

Anatomical correlate of an impaired fixation suppression of the vestibulo-ocular reflex in patients with cerebellar lesions

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Abstract

Objectives: The vestibulo-ocular reflex (VOR) is a reflex eye movement that stabilizes images on the retina by producing compensatory eye movements during head and body movements. When combined eye-head tracking is used to track smooth target motion, accurate gaze is maintained by adequate fixation-suppression of the VOR (vestibulo-ocular reflex suppression, VORS). Patients with cerebellar lesions have an impaired VORS, which is associated with a smooth pursuit deficit. This suggests an underlying common mechanism¹. Since clinical data on impaired VORS are rare and multiple cerebellar structures seem to be involved in the VORS, the aim of the present study was to define the key anatomical areas associated with an impaired VORS.

Methods: Twenty-five patients with acute, mainly unilateral cerebellar infarctions and an intact VORS were compared to 13 patients with cerebellar lesions and an *impaired* VORS by means of lesion-mapping imaging.

Results: The uvula was found to be the structure commonly damaged in patients with impaired VORS; it was significantly less involved in patients with intact VORS. The pyramid of the vermis and the tonsil in the cerebellum were also strongly associated with an impairment of the VORS .

Conclusion: The present data give evidence that the uvula is an important anatomical structure within the circuitry involved in the VORS. This suggests that lesions of the uvula might lead to an impaired VORS due to a deficient smooth pursuit system.

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