Midline suboccipital approach

The midline suboccipital approach is the most commonly used approach to the posterior fossa in pediatric neurosurgery. In contrast to the retrosigmoid approach and far lateral approaches, it provides access to midline tumors in the cerebellum, particularly those arising from the fourth ventricle and the cerebellar vermis.

Position

The operation can be performed in the prone or the sitting position. In the prone position, there is a greater tendency for venous hemorrhages to occur; in the sitting position, there is a greater risk of air embolism.

Incision

The incision is made in the midline; beginning 2 to 3 cm above the external occipital protuberance, it extends as far as C3 or C4. The fascia and the musculature are divided in the midline (nucal ligament-marked with the discontinuous red line) and retracted laterally. A muscle stump is left in place al the superior nuchal line. This facilitates approximation of the musculature during wound closure. Bleeding from the bone is controlled with bone wax.

Craniotomy

One burr hole each is placed in paramedian position in the occipital squama over the cerebellar hemispheres. Occasionally, the dura over the cerebellar hemispheres is very thin and fragile; this requires careful attention during the osleoclastic craniectomy. Using the drill or forceps of all kinds (curved, angulated, straight, etc.), the bone is bilaterally removed down to the transverse sinus. In the presence of very strong occipital squamae, particularly in the confluence area, the bone can be thinned with burrs. The transverse sinus has to be exposed as far as its inferior border, as there would otherwise not be sufficient visualization or space for an operative procedure in the depth. A partial resection of the atlantal arch has to be carried out. It should be borne in mind that the vertebral arteries enter the area of the great foramen at the superior border of the lateral atlantal arch.

Dural opening

As a general rule, the dura over the midline of the posterior cranial fossa is opened by a Y- shaped incision, the two arms extending to the transverse sinus, and the vertical leg of the Y heading in the cervical direction. The dura should always be opened as far as Cl - C2 to allow easy inspection of the cerebellar tonsillae. The occipital sinus, which develops with considerable variations, requires a double ligature in all cases.

After the Y-shaped opening of the dura and retraction of the arachnoid the cerebellar hemispheres,

the vermis and tonsils are exposed, with the vessels coursing superiorly.

Indications

Midline tumors in the cerebellum

Hemispheric cerebellar tumors may also be removed through this route, with a slight modification of the approach towards the side of the lesion. The most common pediatric posterior fossa tumors specifically pilocytic astrocytomas, medulloblastomas, or ependymomas can be removed with this approach. It provides access to the pineal region and permits the removal of those brain stem tumors with an exophytic component in the fourth ventricle.

see Midline suboccipital subtonsillar approach