

Anterior skull base meningioma case series

2023

Fifty-nine patients who underwent excision of anterior skull base midline meningiomas through a unilateral pterional craniotomy between 2015 and 2021 were retrospectively analyzed. The surgical technique and patient outcomes in the context of visual, behavioral, olfaction, and quality of life were evaluated during the follow-up. Results A total of 59 consecutive patients were assessed over an average follow-up period of 26.6 months. Twenty-one (35.5%) patients had planum sphenoidale meningioma. Olfactory groove and tuberculum sellae meningioma groups consist of 19 (32%) patients each. Visual disturbance was the predominant symptom with almost 68% of patients presenting with it. A total of 55 (93%) patients had complete excision of the tumor with 40 patients (68%) achieving Simpson grade II excision, and 11 (19%) patients had Simpson grade I excision. Among operated cases, 24 patients (40%) had postoperative edema among which 3 (5%) patients had irritability and 1 patient had diffuse edema requiring postoperative ventilation. Only 15 (24.6%) patients had contusions of the frontal lobe which were managed conservatively. Five patients (50%) with seizures had an association with contusion. Sixty-seven percent of patients had improvements in vision and 15% of patients had stable vision. Only eight (13%) patients had postoperative focal deficits. Ten percent of patients had new-onset anosmia. The average Karnofsky score was improved. Only two patients had recurrence during follow-up. Conclusion A unilateral pterional craniotomy is a versatile approach for the excision of anterior midline skull base meningioma, even for the larger lesions. The ability of this approach in the visualization of posterior neurovascular structures at the earlier stages of surgery while avoiding the opposite frontal lobe retraction and frontal sinus opening makes this approach preferable over the other approaches ¹⁾.

Between January 2014 and June 2021, 96 patients with anterior skull base meningiomas underwent surgery at the Sanbo Brain Hospital of Capital Medical University. A total of 96 patients with nonintracranial space-occupying lesions were selected as the control group. The height of the upward bulging of the [planum sphenoidale](#) was measured and classified. The authors performed univariate and multivariate analyses to evaluate the rate and effects of upward bulging of the PS.

Results: The PS upward bulging rate was 23.00% versus 66.70% ($P < 0.001$) between the control and meningioma groups. Multiple linear regression showed that it was correlated with the tumor midsagittal anteroposterior length ($P = 0.025$) and the midsagittal height diameter ($P = 0.012$). According to the height of PS upward bulging, it was divided into types 1, 2, and 3. The tumor gross-total resection rates were 96.9%, 92.3%, and 76.0%, respectively ($P = 0.042$).

Anterior skull base meningiomas involving the tuberculum sellae area can cause PS upward bulging, which lowers the tumor resection rate and should be considered while determining the treatment approach ²⁾.

2022

Fifty-four patients with ASBM (olfactory groove meningioma [OGM], $n = 19$ and planum

sphenoidale/tuberculum sellae meningioma [PSM/TSM], n = 35) operated at a single center over 7 years were retrospectively analyzed. Results The overall rate of gross total resection (GTR) was higher in OGM (15/19, 78.9%) than PSM-TSM group (23/35, 65.7%, p = 0.37). GTR rate with OGM was 90% and 75% with transcranial approaches (TCA) and EEA. Death (n = 1) following medical complication (TCA) and cerebrospinal fluid leak requiring re-exploration (n = 2, one each in TCA and EEA) accounted for the major complications in OGM. For the PSM/TSM group, the GTR rates were 73.3% (n = 11/15), 53.8% (n = 7/13), and 71.4% (n = 5/7) with TCA, EEA, and SOKHA, respectively. Seven patients (20%) of PSM-TSM developed major postoperative complications including four deaths (one each in TCA and SOKHA, and two in EEA groups) and three visual deteriorations. Direct and indirect vascular complications were common in lesser invasive approaches to PSM-TSM especially if the tumor has encased intracranial arteries. Conclusion No single approach is applicable to all ASBMs. TCA is still the best approach to obtaining GTR but has tissue trauma-related problems. SOKHA may be a good alternative to TCA in selected PSM-TSMs, while EEA may be an alternate option in some OGMs. A meticulous patient selection is needed to derive reported results of EEA for PSM-TSM ³.

