Midline Pontine Splitting Approach

Surgical approaches to intrinsic pontine lesions are technically difficult and prone to complications. The surgical approach to intrinsic brainstem tumors through midline pontine splitting is regarded as safe since there are no crossing vital fibers in the midline between the abducens nucleus at the facial colliculus in the pons and the oculomotor nucleus in the midbrain, although its actual utilization has not been reported previously.

A 6-year-old boy presented with a large intrinsic cystic lesion in the pons. Chiba et al. successfully achieved gross total removal via the median sulcus of the fourth ventricle. The fixation in adduction and limitation of abduction were newly observed in the left eye after surgery.

The advantage of the surgical approach through the median sulcus is the longer line of dissection in an axial direction and the gain of a wider operative view. On the other hand, the disadvantage of this approach is the limited orientation and view toward lateral side and a possible impairment of the medial longitudinal fasciculus and paramedian pontine reticular formation, which are located lateral to the midline sulcus bilaterally and are easily affected via the median sulcus of the fourth ventricle floor. Ongoing developments in intraoperative neuro-monitoring and navigation systems are expected to enhance this promising approach, resulting in a safer and less complicated procedure in the future.

The surgical approach through midline pontine splitting is suitable for midline and deep locations of relatively large pontine lesions that necessitate a wider surgical window [1].

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Chiba K, Aihara Y, Kawamata T. Intrinsic Well-Demarcated Midline Brainstem Lesion Successfully Resected through a Midline Pontine Splitting Approach. Pediatr Neurosurg. 2020 Dec 17:1-6. doi: 10.1159/000511878. Epub ahead of print. PMID: 33333533.