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# Posterior Fossa Volume and Response to Suboccipital Decompression in Patients with Chiari I Malformation

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## Différents types d'architecture de la fosse postérieure observés chez les porteurs de Chiari, incidence sur les stratégies de traitement

### Clinical Study

Neurosurgery. 37(2):214-218, August 1995.

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### Abstract :

SMALLER POSTERIOR FOSSA (PF) volume has been suggested to be one of the mechanisms responsible for tonsillar herniation through the foramen magnum in patients with Chiari I malformation (CM I). Although previous radiological analyses of the cranial anatomy have suggested a smaller PF volume in patients with CM I, the relationship of the PF volume to decompressive surgery has not been reported. We have measured the ratio of PF volume to supratentorial volume (PF ratio [PFR]) in 20 patients with CM I and 20 control patients by retrospectively studying their magnetic resonance images with a computerized image analyzer. The mean PFR in patients with CM I (with or without syringomyelia) was significantly smaller than for those in the control group (15.6 +/- 1.9 versus 17.5 +/- 1.2, P = 0.0008). Although PFR did not correlate with the extent of tonsillar herniation in patients with CM I, it did directly correlate with their age, i.e., younger patients with CM I (but not control patients) had smaller PFRs. All but three patients responded both clinically and radiographically to decompressive surgery. Those patients who did not benefit from surgical intervention had normal PFRs. We conclude that : 1) PFRs are smaller in most patients with CM I ; 2) a smaller PF may be a primary cause of tonsillar herniation ; 3) patients with CM I who have smaller PFRs tend to develop symptoms earlier than those with normal values ; 4) patients with smaller PFRs tend to respond better to suboccipital decompression.

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