Management of Large and Complex Sellar and Suprasellar Pathology - Extended Endonasal Approaches

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Abstract

Endoscopic endonasal techniques have been well established in the realm of pituitary surgery; however, their application to giant pituitary tumours and suprasellar pathology can be a challenging endeavor with a steep learning curve. This poster presentation explores the authors case series of giant pituitary tumours and suprasellar pathology that were resected with the application of extended endoscopic endonasal approaches (EEEA). In total 23 Giant Pituitary tumours, 6 Craniopharyngiomas and 5 tuberculum sellae meningiomas were resected. Gross total resection was achieved in 18 of 23 giant pituitary tumours; 4 of the 6 craniopharyngiomas; and in 4 of the 5 tuberculum sellae meningiomas. The learning curve to these procedures, management of skull base reconstruction and possibilities for excellent resections will be discussed. Images and surgical videos are included.

Introduction

Extended endoscopic endonasal surgical approaches play a critical role in the treatment of giant pituitary tumors and other suprasellar pathologies by providing a minimally invasive, direct route to the skull base. These techniques allow for improved visualization and access to complex lesions extending beyond the sella, including those involving the cavernous sinus, clivus, and optic apparatus. By avoiding brain retraction and external incisions, extended endonasal approaches reduce morbidity while enabling effective tumor resection, preservation of neurovascular structures, and restoration of normal anatomy.

Methods and Materials

Herein, we present a single-surgeon case series of giant pituitary tumours and suprasellar pathology where resection was achieved using the extended endoscopic endonasal approach between May 2022 and June 2024.

Pathology	Number of Cases
Giant Pituitary Tumors	23
Craniopharyngiomas	6
Tuberculum Sellae Meningiomas	5
Total	**34**

Table 1. Patient cohort and their pathological entity

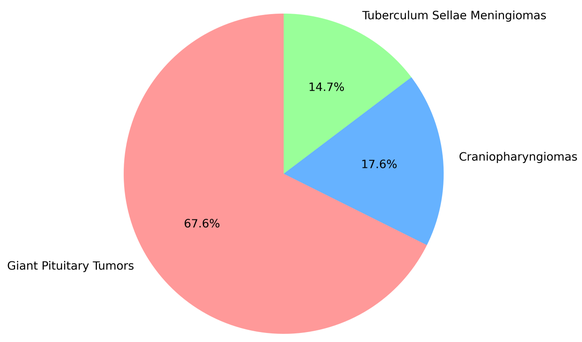
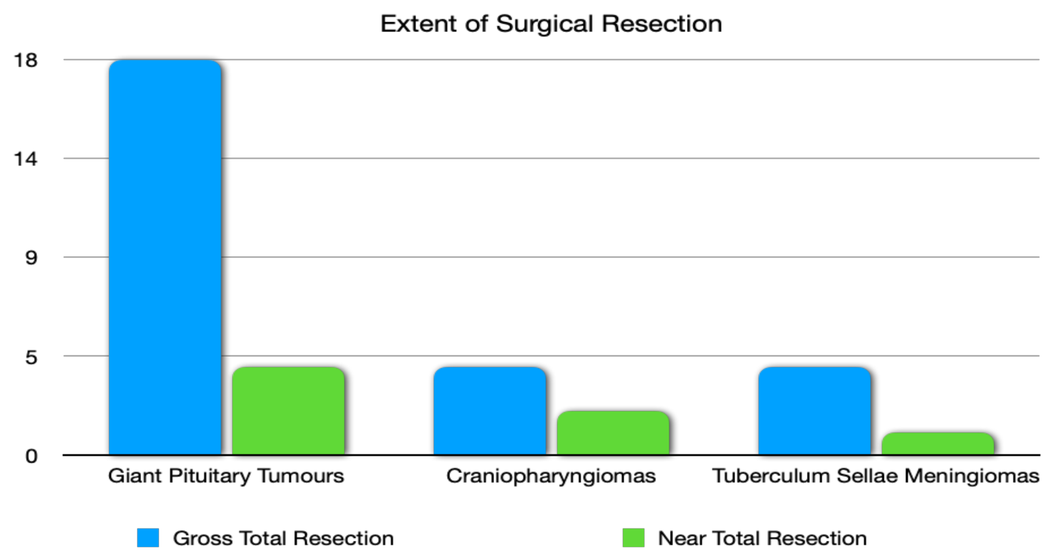


