

Commentary

The diagnosis of acute appendicitis has traditionally been based on clinical examination. As the quality of and reliance on clinical acumen declines imaging has increasingly taken over to the point that even barn door obvious cases are subjected to computerised tomography (CT). In this context it is important to realize that a “negative” laparotomy is somewhat different from a negative CT for appendicitis. A negative laparotomy is likely to be a onetime event in as much as that acute appendicitis will never be considered as a possible diagnosis once the offending organ has been removed even if it was apparently normal. A negative CT exposes the patient to a radiation dose that is likely to be repeated anytime he has the recurrence of symptoms. As most patients with this condition are young people, it is particularly important to minimise the radiation dose of CT for appendicitis. Seong Jong Yun et al undertake a meta-analysis of the published data that compares the performance standard dose and low dose CT in the management of suspected acute appendicitis. Their analysis demonstrates that both low and standard dose CT perform equally in patients with suspected acute appendicitis. This strongly supports the universal adoption of low dose protocols for CT for appendicitis. Unfortunately a significant number of scanners installed in Pakistan are older, refurbished models that may not have the latest dose reduction protocols and algorithms built into them.

Staying with reviews Carrol et al review the evidence related to another gastrointestinal disorder of the paediatric population, intussusception. There continues to be a debate regarding fluoroscopy versus ultrasound and hydrostatic versus pneumatic. Carrol et al find that evidence supports ultrasound for diagnosis and pneumatic enema for reduction.

Professionalism (or more accurately the lack of) is increasingly the focus of patient’s concerns regarding their physician’s performance or interaction. Complaints about the lack of professionalism are becoming more frequent especially in relation to trainees. Globally there is an increased awareness and emphasis on what Kelly et al call “non-interpretative core competencies” in radiological training. Professionalism is difficult to teach and even more difficult to assess. However it is necessary in order to maintain the public’s confidence in the physician body. Professionalism is part of every competency based assessment including ACGME in the United States of America, the GMC in the United Kingdom as well as the CPSP in Pakistan. Kelly et al set out some practical guidance on how to approach the teaching and assessment of this difficult competency from a radiology perspective.

Lian et al remind us that FDG-PET is not the answer to all oncological imaging questions (even if some radiologists and oncologists still think so). They compared the accuracy of Magnetic Resonance Imaging with FDG PET CT for the N staging of early breast cancer. They (re) demonstrate that MRI is superior to PET CT in this regard. PET CT is a valuable, but expensive resource. Its use needs to be justified and its clinical and economic benefits evaluated especially when majority of healthcare spending is “out of pocket” expense for the patient.

With the prevalence of chronic hepatitis at the levels that exist in Pakistan significant numbers of patients progress to cirrhosis. Although there are various methods to non-invasively evaluate fibrosis ShearWave elastography is becoming the standard of care. To further add to the evidence base to support this, Zhuang et al present their validation data and show that Shear Wave elastography is superior to all serum fibrosis models.

Prof. Zafar Sajjad

Professor of Radiology

Aga Khan University Hospital, Karachi, Pakistan.

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Seong Jong Yun, Chang-Woo Ryu, Na Young Choi, Hyun Cheol Kim, Ji Young Oh and Dal Mo Yang

Comparison of Low- and Standard-Dose CT for the Diagnosis of Acute Appendicitis: A Meta-Analysis

OBJECTIVE: A meta-analysis was performed to compare low-dose CT and standard-dose CT in the diagnosis of acute appendicitis with an emphasis on diagnostic value.

MATERIALS AND METHODS: A systematic literature search for articles published through June 2016 was performed to identify studies that compared low-dose CT with standard-dose CT for the evaluation of patients suspected of having acute appendicitis. Summary estimates of sensitivity and specificity with 95% CIs were calculated using a bivariate random-effects model. Meta-regression was used to perform statistical comparisons of low-dose CT and standard-dose CT.

