

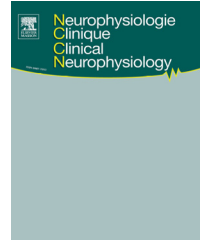


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ORIGINAL ARTICLE/ARTICLE ORIGINAL

Effects of microvascular decompression surgery on posture control: A case report in an elderly patient



Effet de la décompression neurovasculaire cochléovestibulaire sur le contrôle postural chez une patiente âgée

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KEYWORDS

Neurovascular conflict;
Microvascular decompression;
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Elderly patient

Summary

Aims of the study. – We report the case of an 84-year-old woman with neurovascular conflict of the left cochleovestibular nerve. Prior to surgery, the patient complained of positional vertigo and dizziness for the past two years, and marked instability. Hearing loss and tinnitus were reported on the left side. The aim of this study was to investigate the effects of microvascular decompression of the cochleovestibular nerve on posture control.

Materials and methods. – Evaluation of cochleovestibular function and posture control was performed before and after surgery. Postural performance was analyzed in static and dynamic conditions, with and without vision, and with optokinetic stimulation. Perception of the static visual vertical (SVV) was recorded in darkness.

Results. – Positional vertigo and tinnitus disappeared immediately after the decompression. The SVV remained unchanged one week after the surgery. Speech intelligibility of the left ear was improved (30 dB), and the vestibular deficit on this side was also significantly reduced (54% versus 18%). However, the more spectacular result was the effect on postural control.

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MOTS CLÉS

Conflit
neurovasculaire ;
Compression
microvasculaire ;
Control postural ;
Patient âgé

This elderly patient improved her postural balance in both static and dynamic conditions, and became able to maintain her equilibrium in the more challenging dynamic conditions, with and without vision, as early as one week after the surgery, a postural performance that she had been unable to do preoperatively.

Conclusion. – This work is the first to show that the postural deficits resulting from neurovascular conflict of the cochleovestibular nerve are strongly improved after microvascular decompression.

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Résumé

But de l'étude. – Dans le spasme hémifacial et la névralgie du trijumeau, l'efficacité de la décompression neurovasculaire dans l'angle ponto-cérébelleux est bien reconnue à ce jour. Nous rapportons ici le cas d'une femme de 84 ans présentant un conflit neurovasculaire du nerf cochléovestibulaire gauche. La patiente a consulté pour des crises de vertige et des instabilités posturales invalidantes, accompagnées d'une hypoacousie gauche et d'un acouphène gauche. La chirurgie de décompression neurovasculaire a été réalisée par voie rétro-sigmoïdienne assistée par endoscopie.

Matériel et méthode. – La patiente a été examinée avant et après chirurgie (7 jours et 2 mois) en conditions statique et dynamique d'équilibration (plateforme stable versus instable), avec et sans vision, et avec stimulation optocinétique. Une évaluation de la verticale visuelle subjective (VVS) et un examen de la fonction cochléovestibulaire ont été aussi réalisés avant et après chirurgie.

Résultats. – Avant décompression, l'examen posturographie mettait en évidence des instabilités posturales en conditions statique et dynamique, majorées en absence de vision et avec stimulation optocinétique, conditions conduisant à la chute de la patiente. En postopératoire immédiat (7 jours) et à plus long terme (2 mois), l'équilibre postural était possible en condition dynamique ainsi qu'en absence de vision. L'analyse des paramètres posturographiques (énergie, puissance spectrale) ne montrait plus de différences significatives par rapport aux normes de sujets de même âge. La VVS n'était pas affectée par la décompression. Les vertiges et l'acouphène gauche avaient totalement disparu. L'intelligibilité était améliorée à gauche et le déficit vestibulaire gauche était fortement réduit (54 % versus 18 %).

Conclusion. – Ce travail est le premier à montrer que les déficits posturaux, résultant d'un conflit neurovasculaire du nerf cochléovestibulaire chez une personne âgée, sont améliorés après chirurgie de décompression.

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Introduction

In hemifacial spasm [6,36,46], trigeminal neuralgia [29], and glossopharyngeal neuralgia [29,30,34,37], the efficacy of microvascular decompression during surgery in the cerebellopontine angle is well established. However, the syndrome of compression of the cochleovestibular nerve due to a neurovascular conflict is still a somewhat controversial clinical entity [44]. The main reason is that the eighth cranial nerve includes both cochlear and vestibular (superior and inferior divisions) nerve components, and its compression can lead to complex symptomatology. Indeed, vascular compression in the cerebellopontine angle of the cochleovestibular nerve may be one of the causes of intractable and incapacitating tinnitus, vertigo, and sensory deafness, causing significant morbidity and impaired quality of life [46]. Microvascular decompression (MVD) of the nerve is a safe and effective surgical procedure for treatment of severe tinnitus [12] and/or vertigo in patients [5,25,26,28]. Jannetta was the first to demonstrate that these symptoms, caused by vessels compressing the eighth nerve, may be relieved by vascular decompression [14]. More recently, Zhang et al. observed

complete resolution of tinnitus in 12 patients after MVD, partial relief in 6 patients, and no effect in 4 other cases. Regarding vertigo, complete symptomatic resolution was observed in 5 patients, partial relief in 3 patients and no effect in 2 cases. De Ridder et al. also reported hearing improvement as a secondary outcome by subtracting preoperative audiograms from postoperative audiograms obtained 2 years after MVD [10].

It is well established that vestibular input signals project to the vestibular nuclei, which in turn project to the spinal cord, the ocular motor nuclei, the cerebellum, the thalamus, the parieto-insular vestibular cortex and related cortical areas processing the vestibular input. These descending and ascending pathways are known for their functional role in posture control and equilibrium function, gaze stabilization, self-motion perception, and spatial navigation (see [21], for review). Many of the other symptoms reported in the context of suspected neurovascular conflict, such as dizziness and imbalance, severe motion intolerance and brief intense episodes of rotational vertigo, may considered as indications for microvascular compression of the eighth nerve. However to our knowledge, no previous study

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