Chart 1. Pie chart of pathology distribution in cohort

Outcome measured: extent of surgical resection

Results



Discussion

The EEEA has become a cornerstone in the surgical management of sella and suprasellar pathologies. It is minimally invasive, avoiding external incisions and brain retraction, which reduces recovery time and morbidity. High-definition endoscopes provide enhanced visualization, enabling precise tumor resection and access to complex areas like the suprasellar and parasellar regions. EEEA achieves high rates of GTR with significant improvements in visual outcomes with optic nerve decompression.[1] Advancements in closure techniques have minimized complications like CSF leaks, making it a safe and effective surgical option.[2] Some challenges, include a steep learning curve and limited lateral reach, making it ideal for midline lesions. Additionally, while visual outcomes are often improved, endocrine dysfunctions, such as diabetes insipidus, may persist or develop postoperatively.

Illustrative Case 1

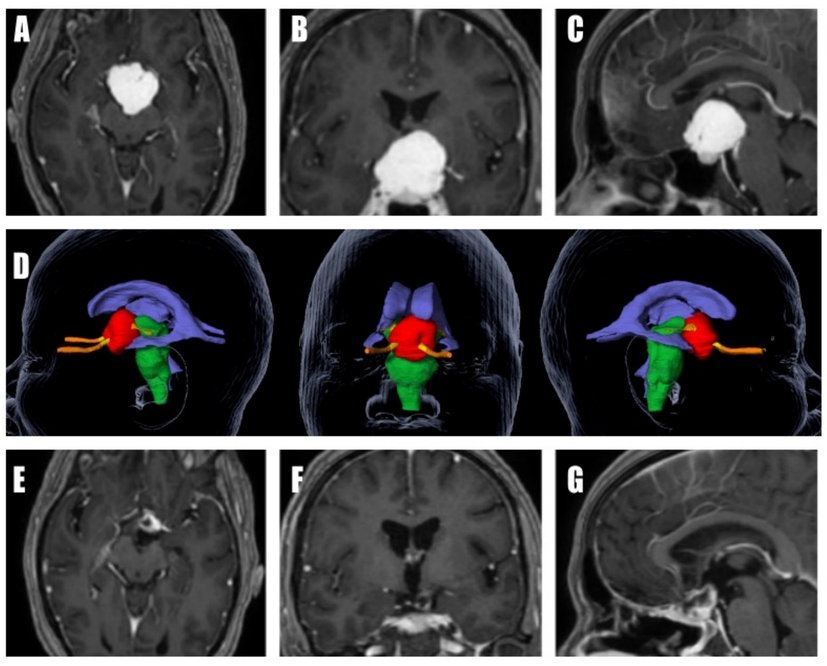


Figure 1. Magnetic resonance imaging of middle-aged patient with giant pituitary adenoma

A-C: *preoperative* T1-weighted post-contrast MRI views of axial, coronal and sagittal planes, respectively.

D: preoperative 3D reconstruction of tumour depicting its anatomical relations.

E-G: *post-operative* T1-weighted post-contrast MRI views of axial, coronal and sagittal planes, respectively.

Illustrative Case 2

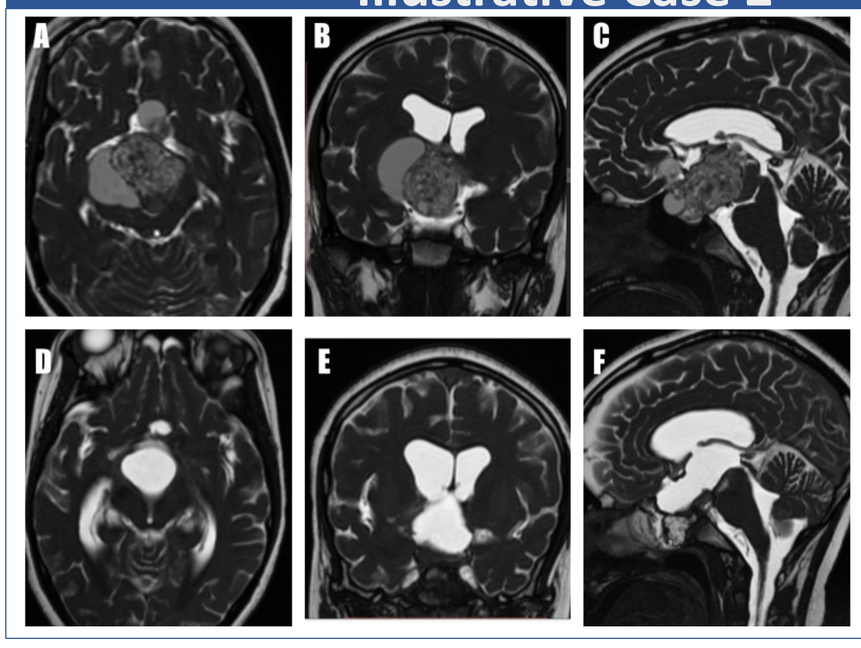


Figure 2. Magnetic resonance imaging of young patient with craniopharyngioma

A-C: *pre-operative* T2-weighted MRI of axial, coronal and sagittal views, respectively.