2018

Bernat et al., from the Department of Neurosurgery [Toronto](#) Western Hospital, La Pitié-Salpêtrière hospital, [Paris](#), France. King Faisal Specialist Hospital and Research Center, [Riyadh](#), Ain Shams University, [Cairo](#), Egypt, performed a retrospective analysis of patients submitted to [endoscopic endonasal approach](#) or [transcranial approach](#) for anterior skull base meningiomas (ASBM) resection from May 2006 to January 2016 Clinical, radiological and pathology data were retrieved for analysis. Tumor size, location, surgical technique, extent of resection and tumour grade were assessed. The two groups were compared to identify predictors and differences regarding tumor recurrence.

Fifty-two patients (17 Olfactory Groove meningioma & 35 Tuberculum sellae meningioma) were included; 26 (6 Olfactory Groove meningioma & 20 Tuberculum sellae meningioma) underwent [endoscopic endonasal approach](#) and 26 (13 Olfactory Groove meningioma & 13 Tuberculum sellae meningioma) [transcranial approach](#), with a mean follow up of 41 months. GTR was achieved in 38 (73%) patients (18 (69%) in [endoscopic endonasal approach](#) and 20 (77%) in [transcranial approach](#)). Eight (15 %) patients presented with [recurrence](#) (5 (19 %) in [endoscopic endonasal approach](#) group; 3(11.5%) in [transcranial approach](#) group without statistical difference (p= 0.69). Among the recurrences, GTR had been achieved in 1 case of each group. In group [endoscopic endonasal approach](#), one patient underwent [transcranial approach](#) for a [recurrent tumor](#) and another patient was referred for [radiosurgery](#).

This study has shown an overall similar [recurrence](#) rate of [Anterior skull base meningioma](#) regardless the [technique](#) used. However analysis of larger series with longer follow-up is necessary to clearly define the [indications](#) and to fully validate the efficacy of [endoscopic endonasal approach](#) ⁴.

A total of 35 patients underwent endoscopic endonasal resection of anterior cranial base meningiomas from October 2002 to October 2005. Degree of resection by tumor location was as follows: 10 of the 12 (83%) patients with olfactory groove meningiomas planned for complete resection underwent gross total (seven of 12) or near-total (>95%) (three of 12) resection (67% of all 15 olfactory tumors); 12 of 13 patients (92%) with tuberculum meningiomas underwent gross (11 of 13) or near (>95%) (one of 13) total resection; five patients diagnosed with petroclival meningiomas

had successful resection of the parasellar portion of their tumors with relief of visual symptoms (no patients underwent complete resection of their tumors via the endoscopic, endonasal approach); two giant petroclival meningiomas were debulked with 63 and 89% resection, respectively. All patients experienced resolution or improvement of visual symptoms. No patient experienced permanent worsening of vision after surgery. Only one (3%) patient without preoperative endocrine dysfunction experienced a new, permanent pituitary deficit, diabetes insipidus. One (3%) patient experienced a new neurological deficit after experiencing a hemorrhage 3 weeks after surgery. The postoperative cerebrospinal fluid leak rate was 40% (14 of 35) and varied by tumor location. All leaks were resolved without craniotomy. There were no cases of bacterial meningitis. One patient developed a superinfection of a sterile granuloma from a sinusitis 2 years after surgery. There were two cases of deep venous thrombosis and one pulmonary embolus. There were no operative or perioperative deaths.

Conclusion: Cranial base meningiomas can be successfully managed via a purely endoscopic endonasal approach with acceptable morbidity and mortality rates. The extent of resection is guided by patient factors and symptoms, not by approach. This series had a high cerebrospinal fluid leak rate. With the evolution of new reconstruction techniques, these rates have been substantially reduced ⁵⁾.

1)

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