Lumbar sagittal diffusion-weighted imaging (DWI) (A) and color-coded apparent diffusion coefficient (ADC) cartography (B) reveal that the central part of the mass is hyperintense on DWI, appearing brighter than the normal spinal cord, despite a decreased ADC.

Figure 2

Coupes sagittales pondérées en diffusion (A) et cartographie du coefficient de diffusion apparent (ADC) (B), au même niveau de coupe. La partie centrale de la lésion apparait hyperintense en diffusion, de signal plus élevé que le cordon médullaire sus-jacent, avec diminution de l’ADC.

tissue planes in the spine, and the susceptibility distortions at the air—tissue interface.

An alternative approach to eliminate these artifacts is to correct for the phase error on each line of k space by recording a non-phase encoding echo [3]. This technique allows DWI to be performed with a conventional spin-echo sequence, thereby providing a high signal-to-noise ratio with fewer susceptibility artifacts. Recently, line-scan diffusion imaging was proposed as a reliable method for imaging the spinal column. It is less sensitive than EPI-based DWI to susceptibility artifacts, and less susceptible to patient motions than are other multishot techniques [4]. However, we chose not to use these alternative techniques, because motion artifacts are generally less common at the lumbar level than at the cervical or thoracic level.

In conclusion, this report confirms the usefulness of spinal DWI as a reliable tool to discriminate epidermoid from arachnoid-cysts in the postoperative spine.

References


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3D-CISS MRI in a purely intracanalicular cochlear schwannoma

IRM 3D-CISS d’un schwannome cochléaire intracanalaire pure

Schwannomas arising from the cochlear nerve and confined to the internal auditory canal (IAC) are extremely rare [1–4]. Most usually, acoustic schwannomas arise from the superior vestibular nerve. This report of a case of right intracanalicular cochlear schwannoma highlights the importance of three-dimensional constructive interference in steady state (3D-CISS) MRI in the definitive diagnosis of this rare condition and its clinical relevance.

A 46-year-old man presented with progressive hearing loss in the right ear of three years duration, with intermittent non-pulsatile tinnitus and vertigo for the past year. Clinical examination revealed a predominantly sensorineural hearing defect on the right side. His audiogram showed severe mixed hearing loss on the right and high-frequency deafness on the left. MRI of the temporal bone, carried out with a 1.5-T clinical scanner (Avanto SQ-Engine, Siemens, Erlangen, Germany), showed a well-defined, enhancing mass lesion, 2 mm in size, confined to the right IAC on thin T1-weighted, fat-saturated, contrast-enhanced axial images (Fig. 1). However, the lesion’s nerve of origin was not clear. There was no evidence of mastoid or middle-ear pathology detected on either side on MRI. Further evaluation was performed using thin axial, coronal and oblique sagittal 3D-CISS sequences (TR/TE/TA = 11.64 ms/5.81 ms/4.51 min), with a flip angle of 70 degrees and slice thickness of 1 mm. The oblique sagittal images were acquired separately for each IAC, perpendicular to its long axis. These sequences...
revealed that the lesion was confined to the cochlear nerve within the IAC on the right side (Fig. 1) and led to the diagnosis of cochlear nerve schwannoma; the patient is currently on clinical follow-up.

The vestibular nerve is more likely to have a disordered arrangement of sheath cells at the glial—schwann cell junction and hence, is more prone to develop schwannomas [5]. These tumors are more commonly seen involving the cochlea, labyrinth or middle ear than the intracanalicular cochlear nerve. We could find only five previously reported cases of such intracanalicular schwannomas originating from and confined to the cochlear nerve [1—4,6]. Preoperative MRI diagnosis of such a condition is even more rarely reported [4,6].

Management choices for tumors confined to the cochlear nerve within the IAC depend on several factors, including age and clinical status of the patient and hearing levels in the involved and uninvolved ears [4]. Shin et al. [6] recently described a case of sudden deafness, which was diagnosed by gadolinium-enhanced MRI and surgically removed using a transtotic approach. For those who have poor hearing in the other ear, as in our case, management by observation will help the patient to use the hearing in the involved ear for as long as possible. Hence, the precise imaging diagnosis is of critical importance. Cross-sectional imaging anatomy of the 7—8th nerve complex within the IAC is well described [7]. The facial nerve occupies the anterosuperior portion while the cochlear nerve lies in the anteroinferior portion, with the vestibular nerves coursing through the posterior compartments of the IAC.

3D-CISS is routinely used in the evaluation of cerebellopontine angle lesions and inner- and middle-ear structures [8]. The millimeter-thin sections and short TE (limiting signal loss due to magnetic susceptibility effects) with this technique allow good spatial resolution and a high signal-to-noise ratio within clinically feasible acquisition times. In our case, this sequence gave the maximum information concerning the spatial relationship of the small intracanalicular tumor. Acquiring images in the coronal and oblique sagittal planes perpendicular to the IAC proved to be most fruitful for demonstrating the cochlear location of the lesion compared with thin contrast-enhanced, axial, T1-weighted images. Surgery can be deferred in purely intracanalicular cochlear schwannomas until hearing loss is complete or tumor growth mandates its immediate removal [4,6]. For this reason, a precise imaging diagnosis is important to the clinical decision-making process. In our case, there was discordance between the clinical examination and audiogram findings for reasons that remain unknown. Also, no pathology was detected by MRI in the mastoids or middle ear on either side.

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