PJR July - September 2010; 20(3): 148-150

Commentary

The RECIST criteria are the objective basis of determining response of solid organ tumours to interventions. Although these criteria are widely used in clinical trials their application to daily radiology practice has been limited as they were cumbersome to use. In its current iteration there has been significant simplification of the criteria and this has made them more user friendly. Their application in general radiology practice may still be limited however in large oncology centres these and similar schema play a central role.

With the realization of the toxic potential of Gadolinium based agents there has been an increasing shift to non contrast applications especiallt in examinations that previously used a large contrast load. The typical example in MR angiography. In the early days double dose protocols were not uncommon and patients were routinely injected with doses in excess of the recommended 0.1mmol/kg of gadolinium. After NSF this is no longer acceptable and the vendors are increasingly coming up with alternatives. Krishnam et al demonsterate that usability of these techniques in routine clinical use.

On the subject of noninvasive vascular imaging, MDCT allows bone subtraction algorithms to be used in routine scanning. Their utility has however been questioned as they require a plain scan which increases the radiation dose to the patient. The article by Buerke et al increases the confusion as it demonstrates that there is little advantage and possibly significant disadvantage in taking this route to imaging the vasculature.

Normally case reports do not feature in literature reviews. However the report by Mortimer et al seriously questions a widely applied basis of differentiating cystic tumours of the brain from abscesses. Diffusion weighted imaging demonstrates restriction within abscess bot not in tumours. The report sounds a cautionary note on this and suggests that radiologists have to be careful about using DWI as the only differentiating criteria.

Zafar Sajjad
Associate Professor Radiology
Aga Khan University Hospital, Karachi.

European Radiology January 2010, 20(6):1456-67

Els L. van Persijn van Meerten, Hans Gelderblom and Johan L. Bloem

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RECIST revised: implications for the radiologist. A review article on the modified RECIST guideline

ABSTRACT : The purpose of this review article is to familiarize radiologists with the recently revised Response Evaluation Criteria in Solid Tumours (RECIST), used in many anticancer drug trials to assess response and progression rate. The most important modifications are: a reduction in the maximum number of target lesions from ten to five, with a maximum of two per organ, with a longest diameter of at least 10 mm; in lymph nodes (LNs) the short axis rather than the long axis should be measured, with normal LN measuring <10 mm, non-target LN ≥ 10 mm but <15 mm and target LN ≥ 15 mm; osteolytic lesions with a soft tissue component and cystic tumours may serve as target lesions; an additional requirement for progressive disease (PD) of target lesions is not only a ≥ 20% increase in the sum of the longest diameter (SLD) from the nadir but also a ≥ 5 mm absolute increase in the SLD (the other response categories of target lesion are unchanged); PD of non-target lesions can only be applied if the increase in

non-target lesions is representative of change in overall tumour burden; detailed imaging guidelines. Alternative response criteria in patients with hepatocellular carcinoma and gastrointestinal stromal tumours are discussed.

European Radiology January 2010, 20(6):1311-20

Mayil S. Krishnam, Anderanik Tomasian, Sachin Malik, Vibhas Desphande, Gerhard Laub and Stefan G. Ruehm

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Image quality and diagnostic accuracy of unenhanced SSFP MR angiography compared with conventional contrast-enhanced MR angiography for the assessment of thoracic aortic diseases

OBJECTIVES: The purpose of this study was to determine the image quality and diagnostic accuracy of three-dimensional (3D) unenhanced steady state free precession (SSFP) magnetic resonance angiography (MRA) for the evaluation of thoracic aortic diseases.

METHODS: Fifty consecutive patients with known or suspected thoracic aortic disease underwent free-breathing ECG-gated unenhanced SSFP MRA with non-selective radiofrequency excitation and contrast-enhanced (CE) MRA of the thorax at 1.5T. Two readers independently evaluated the two datasets for image quality in the aortic root, ascending aorta, aortic arch, descending aorta, and origins of supra-aortic arteries, and for abnormal findings. Signal-to-noise ratio (SNR) and contrast-to-noise ratio (CNR) were determined for both datasets. Sensitivity, specificity, and diagnostic accuracy of unenhanced SSFP MRA for the diagnosis of aortic abnormalities were determined.

