Occipital bending in depression

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Sir,

I read with great interest the article by Maller et al. (2014) concerning occipital bending and its association with depression. While there is a large body of sound and most interesting literature on brain asymmetry, I think that in some of these studies the brain is regarded in total isolation thereby neglecting its surrounding structures with their complicated anatomic inter-relationships and physiological interactions. Although it is true that the developing and growing brain determines the shape of its surrounding osseous structures, this interaction may not be exclusive and other anatomic and physiological factors may exert their influence on this process thereby determining the shape of the brain to some extent.

From a neuroangiographic point of view I would like to point out that skull base anatomy is asymmetric beyond direct brain association. It is well recognized that in most cases the jugular foramina are uneven in size, with the right one being significantly more capacious than the left in about two-thirds of cases (Rhoton, 2000). It is hypothesized by some that the more direct communication of the right jugular vein with the right atrium might cause unhindered back-propagation of right atrial pulse waves through the valve-less venous system, leading to an early dilatation and increase in capacity of the right-sided venous system (www.neuroangio.org). In contrast the left brachiocephalic vein is often smaller in size than its right-sided counterpart and appears to be squeezed between the structures of the superior thoracic aperture, possibly attenuating such pulse waves and even causing functional restriction of the left-sided exocranial flow in certain situations.

The amount of venous blood in the superficial venous system is known to exceed the amount of blood in the deep venous cerebral system (Di Chiro, 1962; Bub et al., 1968). In roughly two-thirds of cases the superior sagittal sinus, which receives the blood from the superficial venous system of both hemispheres, drains preferentially or exclusively to the right transverse sinus and thus the right jugular foramen. Therefore the larger foramen receives the larger amount of blood. In contrast, blood from the deep venous system drains preferentially or exclusively into the left transverse sinus in these situations. In such a constellation the confluens sinuum is splayed and at times functionally separated. In the far more frequent constellation of the right transverse sinus draining the superior sagittal sinus, this sinus is nearly always seen to deviate significantly from the midline in its posterior parietal and occipital course. As the falx is fixed to the sinus this causes displacement of the interhemisperic cleft thereby leading to occipital bending. This phenomenon is well recognized and can be of immediate clinical significance when neurosurgical access to posterior parasagittal brain areas is contemplated.

To conclude, I would like to remind the readers of and—at best—direct research at the possible interactions of the formation of brain asymmetry and interrelated anatomical and physiological systems.

References


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