Preoperative MRI in neurovascular compression syndromes and its role for microsurgical considerations

Bajorinaite A., Dementaviciene J.
Vilnius University Hospital Santariskiu Klinikos, Lithuania

Background. Neurovascular compression (NVC) is defined by the relation of vascular structures with the nerve at the root entry zones (REZ) and other parts of cranial nerves, proceeding with trigeminal neuralgia (TN), hemifacial spasm, vertigo. When microvascular decompression is considered vascular structures should be examined in anatomical relation to the nerve root. New MR techniques have become available, and their impact evaluated in this study.

Materials and methods. In our study we examined three patients with TN and four patients with vertigo. Three patients underwent 1.5T MRI and four patients underwent 3T MRI. Three-dimensional time-of-flight (3D-TOF) and three-dimensional constructive interference in steady state (3D-CISS) sequences were used to evaluate anatomical neurovascular relationships. The MRI data were retrospectively analyzed and compared to the intraoperative findings concentrating on topography of the NVC site and the relation of vascular structures with the nerve root: compression, contact or distant.

Results. The superior cerebellar artery (SCA) was the most common causative vessel in 5 of 7 cases (71.4%), the anterior inferior cerebellar artery (AICA) in 2 of 7 cases (28.6%). In all cases (100%) neurovascular relationship was defined as positive: 4 of 7 cases (57.1%) had vessel contact with REZ and 3 of 7 (42.8%) cases represented compression. 6 patients (85.7%) with TN and one vertigo patient were symptom-free since discharge. One patient experienced trigeminal neuralgia in two months after surgery.

Conclusions. An accurate identification of the relation of vascular structures to the nerve root is possible, high resolution MR images provide detailed information on corresponding intraoperative anatomy. Preoperative evaluation may contribute to indication and planning.