that by doing dedicated appendiceal USG, CT can be safely avoided in a large number of patients. Given that it is versatile, easily available, and reasonably accurate and that it lacks any known hazards, USG should be used as the first modality of choice in all cases of suspected AA. CT may be reserved as a problem-solving tool when USG is technically suboptimal or findings are indeterminate against the background of clinical suspicion for AA. USG is known to be very helpful in children not only in the diagnosis of AA but also for the diagnosis of mesenteric adenitis, which can clinically simulate AA. In women of reproductive age, transabdominal USG followed by transvaginal USG, wherever indicated, often yields the requisite and valuable information adequate for management.

It is true that the results of USG are highly dependent on the sonologist’s skill. However, it is also true that CT is not completely operator independent. The success of CT for AA depends a lot on the technique used (eg, slice thickness, multiplanar reconstruction, adequate bowel opacification, use of intravenous contrast media) and patient-related factors such as the availability of sufficient perilappendiceal fat as well as anatomic disposition of the appendix. The present study by Nelson et al, although centered on the relevance of clinical examination and accuracy of CT, does not even mention what CT protocols were used in examining the patients. It is important to realize that CT has its own list of technical and interpretive pitfalls.

Needless to say, as with USG, the correct interpretation of appendiceal computed tomographic scans also necessitates observer experience. However, as an imaging modality, CT has a definite advantage over USG in certain situations, such as in obese patients and retrocecal appendicitis, for which USG is technically difficult.

Another aspect, which is often ignored, is the importance of periodic observation in cases of suspected AA when clinical and/or imaging findings are equivocal. In an admitted patient who is under active observation, the fear of missing a diagnosis of AA with its consequences is really unfounded.

Finally, we appeal to the medical fraternity, particularly radiologists, to take another look at the full potential, versatility, and utility of USG; use USG as the first-line modality; reserve CT and magnetic resonance imaging as problem-solving tools; understand the pros and cons of CT; and put a stop to the liberal use of CT for suspected AA for the greatest benefit of humanity.

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References