D-F: *post-operative* T2-weighted MRI of axial, coronal and sagittal views depicting gross total resection, respectively.

Illustrative Video

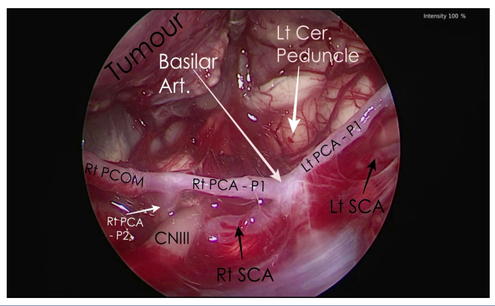


Figure 3. Intra-operative video attachment of Case 2 above

URL link:
https://drive.google.com/file/d/1ZFH5l5zxCn7iALDzmbMR1QIw9KL-Re-X/view?usp=sharing

Illustrative Case 3

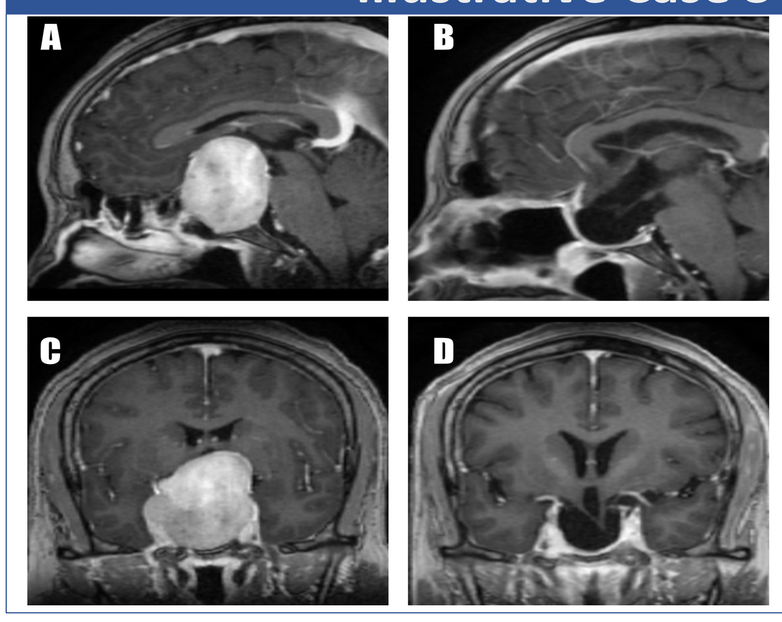


Figure 4. Magnetic resonance imaging of middle-aged patient with giant pituitary adenoma

A&B: *pre- & postoperative* T1-weighted post-contrast MRI sagittal views, respectively.

C&D: *pre- & postoperative* T1-weighted post-contrast MRI coronal views, respectively.

Conclusions

Extended endoscopic endonasal surgery is a highly effective, minimally invasive approach for managing sella and suprasellar pathology. It offers excellent visualization, reduced morbidity, and improved outcomes compared to traditional techniques. The steep learning curve and limited lateral reach remain as challenges.

Contact

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References

1. Jamaluddin, M.A., Patel, B.K., George, T., Gohil, J.A., Biradar, H.P., Kandregula, S., Hv, E., Nair, P., 2021. Endoscopic Endonasal Approach for Giant Pituitary Adenoma Occupying the Entire Third Ventricle: Surgical Results and a Review of the Literature. World Neurosurgery 154, e254–e263. https://doi.org/10.1016/j.wneu.2021.07.022
2. Wu, K. C., Laws, E. R., Jr., & Jane, J. A., Jr. (2022). Editorial. Revisiting the safety of the endoscopic endonasal approach in the modern era. Journal of Neurosurgery, 136(2), 389-391. https://doi.org/10.3171/2020.12.JNS204122