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Case Report

Craniopharyngioma versus pituitary adenoma: a case report

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ABSTRACT

Craniopharyngioma is a rare, benign epithelial tumour of Rathke's pouch, involving the sellar and suprasellar region. Pituitary adenoma is most common tumour of Intrasellar region. Though benign, craniopharyngioma can cause significant morbidity because of their close relationship with optic pathways, hypothalamus and major neuro vascular structures. This case report involves a 7-year-old child with features of raised intracranial pressure, radiological evidence of sellar-suprasellar mass with obstructive hydrocephalus. Altered serum hormone levels and computed tomography (CT) brain findings, biopsy report confirmed diagnosis. Subtotal resection followed by radiotherapy with hormone replacement was done. Because of profound metabolic, visual, and endocrine challenges, multidisciplinary team comprising neurosurgeons, paediatric endocrinologists, ophthalmologists, and neuropsychologists are required to optimize their overall quality of life.

Keywords: Craniopharyngioma, Tumour, Neuro vascular structures

INTRODUCTION

Craniopharyngioma is a rare, benign epithelial tumour arising from Rathke's pouch, involving the sellar and suprasellar region -3% of intracranial tumours.[1] Pituitary adenoma is a tumour of Intrasellar region, 10-15% of intracranial tumours occurring in adults.[2]

Craniopharyngioma shows bimodal age distribution with a major peak during 5-15 years of life another peak in adults. In children, craniopharyngioma presents with headache, visual disturbances, growth retardation, diabetes incipidus. Pituitary adenomas with headache, prolactinoma and Cushing's disease. Calcification and a mixed solid -cystic suprasellar lesion with hydrocephalus radiologically represents craniopharyngioma.

Craniopharyngioma can cause significant morbidity because of their close relationship with optic pathways, hypothalamus and major neuro vascular structures.[3]

CASE REPORT

A 7-year-old male child, presented with low grade fever without chills for 1 day, headache for the past 6 months. It was non radiating headache, lasted for 5-10 minutes, aggravated by loud shouting with no specific relieving factors. There was no history of seizures. On examination, the child was conscious and bilateral pupils were reactive. Serum Prolactin level of 28.33 ng/ml. Serum thyroid profile, cortisol and growth hormone (GH) levels were with in normal reference range for that age. Computed tomography (CT) brain revealed a well-defined lobulated sellar-suprasellar mass measuring 3.7×3.6×2.6 cm (CC×AP×TR), with predominant calcification extending into the interpeduncular cistern and third ventricle and causing obstructive hydrocephalus. The findings were suggestive of craniopharyngioma. Biopsy report confirmed as stratified squamous epithelium with peripheral palisading of basal cells with centre stellate reticulum, nucleated squamous cells, features were

suggestive of craniopharyngioma - adamantinomatous type World Health Organization (WHO) grade-1.



Figure 1: CT image of a child with craniopharyngioma in sellar and suprasellar region.

DISCUSSION

Craniopharyngiomas are rare, histologically benign (WHO grade 1) but clinically aggressive epithelial tumors arising from remnants of Rathke's pouch with bimodal age distribution. In the pediatric demographic, the adamantinomatous craniopharyngioma (ACP) subtype is exclusively predominant.[4]

Pathophysiology and molecular landscape

The pathogenesis of pediatric ACP is due to dysregulated embryonic development. At the molecular level, 96% of ACP cases have mutations in the *CTNNB1* gene, which encodes β-catenin. This mutation disrupts the Wnt/β-catenin signaling pathway, leading to the nuclear accumulation of β-catenin and the formation of characteristic epithelial "whorls" or cell clusters. These cell clusters act as paracrine signaling hubs that drive tumor proliferation, cyst fluid accumulation, and local tissue invasion, distinguishing them from adult-onset papillary variants which are driven primarily by *BRAF* V600E mutations.[5,6]

Clinical presentation and diagnostic findings

Symptoms arise from local mass effect on adjacent neurovascular structures. Increased intracranial pressure (ICP)-secondary to third ventricle compression and obstructive hydrocephalus-frequently presents as progressive headaches, morning emesis, and altered sensorium. Visual deficits are highly prevalent in pediatric cases. As the tumor expands suprasellarially, it compresses the optic chiasm, typically manifesting as bitemporal hemianopsia or asymmetric visual acuity loss. Endocrine dysfunction is also present at diagnosis in the majority of patients, driven by hypothalamic-pituitary axis disruption. GH deficiency is the most common endocrinopathy, presenting clinically as growth failure or a deceleration in height velocity. Central diabetes insipidus (DI), characterized by polyuria and polydipsia is also a hallmark finding that points toward direct hypothalamic or pituitary stalk infiltration.[7] Magnetic resonance imaging (MRI) provides exceptional soft-tissue contrast to delineate the tumor's adherence to the optic chiasm, internal carotid arteries, and the floor of the third ventricle. CT scans offer essential complementary value by distinctly highlighting punctate or coarse tumoral calcifications, a radiological signature found in over 90% of paediatric ACP cases. Histologically, ACP is characterized by a stratified squamous epithelium exhibiting peripheral palisading, stellate reticulum, and calcified "wet keratin" nodules surrounded by cysts filled with dark, cholesterol-rich "machinery-oil" fluid.

