

Syllabus

Specialty Area: MRI of Musculoskeletal Impingement Syndromes

Title of Session: Nerve Impingement Around the Body, Monday, 22 April 2013

Speaker Name: Luis S. Beltran, MD (luis.beltran@nyumc.org)

Highlights

- Nerve impingement syndromes can occur anywhere in the body but are more common at certain anatomic sites where the nerve passes through a fibro-osseous canal near joints or under an abnormal fibrous band, muscle or a space-occupying lesion (i.e., ganglion cyst, hematoma, osteophyte, lipoma, tenosynovitis, etc.).
- The reference standard of diagnosis is clinical history and electrodiagnostic (ED) studies, however, there are limitations to ED studies. Imaging (MRI and/or ultrasound) can help solidify the clinical diagnosis and rule out secondary causes.
- MR neurography (MRN):
 - T2-based:
 - Higher signal-to-noise ratio (SNR) and contrast-to-noise ratio (CNR) with 3 T compared to 1.5 T MR imaging improves anatomic and lesion conspicuity.
 - Novel 3D sequences allow multiplanar isotropic reformats (MPR), curved planar reformats (CPR), and maximum intensity projections (MIP) to map and display the longitudinal extent of nerve involvement.
 - Diffusion based (DWI):
 - Developed to increase nerve conspicuity by vascular signal suppression, thereby creating nerve-specific images
 - Offers potential for quantification of the nerve signal intensity (SI), apparent diffusion coefficient (ADC), fractional anisotropy (FA) values, and fiber tracking.
- Ultrasound:
 - Thickening of the nerve and nerve fascicles
 - Loss of the normal honeycomb echotexture of the nerve
 - Increase in perineural and intraneural blood flow on Doppler may occur in chronic compressive neuropathies
 - Associated mechanical compression of the nerve by surrounding space occupying lesions
 - Can be utilized to perform targeted therapies

Target audience: Radiologists, sonographers, neurologists, general clinicians

Conclusions:

- Nerve impingement can be a challenging clinical diagnosis often necessitating imaging as a confirmatory test. MRI and ultrasound are both useful in making the diagnosis and ruling out secondary space occupying lesions. Ultrasound is also useful in performing targeted therapies.

References:

1. Chhabra A, Lee PP, Bizzell C, Soldatos T. 3 Tesla MR neurography--technique, interpretation, and pitfalls. *Skeletal Radiol.* 2011Oct.;40(10):1249–60.
2. Kara M, Ozçakar L, De Muynck M, Tok F, Vanderstraeten G. Musculoskeletal ultrasound for peripheral nerve lesions. *Eur J Phys Rehabil Med.* 2012Dec.;48(4):665–74.