

# AMERICAN SOCIETY OF NEURORADIOLOGY 2007 PROCEEDINGS

JUNE 11 - 14, 2007  
HYATT REGENCY CHICAGO  
CHICAGO, ILLINOIS

CHICAGO  
ASNR 2007

Includes Interactive  
CD-ROM



## CONCLUSION

Alterations in labyrinthine fluid signal intensity induced by IAC vestibular schwannomas can be detected using this 3D FLAIR technique. Further study with audiometric correlation is warranted to determine if these signal changes have any prognostic significance.

**KEY WORDS:** 3D Flair MR imaging, temporal bone, vestibular schwannoma

## Paper 71 Starting at 3:39 PM, Ending at 3:47 PM MR Imaging of the Membranous Labyrinth at 3T

Morris, J. M.<sup>1</sup> · Lane, J. I.<sup>1</sup> · Johnson, K. J.<sup>2</sup> · Bolster, B.<sup>2</sup> · Horger, W.<sup>2</sup> · Witte, R. J.<sup>1</sup>

<sup>1</sup>Mayo Clinic, Rochester, MN, <sup>2</sup>Siemens Medical Solutions, Malvern, PA

## PURPOSE

Clinical MR imaging of the inner ear has been limited to demonstrating fluid signal intensity within the bony labyrinth on T2-weighted sequences. However, recent advances in image acquisition techniques and hardware are capable of generating resolution and contrast sufficient to differentiate tissue in these structures in scan times that are clinically feasible. We describe our efforts to directly visualize the membranous labyrinth at 3T.

## MATERIALS & METHODS

Six volunteers were imaged on a 3T MR unit (Magnetom Tim Trio, Siemens Medical Solutions, Erlangen, Germany). Either 7 cm loop coils or 4 ch flex coils were centered over the external auditory canal and used to acquire 3D T2 SPACE in the axial plane through the IAC with a 10 cm FOV, 294 x 320 matrix and 0.3 mm partitions, yielding 0.3 mm isotropic resolution. Reference was made to an ex vivo T2-weighted dataset of a cadaver temporal bone specimen scanned at 9.4T (Oxford vertical bore) for positive identification of membranous labyrinthine structures.

## RESULTS

As seen in Figure 1, we could reliably identify the utricular macula as a curvilinear area of relative T2 hypointensity along the anterior margin of the utricle within the vestibule of the inner ear. The crista ampullaris of the semicircular ducts were apparent but less conspicuous within the ampullae of the semicircular canals. We currently are unable to resolve the saccule and scala media within the cochlea using this technique.

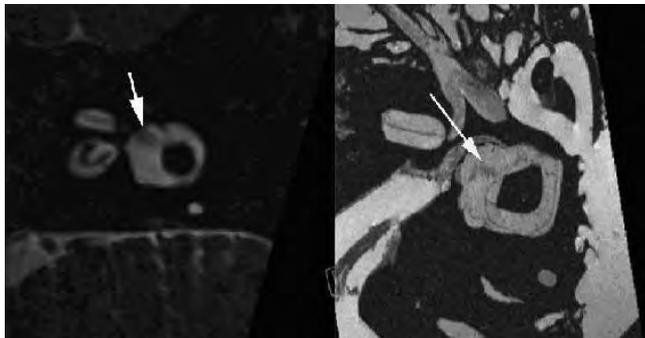


Figure 1. Left, 3T MR image using 3D SPACE technique demonstrates low signal utricular macula of the membranous

labyrinth (arrow). Right, 9.4T T2-weighted image of cadaver temporal bone demonstrates low signal macula (arrow).

## CONCLUSION

To our knowledge, this is the first report of visualization of the membranous labyrinth on MR imaging. Further study is warranted to improve spatial resolution and to evaluate the clinical utility in the assessment of cochleo-vestibular disease.

**KEY WORDS:** Membranous labyrinth, 3T MR imaging, temporal bone

## Paper 72 Starting at 3:47 PM, Ending at 3:55 PM Superior Canal Dehiscence: Multidetector-Row CT Evaluation

Palermo Patera, G.<sup>1</sup> · Iaia, A.<sup>2</sup> · Sparacia, G.<sup>1</sup> · Texeido, M.<sup>2</sup> · Midiri, M.<sup>1</sup>

<sup>1</sup>Policlinico Giaccone, Palermo, ITALY, <sup>2</sup>Cristiana Care, Newark, CA

## PURPOSE

To present a series of 26 patients, with clinical findings suggestive of superior canal dehiscence syndrome, who presented to a single otologic practice and to describe the clinical workup, common findings, surgical and conservative treatment of these patients.

## MATERIALS & METHODS

Retrospective chart review of 26 patients seen with clinical symptoms attributed to superior canal dehiscence confirmed on high-resolution CT scan of the temporal bone. Along with the CT scan, all patients underwent physical examination, audiogram and vestibular-evoked myogenic potentials.

## RESULTS

The charts of 16 females and 10 males (mean age 50) with unilateral otologic symptoms were reviewed. All patients had dehiscence of the superior semicircular canal seen on CT scan of the temporal bone on the ipsilateral side. To date five of the 26 patients have undergone transmastoid occlusion of the superior semicircular canal with significant improvement in clinical symptoms.

## CONCLUSION

All patients reviewed presented with various complaints of sound-induced nausea or vertigo, aural pressure, hyperacusis, autophony generalized disequilibrium and hearing loss. These symptoms all can be easily attributable to other common otologic conditions such as perilymph fistula, otosclerosis, hydrops or eustachian tube dysfunction. Patients with superior canal dehiscence syndrome may not present with the classic Tullio phenomenon and symptomatology. Few patients with symptomatic superior canal dehiscence elect surgical treatment. Making the correct diagnosis with the combination of clinical history, audiologic evaluation, VEMP, properly formatted CT scans and high clinical suspicion can save patients from unnecessary and potentially harmful treatments such as stapedectomy or perilymph fistula repair.

**KEY WORDS:** Sparacia