Controlateral pursuit deficit from unilateral pontine damage: two case reports

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The aim of this work is to describe two particular cases of saccadic and smooth pursuit movements alterations caused by a **focal unilateral pontine tegmental lesion**

Case 1

The first patient is a 27-years-old woman with a breast carcinoma that developed ataxia and weakness in leftward gaze

⇩

Brain MRI showed a solitary enhancing lesion limited to the ***left dorsal pontine tegmentum***, presumed to be metastatic

Case 2

The second patient is a 45-years-old man
that abruptly developed a left crossed pontine syndrome

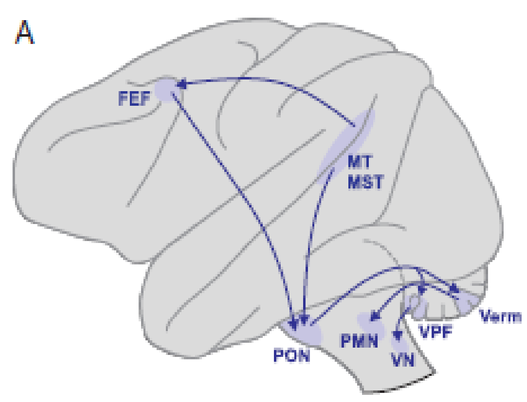
⇩

Brain MRI showed *a* ***left pontine tegmental*** hemorragic lesion

Neuro-opthalmological and Electro-oculographic study of both patients:

- **leftward** saccades were **slow** and **hypometric** in the first patient, **abolished** in the second.
- **rightward** pursuit was **interrupted** by catch-up saccades while leftward pursuit was normal.
- slow phase of horizontal **optokinetic nystagmus** (OKN) was **absent** to the **right**, while leftward OKN slow phase was normal.
- **vestibulo -ocular reflexes** (VORs) were **abolished** when stimulating a **rightward** slow phase; contralateral VORs were normal.
- **no nystagmus with fixation**

A

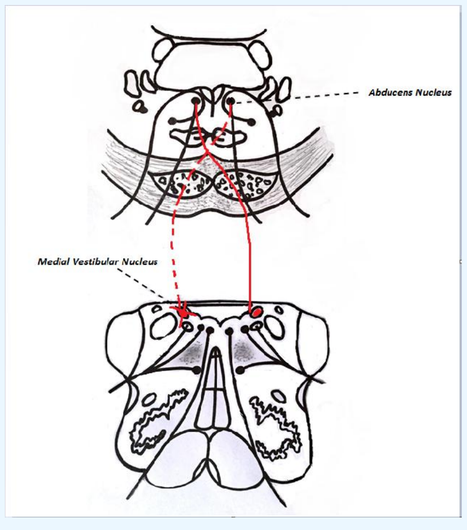


The impairment of **contralateral smooth pursuit** movements may be associated with:

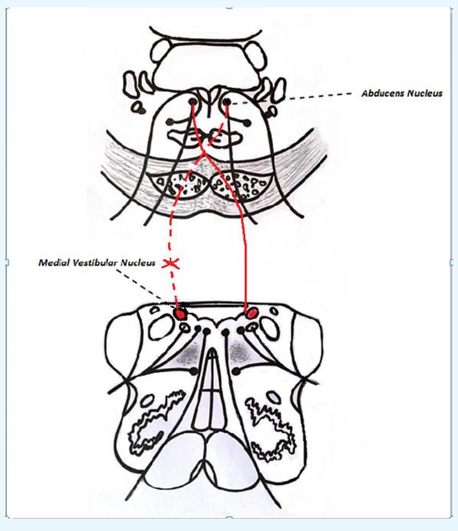
✓damage of excitatory mossy fibres from pons to cerebellum (after their decussation)
✓lesion of the excitatory fibres projecting from MVN to the contralateral abducens nucleus (prior to their decussation).

In our patient, the involvement of OKN and VORs suggests a damage of:

B



MVN neurons



projections of MVN to the contralateral abducens nucleus

Our data may seem to **contradict previous findings** (contralateral smooth pursuit impairment with **preservation of VORs**)

more extensive damage to the neurons of MVN ⇦ Possible explanations: ⇨ early adaptative repair of VORs

On the basis of this data, the possibility that unilateral pontine tegmental lesions determine both ipsilateral and contralateral movements alterations, suggests that
the oculomotor pattern depends on the neurological structures involved, rather than the lesion site simply

An asymmetry in the pursuit movements in a patient presenting a possible pontine lesion has an only limited value in the localization of the site of the lesion

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