Keyhole retrosigmoid craniotomy

Resection of intrinsic brainstem tumors is fraught with a high risk of morbidity. In select cases, however, complete tumor resection is possible and can result in long-term benefit to the patient. Informed consent for the operation was obtained. In this video, we illustrate the use of a keyhole retrosigmoid craniotomy for microsurgical resection of an exophytic juvenile pilocytic astrocytoma and highlight the nuances of opening the various fissures between the brainstem and the cerebellum to obtain a more direct view of the brainstem, mapping of the brainstem surface to avoid cranial nerve nuclei, use of safe entry zones to minimize injury to critical structures, and microsurgical technique used to operate within the substance of the brainstem. In general, navigation is used to optimize placement of craniotomy and size of bony opening, to delineate the superior to inferior extent of the tumor, and to confirm that the boundary between the tumor and the normal brainstem is reached at the depth. In general, the authors attempt surgical resection of brainstem tumors that are exophytic, have clear boundaries (signal on T1 postcontrast and T2 sequences denote similar tumor boundaries), do not encapsulate the basilar artery, and do not exhibit infiltration of the deep pontine fibers (as is the case with diffuse intrinsic pontine gliomas). In properly selected patients, surgery for brainstem tumor can result in good resection with preservation of neurological function. This patient developed subtle weakness of the face after surgery, which did not improve at 3 mo, but had preserved hearing function and no further neurological deficits [1)].

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