Therapeutic management and dilemmas

Historically, aggressive gross total resection (GTR) was pursued to minimize recurrence risks. However, because ACPs lack a true surgical capsule and frequently display dense adhesions or infiltrative finger-like projections into the hypothalamus and optic pathways, aggressive dissection carries a prohibitive risk of permanent neurological damage.[8,9] Consequently, modern consensus favours a multidisciplinary, organ-sparing approach. If a tumor directly invades the hypothalamus, a planned subtotal resection (STR) or cyst decompression is executed to safely relieve mass effect on the optic structures and treat hydrocephalus. This conservative surgical strategy is subsequently paired with adjuvant localized radiation therapy, such as fractionated external beam radiotherapy or proton beam therapy. This combined approach achieves long-term local tumor control rates comparable to GTR while significantly preserving the child's functional status and neurocognitive reserve.[10,11]

This case was treated by minimally invasive endonasal subtotal resection combined with external beam radiation along with hormone replacement therapy.

Long-term morbidities and prognosis

Despite excellent overall survival rates exceeding 90%, pediatric craniopharyngioma survivors face lifelong, severe metabolic and endocrine morbidities. The most devastating long-term complication is hypothalamic obesity (HO), which occurs in up to 75% of patients. This creates a state of perceived central starvation, causing a drastic drop in sympathetic output, intractable hyperphagia, decreased energy expenditure, and rapid, treatment-resistant weight gain.

Furthermore, near-universal panhypopituitarism follows treatment, requiring lifelong hormone replacement therapies including recombinant growth hormone, levothyroxine, hydrocortisone, and desmopressin.

CONCLUSION

Because of these profound metabolic, visual, and endocrine challenges, these children require rigorous, long-term monitoring by a multidisciplinary team comprising neurosurgeons, pediatric endocrinologists, ophthalmologists, and neuropsychologists to optimize their overall quality of life.

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REFERENCES

1. Hasegawa H, Jentoft ME, Young WF Jr, Lakomkin N, Van Gompel JJ, Link MJ, et al. Collision of Craniopharyngioma and Pituitary Adenoma: Comprehensive Review of an Extremely Rare Sellar Condition. World Neurosurg. 2021;149:e51-62.
2. Pang JC, Chung DD, Wang J, Abiri A, Lien BV, Himstead AS, et al. Characteristics and Outcomes in Pediatric Versus Adult Craniopharyngiomas: A Systematic Review and Meta-Analysis. Neurosurgery. 2023;92(6):1112-29.
3. Müller HL, Merchant TE, Warmuth-Metz M, Martinez-Barbera JP, Puget S. Craniopharyngioma. Nat Rev Dis Primers. 2019;5(1):75.
4. Louis DN, Perry A, Wesseling P, Brat DJ, Cree IA, Figarella-Branger D, et al. The 2021 WHO Classification of Tumors of the Central Nervous System: a summary. Neuro Oncol. 2021;23(8):1231-51.
5. Campanini ML, Almeida JP, Martins CS, de Castro M. The molecular pathogenesis of craniopharyngiomas. Arch Endocrinol Metab. 2023;67(2):266-75.
6. Brastianos PK, Taylor-Weiner A, Manley PE, Jones RT, Dias-Santagata D, Thorner AR, et al. Exome sequencing identifies BRAF mutations in papillary craniopharyngiomas. Nat Genet. 2014;46(2):161-5.
7. Magerman C, Boros E, Preziosi M, Lhoir S, Gilis N, De Witte O, et al. Childhood craniopharyngioma: a retrospective study of children followed in Hôpital Universitaire de Bruxelles. Front Endocrinol (Lausanne). 2024;15:1297132.
8. Müller HL. Management of Acquired Hypothalamic Obesity After Childhood-Onset Craniopharyngioma-A Narrative Review. Biomedicines. 2025;13(5):1016.
9. Massimi L, Palombi D, Musarra A, Bianchi F, Frassanito P, Tamburrini G, et al. Adamantinomatous craniopharyngioma: evolution in the management. Childs Nerv Syst. 2023;39(10):2613-32.
10. Tang AR, Haizel-Cobbina J, Khalid MU, Peter-Okaka UI, Prosak OL, Mushtaq N, et al Global pediatric craniopharyngioma management modalities and outcomes. Childs Nerv Syst. 2024;40(1):47-56.
11. Lara-Velazquez M, Mehkri Y, Panther E, Hernandez J, Rao D, Fiester P, et al. Current Advances in the Management of Adult Craniopharyngiomas. Curr Oncol. 2022;29(3):1645-71.

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