Supraorbital eyebrow approach

[1)]

The supraorbital eyebrow approach utilizes an eyebrow skin incision to fashion a supraorbital craniotomy for exposure of the subfrontal corridor. This provides anterolateral access to surgical lesions in the anterior cranial fossa, parasellar regions, brainstem, and medial temporal lobe.

Endoscope

With use of the endoscope, further areas can be accessed:

This approach is considered ideal for removal of many, if not most, planum and tuberculum sellae meningiomas, some olfactory groove meningiomas, and suprasellar craniopharyngiomas, particularly tumors with far lateral extensions. It is also ideal for many intraaxial tumors, including metastases and gliomas arising from the orbitofrontal, frontal pole, and medial temporal lobe regions. The use of endoscopy further extends the range and versatility of this keyhole approach and is considered an essential adjunct for allowing safe and maximal tumor removal. [2)].

Endoscopy is helpful to visualize hidden tumor remnants and maximize safe tumor removal [3)].

Metastatic tumors and select gliomas in this area are most amenable to this approach. Deeper intraaxial tumors can also be effectively accessed via this route with excellent clinical outcomes [4)].

This approach has been applied effectively in adults, but questions remain about its use in children-specifically with regard to adequate working space, effectiveness for achieving the desired results, cosmesis, and complications.

Dlouhy et al., conducted a retrospective review of more than 450 cases involving patients of all ages who had undergone a supraorbital eyebrow approach performed by the senior author (C.T.) from 1995 to 2013. Only cases involving patients younger than 18 years with a minimum follow-up of 6 weeks were included in this study. All inpatient and outpatient records were retrospectively reviewed and clinical/operative outcomes, cosmetic results, and complications were recorded. In the present article, the authors briefly describe the surgical approach and highlight any differences in applying it in children. RESULTS Fifty-four pediatric patients who had undergone a supraorbital eyebrow approach met inclusion criteria. The pathological conditions consisted mostly of tumors or other resectable lesions. In a total of 51 resectable lesions, 44 surgeries resulted in a gross-total (100%) resection and 7 cases resulted in subtotal (50%-99%) resection. The endoscope assisted and expanded visualization or provided access to areas not reached by standard microscopic visualization in all cases. Cosmetic outcomes were excellent. In all cases, the incisional scar was barely visible at 6 weeks. In 3 cases a minor bone defect was observed on the forehead. Given the small size of the frontal sinus in children, no frontal sinus breaches occurred. Additionally, no CSF leak or wound infection was identified.

The supraorbital eyebrow approach is extremely effective in achieving desired results in properly selected cases in patients of all pediatric age ranges, from infants to teenagers. There is sufficient working space for the endoscope and all instruments, allowing for endoscopic assistance and bimanual surgical technique. Cosmetic results are excellent, and complications related to the approach are minimal [5)].

The location of the eyebrow incision demands a meticulous cosmetic closure, but, with proper technique, cosmetic results are excellent [6].

Craniopharyngioma

Is safe for resection of craniopharyngiomas with retrochiasmatic extension. This approach offers a reasonable surgical corridor for resection of the retrochiasmatic tumor component and can be enhanced using endoscopic assistance [7].

1)
http://california.providence.org/~/media/Images/Providence%20CA/BTC/Supraorbital_1.jpg
2)
Wilson DA, Duong H, Teo C, Kelly DF. The supraorbital endoscopic approach for tumors. World Neurosurg. 2014 Jul-Aug;82(1-2):e243-56. doi: 10.1016/j.wneu.2013.02.002. Epub 2013 Feb 5. Review. PubMed PMID: 23395805.
3)
McLaughlin N, Ditzel Filho LF, Shahlaie K, Solari D, Kassam AB, Kelly DF. The supraorbital approach for recurrent or residual suprasellar tumors. Minim Invasive Neurosurg. 2011 Aug;54(4):155-61. doi: 10.1055/s-0031-1284401. Epub 2011 Sep 15. PubMed PMID: 21922443.
4)
Ditzel Filho LF, McLaughlin N, Bresson D, Solari D, Kassam AB, Kelly DF. Supraorbital eyebrow craniotomy for removal of intraaxial frontal brain tumors: a technical note. World Neurosurg. 2014 Feb;81(2):348-56. doi: 10.1016/j.wneu.2012.11.051. Epub 2013 Jan 23. PubMed PMID: 23352966.
5)
Dlouhy BJ, Chae MP, Teo C. The supraorbital eyebrow approach in children: clinical outcomes, cosmetic results, and complications. J Neurosurg Pediatr. 2014 Nov 14:1-8. [Epub ahead of print] PubMed PMID: 25396702.
6)
Gazzeri R, Nishiyama Y, Teo C. Endoscopic supraorbital eyebrow approach for the surgical treatment of extraaxialand intraaxial tumors. Neurosurg Focus. 2014 Oct;37(4):E20. doi: 10.3171/2014.7.FOCUS14203. PubMed PMID: 25270140.
7)
Tawk RG, Binning MJ, Thomas JM, Siddiqui AH, Grand W. Transciliary supraorbital approach (eyebrow approach) for resection of retrochiasmatic craniopharyngiomas: an alternative approach, case series, and literature review. J Neurol Surg A Cent Eur Neurosurg. 2014 Sep;75(5):354-64. doi: 10.1055/s-0033-1358609. Epub 2014 Jun 4. PubMed PMID: 24897027.