RESULTS: Of 154 studies, nine studies investigating a total of 2957 patients were included in this meta-analysis. The pooled sensitivity and specificity of low

-dose CT were 96.25% (95% CI, 91.88–98.31%) and 93.22% (95% CI, 88.75–96.00%), respectively. The pooled sensitivity and specificity of standard-dose CT were 96.40% (95% CI, 93.55–98.02%) and 92.17% (95% CI, 88.24–94.86%), respectively. In a joint model estimation of meta-regression, low and standard-dose CT did not show a statistically significant difference ($p = 0.71$). Both low and standard-dose CT seem to be characterized by high positive and negative predictive values across a broad spectrum of pretest probabilities for acute appendicitis.

CONCLUSION: Low-dose CT is highly effective for the diagnosis of suspected appendicitis and can be considered a valid alternative first-line imaging test that reduces the potential risk of exposure to ionizing radiation.

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Anne G. Carroll, Richard G. Kavanagh, Caoilfhionn Ni Leidhin, Noelle M. Cullinan, Lisa P. Lavelle, Dermot E. Malone

The Comparative Effectiveness of Imaging Modalities for the Diagnosis and Treatment of Intussusception

RATIONALE AND OBJECTIVES: The purpose of this study was to critically appraise and compare the diagnostic performance of imaging modalities that are used for the diagnosis of intussusception and methods used in the treatment of ileocolic intussusception.

METHODS: A focused clinical question was constructed and the literature was searched using the patient, intervention, comparison, outcome (PICO) method comparing radiography, ultrasound, and computed tomography in the detection of intussusception.

The same methods were used to compare pneumatic (gas) reduction and hydrostatic (liquid) reduction using saline, water-soluble contrast, and barium. Retrieved articles were appraised and assigned a level of evidence based on the Oxford University Centre for Evidence-Based Medicine hierarchy of validity for diagnostic studies.

RESULTS: The retrieved sensitivity for the diagnosis of intussusception using plain radiography is 48% (95% confidence interval [CI], 44% - 52%), with a

specificity of 21% (95% CI, 18% - 24%). The retrieved sensitivity for the diagnosis of intussusception using ultrasound is 97.9% (95% CI, 95% - 100%), with a specificity of 97.8% (95% CI, 97% - 99%). Based on a good quality meta-analysis, the combined success rate of gas enema reduction was shown to be 82.7% (95% CI, 79.9% - 85.6%) compared to a combined success rate of 69.6% (95% CI, 65.0% - 74.1%) for liquid enema reduction.

CONCLUSIONS: The best available evidence recommends ultrasound as the diagnostic modality of choice for the diagnosis of ileocolic intussusception in children. In stable children without signs of peritonism, nonoperative reduction is the treatment of choice. Pneumatic (gas) reduction enema has been shown to be superior to hydrostatic (liquid) enema reduction.

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Aine Marie Kelly, Larry D. Gruppen, Patricia B. Mullan

Teaching and Assessing Professionalism in Radiology Resident Education

Radiologists in teaching hospitals and in practices with residents rotating through are involved in the education of their residents. The Accreditation Council for Graduate Medical Education requires evidence that trainees are taught and demonstrate competency not only in medical knowledge and in patient care - the historic focus of radiology education - but also in the so-called non-interpretative core competencies, which include professionalism and interpersonal skills. In addition to accreditation agencies, the prominent assessment practices represented by the American Board of Radiology core and certifying examinations for trainees, as well as Maintenance of Certification for practitioners, are planning to feature more non-

interpretative competency assessment, including professionalism to a greater extent. Because professionalism was incorporated as a required competency in medical education as a whole, more clarity about the justification and expected content for teaching about competence in professionalism, as well as greater understanding and evidence about appropriate and effective teaching and assessment methods, have emerged. This article summarizes justifications and expectations for teaching and assessing professionalism in radiology residents and best practices on how to teach and evaluate professionalism that can be used by busy radiology faculty in their everyday practice supervising radiology residents.

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X. Liang, J. Yu, B. Wen, J. Xie, Q. Cai and Q. Yang

MRI and FDG-PET/CT based assessment of axillary lymph node metastasis in early breast cancer: A meta-analysis

AIM: To evaluate the accuracy of magnetic resonance imaging (MRI) and combined 2-[¹⁸F]-fluoro-2-deoxy-d -glucose (FDG) positron-emission tomography/computed tomography (PET/CT) for N staging of breast cancer.