RESULTS: Abnormal aortic findings, including aneurysm (n=47), coarctation (n=14), dissection (n=12), aortic graft (n=6), intramural hematoma (n=11), mural thrombus in the aortic arch (n=1), and penetrating aortic ulcer (n=9), were confidently detected on both datasets. Sensitivity, specificity, and diagnostic accuracy of SSFP MRA for the detection of aortic disease were 100% with CE-MRA serving as a reference standard. Image quality of the aortic root was significantly higher on SSFP MRA ($P<0.001$) with no significant difference for other aortic segments ($P>0.05$). SNR and CNR values were higher for all segments on SSFP MRA ($P<0.01$).

CONCLUSION: Our results suggest that free-breathing navigator-gated 3D SSFP MRA with non-selective radiofrequency excitation is a promising technique that provides high image quality and diagnostic accuracy for the assessment of thoracic aortic disease without the need for intravenous contrast material.

Clinical Radiology January 2010, 65:440-6

B. Buerke,[1] M. Puesken,[1] G. Wittkamp,[1] C. Stehling,[1] H. Ditt,[2] P. Seidensticker,[3] J. Wessling,[1] W. Heindel,[1] S.P. Kloska[1]

[1] Department of Clinical Radiology, University of Muenster, Muenster, Germany
[2] Siemens AG, Healthcare Sector, Forchheim, Germany
[3] Bayer–Schering–Pharma AG, Global Medical Affairs Diagnostic Imaging, Berlin, Germany

Bone subtraction CTA for transcranial arteries: intra-individual comparison with standard CTA without bone subtraction and TOF-MRA

AIM: To evaluate the impact of bone subtraction computed tomography angiography (BSCTA) for the assessment of transcranial arteries in comparison with standard CTA (S-CTA) without bone removal and time-

of-flight magnetic resonance angiography (TOF-MRA).
MATERIALS AND METHODS: Cranial unenhanced CT and S-CTA were performed in 53 patients with suspected cerebrovascular disease. BS-CTA datasets were reconstructed from the S-CTA and unenhanced CT source images. TOF-MRA was performed within 24 h after CTA on a 1.5 T MRI system. Two radiologists, in consensus, evaluated the segments of the internal carotid artery (C2–C7), the vertebral artery (V4), and the basilar artery for the degree of stenosis. A five-step scale (0–49, 50–69, 70–89, 90–99% and occlusion) for the degree of stenosis was applied for all segments. Wilcoxon's signed rank test was used for statistical analysis.
RESULTS: Seven hundred and fifty vessel segments (ICA:636, VA:106, BA:53) were analysed. The degree of stenosis on S-CTA was consistent with TOF-MRA in all segments. BS-CTA showed a trend towards higher stenosis scores in cases of calcified plaques compared to S-CTA (p ¼0.11) and TOF-MRA (p ¼ 0.09), which was not statistically significant. In transcranial segments, BS-CTA revealed equivalent scores compared to S-CTA and TOF-MRA (p ¼0.25; p ¼0.20).
CONCLUSION: BS-CTA produced similar results to TOF-MRA and S-CTA and can be applied as a non-invasive imaging method for the transcranial arteries. However, BS-CTA shows a trend towards overestimation of the degree of stenosis.

Clinical Radiology January 2010, 65:

A. Mortimer,[1,2] S. O'Leary,[2] M. Bradley,[2] S.A. Renowden[2]

[1] Severn School of Radiology, Bristol, UK
[2] Department of Neuroradiology, Frenchay Hospital, Bristol, UK

Pitfalls in the discrimination of cerebral abscess from tumour using diffusion-weighted MRI

CASE REPORT: