One man with "two" diseases - **Co-existence of craniopharyngioma and functioning pituitary adenoma presenting with acromegaly**: A case report and literature review on pituitary collision tumour

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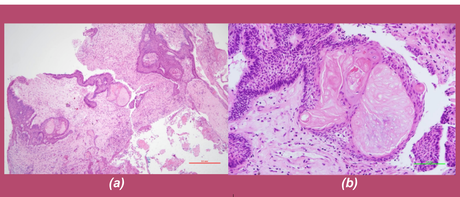
Objectives

To report a rare case of collision tumor presenting with acromegaly and conduct a literature review of pituitary collision tumours

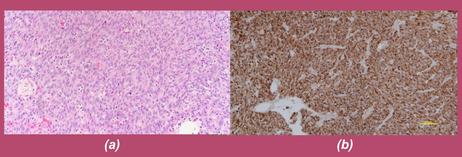
Methods

This is to report a rare case of collision craniopharyngioma (CP) and pituitary adenoma (PA) presenting as acromegaly. A literature review was conducted to reveal past literature on collision tumors (n = 33) and the association of craniopharyngioma (n = 8). Integrated quantitative and descriptive analyses were carried out.



(a) (b)

Figure 1. (a) (H&E, 40x magnification) Adamantinomatous craniopharyngioma. The tumour shows anastomosing islands of squamous epithelium with prominent basal palisading, stellate reticulum-like structure, and characteristic wet keratins. (b) (H&E, 200x magnification) Adamantinomatous craniopharyngioma. High power view showing squamous epithelium with prominent basal palisading, stellate reticulum-like structure, and characteristic wet keratins.



(a) (b)

Figure 2. (a) (H&E 100x) Pituitary adenoma. The tumour consists of sheets of plump spindly cells with rich delicate vasculature. The cells display ovoid monotonous nuclei with stippled chromatin. (b) (IHC for growth hormone) Pituitary adenoma. The tumour cells are diffusely positive for growth hormone and prolactin (not shown here).

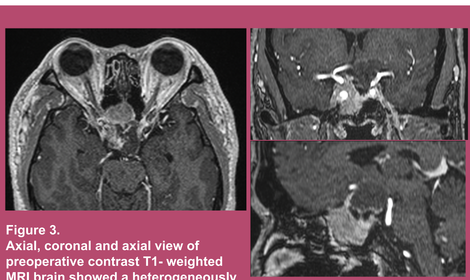


Figure 3.
Axial, coronal and axial view of preoperative contrast T1- weighted MRI brain showed a heterogeneously enhanced sellar lesion with suprasellar extension compressing the optic apparatus

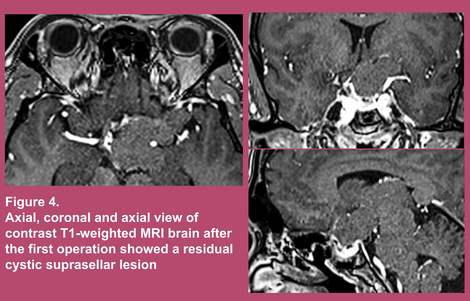


Figure 4.
Axial, coronal and axial view of contrast T1-weighted MRI brain after the first operation showed a residual cystic suprasellar lesion

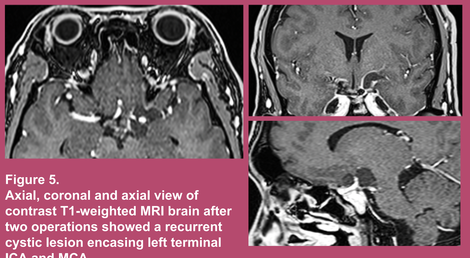


Figure 5.
Axial, coronal and axial view of contrast T1-weighted MRI brain after two operations showed a recurrent cystic lesion encasing left terminal ICA and MCA

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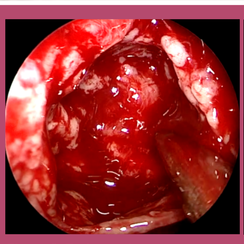

Figure 6. Endoscopic appearance during the 1st operation showing a yellowish necrotic pituitary adenoma

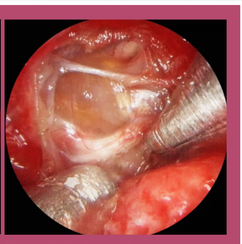

Figure 7. Endoscopic appearance during the 2nd operation showing a multicystic lesion with machine oil content and calcification arising from the pituitary stalk

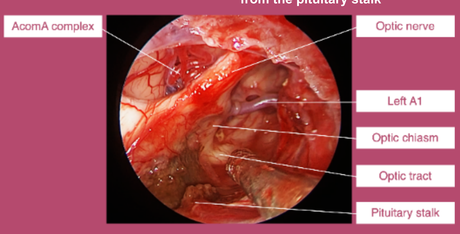

Figure 8. Endoscopic view during the 2nd operation after tumor excision

Videos of the two operations can be viewed here.

1st OT

2nd OT

Results

- A 49-year-old patient with acromegaly was diagnosed to have a 3.4 x 3.7 x 4.3 cm heterogeneous sellar mass with chiasmatic compression on MRI. Immunohistochemistry confirmed a growth hormone and prolactin-secreting pituitary adenoma after an urgent transsphenoidal partial tumor excision.
- An interval growth of the residual mixed solid/cystic tumor with unresolved optic nerve compression compelled an extended transsphenoidal total excision three months later. Intraoperative and pathological findings were consistent with a craniopharyngioma, with no characteristic nuclear staining of beta-catenin and a negative stain for growth hormone.
- Among the 22 case reports with diagnoses of both CP and PA, 15 (68.2%) of them were pathologically proven concurrent tumors. And only 4 cases (18.2%) reported acromegaly both clinically and biochemically. There remains an unclear linkage between growth hormone excess and IGF-1R expression on the effect of craniopharyngioma development.

Types	Number of cases (n)
Concurrent tumour confirmed histo-pathologically	**15**
Recurrent tumour	**7**
Total	**22**

Clinical presentation	Number of cases (n)
Visual disturbance	19
Headache	14
Endocrine disturbance	8
Acromegaly	**4**
Memory / cognitive impairment	2

Table 1,2. Results of literature review based on tumour types and clinical presentations

Discussion

- Adamantinomatous CP was well known to result from mutation of the β-catenin gene that prevents the degradation of the β-catenin protein. Little has known about the effect of growth hormone on the pathogenesis of craniopharyngioma.
- An in-vitro study was published describing the expression of insulin-like growth factor-1 receptor in a subgroup of craniopharyngioma. Stimulation by IGF-1 promotes its growth, whereas inhibition of IGF-1 receptor limits its growth suggesting the role of growth hormone on the pathogenesis in a subgroup of craniopharyngioma harboring IGF-1 receptors.

Conclusion

- The paucity of studies exploring the association of growth hormone and IGF-1R expression in craniopharyngioma warranted further research on the topic.
- Acromegaly, as an uncommon presentation of collision CP/PA, would be signage for relevant histopathological analyses.