

Authors: John Koerner, Christopher Kepler, Anand Segar

QUESTION 2: Is there a role for computed tomography (CT) scan with contrast in the diagnosis of spinal infections in patients who cannot undergo magnetic resonance imaging (MRI)?

RECOMMENDATION: Although evidence is limited for the routine use of CT scan with contrast, there is a role for it to be used in the presence of spine infection where MRI is contraindicated or when other advanced imaging is not available

LEVEL OF EVIDENCE: Consensus

DELEGATE VOTE: Agree: 100%, Disagree: 0%, Abstain: 0% (Unanimous, Strongest Consensus)

RATIONALE

Although there is growing evidence of the safety of MRI in the presence of implanted metallic devices [1], obtaining such a study may not always be possible. CT with either extradural or intravenous contrast can be used to identify spine infections.

Prior to the wide adoption of MRI, CT myelography was commonly used to diagnose extradural compressive pathology such as epidural abscesses [2]. The use of this invasive investigation in the setting of postoperative spine epidural abscess has not been studied. However, it can be assumed that the accuracy will be lower due to metal artefact [3].

The role of CT with intravenous contrast in the postoperative setting is unclear and has not been directly studied. CT is most useful in identifying implant and bony related complications such as

implant loosening, endplate erosion and destruction. The addition of contrast provides information on paraspinal soft tissue involvement, phlegmon or abscesses albeit with lower sensitivity and specificity when compared to MRI [4].

REFERENCES

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- [2] Tyrrell PN, Cassar-Pullicino VN, McCall IW. Spinal infection. *Eur Radiol.* 1999;9:1066-1077. doi:10.1007/s003300050793.
- [3] Chaudhary SB, Vives MJ, Basra SK, Reiter MF. Postoperative spinal wound infections and postprocedural diskitis. *J Spinal Cord Med.* 2007;30:441-451.
- [4] Sundaram VK, Doshi M. Infections of the spine: a review of clinical and imaging findings. *Appl Radiol.* 2016;45(8):10-20.



Author: Glenn S. Russo

QUESTION 3: Is there a role for nuclear imaging (e.g., positron emission tomography scan (PET)) in the diagnosis of spinal infections?

RECOMMENDATION: PET scan, preferably PET-computed tomography (PET-CT), can be used as an adjunct to magnetic resonance imaging (MRI) to diagnose spinal infections when an MRI cannot be performed or is inconclusive.

LEVEL OF EVIDENCE: Moderate

DELEGATE VOTE: Agree: 100%, Disagree: 0%, Abstain: 0% (Unanimous, Strongest Consensus)

RATIONALE

At the present time, MRI is the imaging test of choice for diagnosing spondylodiscitis (SD). This study should be performed when SD is suspected to avoid the morbidity and mortality associated with a delay in diagnosis. MRI is a favored choice as part of an infectious work up due to its lack of ionizing radiation, multi-planar capability, superior soft tissue contrast and ability to evaluate the neural structures. It has a sensitivity and specificity of 97% and 93% respectively. Ultimately, its accuracy in diagnosing SD is 94% [1-3]. A typical protocol should include T1- and T2-weighted sequences with gadolinium. T2 and post-gadolinium T1-weighted sequences should also be performed with fat suppression to increase the sensitivity of identifying pathology [4,5]. Furthermore, MRI allows for the evalu-

ation of bone marrow edema and disc space inflammation, as well as paraspinal and epidural soft tissue involvement. Gadolinium is helpful in differentiating phlegmonous changes versus abscess formation.

Fluorine-18-fluorodeoxyglucose (18F-FDG) is the radionuclide-imaging test that can be a useful compliment to MRI. The role of 18F-FDG in the diagnosis of SD has been extensively investigated [6-13]. It has shown acceptable levels of sensitivity and specificity and is useful when MRI cannot be performed or is inconclusive. In addition to its value for diagnosing spondylodiscitis, 18F-FDG can be utilized to monitor response to treatment. Gallium-67-SPECT/CT is an acceptable alternative when 18F-FDG is not available [14].