MATERIALS AND METHODS: A search for relevant diagnostic studies published between January 2008 and October 2015 was conducted in the MEDLINE and EMBASE databases. The quality of the studies was assessed using Quality Assessment of Diagnostic

Accuracy Studies (QUADAS) criteria. Sensitivity and specificity were analysed using the random-effect model and fixed effect model for MRI and PET/CT, respectively.

RESULTS: A total of 21 eligible studies were evaluated for the efficacy of MRI or PET/CT for diagnosing axillary lymph node status in breast cancer patients. The pooled specificities of MRI and PET/CT were similar at 0.93 (95% confidence interval [CI]: 0.92–0.94) and 0.93 (95% CI: 0.90 - 0.95), respectively; however, the pooled sensitivity of MRI was (0.82; 95% CI: 0.78 - 0.85) significantly greater than PET/CT (0.64; 95% CI: 0.59 - 0.69)]. Further analysis revealed that MRI had

a significantly higher diagnostic odds ratio (DOR) value of 51.28 (95% CI: 22.44–117.17) compared to PET/CT at 18.84 (95% CI: 11.71–31.76).

CONCLUSION: The present meta-analysis suggests that MRI not only has the higher sensitivity for lymph node metastasis diagnosis compared to PET/CT, but also has high potential for being used as a non-invasive imaging diagnostic technique. Furthermore, the ultra-small super paramagnetic iron oxide (USPIO)-enhanced MRI showed high diagnostic accuracy for identifying axillary lymph node metastases in early-stage breast cancer patients.

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Yuan Zhuang, Hong Ding, Yue Zhang, Huichuan Sun, Chen Xu, and Wenping Wang

Two-dimensional Shear-Wave Elastography Performance in the Noninvasive Evaluation of Liver Fibrosis in Patients with Chronic Hepatitis B: Comparison with Serum Fibrosis Indexes

PURPOSE: To investigate the value of two-dimensional (2D) shear-wave elastography (SWE) in the assessment of hepatic fibrosis in patients with chronic hepatitis B (CHB) and to compare the diagnostic performance of this modality with that of liver fibrosis indexes.

MATERIALS AND METHODS: The ethics committee approved this study, and informed consent was obtained. From July 2015 to May 2016, 539 subjects who underwent partial hepatectomy were divided into groups according to the Scheuer system by using a resected liver specimen. All patients were examined with 2D SWE and underwent preoperative serologic testing to measure liver stiffness and values of serum fibrosis models, which were compared with histologic findings. Performance of noninvasive methods was determined for index (304 patients) and validation (155 patients) cohorts by using areas under the receiver operating characteristic curve (AUCs).

RESULTS: For association with substantial fibrosis ($\geq S2$), severe fibrosis ($\geq S3$), and cirrhosis (S4) in the index cohort, the optimal cutoff values of liver stiffness were 7.6, 9.2, and 10.4 kPa, respectively, and AUC

values were 0.97, 0.96, and 0.98, respectively. The 2D SWE findings, aspartate transaminase-to-platelet ratio index (APRI), fibrosis index based on the four factors (FIB-4), King's score, and Forns index significantly correlated with hepatic fibrosis stages ($p = 0.88$, $p = 0.41$, $p = 0.40$, $p = 0.43$ and $p = 0.45$, respectively; $P < .05$). The AUCs for APRI, FIB-4, King's score, and Forns index were 0.77, 0.73, 0.79, and 0.77, respectively, in the diagnosis of substantial fibrosis and 0.70, 0.71, 0.72, and 0.74, respectively, in the diagnosis of cirrhosis. In the validation cohort, AUCs of noninvasive methods used to assess different fibrosis stages did not significantly differ from those for the index cohort. AUCs of 2D SWE in the diagnosis of substantial fibrosis, severe fibrosis, and cirrhosis were 0.97, 0.97, and 0.98, respectively, which were significantly higher than those in serum models ($P < .05$).

CONCLUSION: The 2D SWE protocol could be used to predict substantial fibrosis, severe fibrosis, and cirrhosis in patients with CHB with notably higher diagnostic accuracy than that attained with serum fibrosis models.