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CASE REPORT

Pituitary Metastasis Masquerading as Pituitary Macroadenoma-from a Primary Follicular Thyroid Malignancy

Nikitha Sriramaneni*, Kalra Pramila, Kapali Aravind S, Furtado Sunil V, K.G Kallur, Baratam Hari Kiran

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Sriramaneni Nikitha, D.M, Senior Resident in Endocrinology, Ramaiah Medical College, Bengaluru, Email: snikitha3@gmail.com

Kalra Pramila, D.M, Professor and HOD of Endocrinology, Ramaiah Medical College, Bengaluru, Email: kalrapramila@gmail.com

Kapali Aravind S, M.Ch. Surgical Oncology, Professor in Surgical Oncology, Ramaiah Medical College, Bengaluru.

Furtado Sunil V, M.Ch Neurosurgery, Professor and HOD of Neurosurgery, Ramaiah Medical College, Bengaluru.

K.G Kallur, M.D, Nuclear Medicine, Director, Molecular Imaging, HCG, Bengaluru

Baratam Hari Kiran, D.M, Department of Endocrinology, Ramaiah Medical College, Bengaluru

Corresponding Author:

Kalra Pramila, D.M, Professor and HOD of Endocrinology, Ramaiah Medical College, Bengaluru, Email: kalrapramila@gmail.com

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Abstract

Background: Metastasis to the pituitary is very rare. Thyroid carcinoma as a primary source of pituitary metastasis is uncommon. Pituitary metastasis is common in posterior pituitary. Metastasis can also occur to anterior pituitary with varied presentations. **Case Description:** A 47-year-old lady presented with galactorrhoea, ptosis, diminished vision of the right eye, and headache from 6 months. She had a pituitary macroadenoma with suprasellar, para-sellar and infrasellar extension on evaluation. She underwent initial transnasal trans-sphenoidal decompression followed by pterional craniotomy with decompression of the residual tumour. The histopathology was metastatic tumor of sella. Further evaluation showed a thyroid nodule and bilateral lung nodules. With suspicion of a primary thyroid malignancy, total thyroidectomy was performed and biopsy report of the thyroid showed follicular carcinoma. **Conclusion:** Metastasis to the pituitary can be a rare presentation of thyroid cancer. It may masquerade a pituitary adenoma. **Key-words:** Sella, Pituitary metastases, Parasellar, Suprasellar, Diabetes Insipidus, Thyroid.

Key Messages: A high index of clinical suspicion is needed to diagnose pituitary metastases. A rapidly appearing mass in sella with parasellar, suprasellar extensions, diabetes insipidus at onset, sudden onset ophthalmoplegia, and a normal sized sella favor a diagnosis of pituitary metastasis.

Introduction

Pituitary/sellar metastases are rare and account for only 1% of all operated pituitary masses [1] and < 1% of all intracranial metastatic lesions. They may precede the diagnosis of primary malignancy in 20-30% of the cases [2]. The most common primary malignancies with metastasis to the pituitary are breast and lung carcinoma. Pituitary metastasis may be mistaken for pituitary adenoma due to similar radiological findings.

Case History:

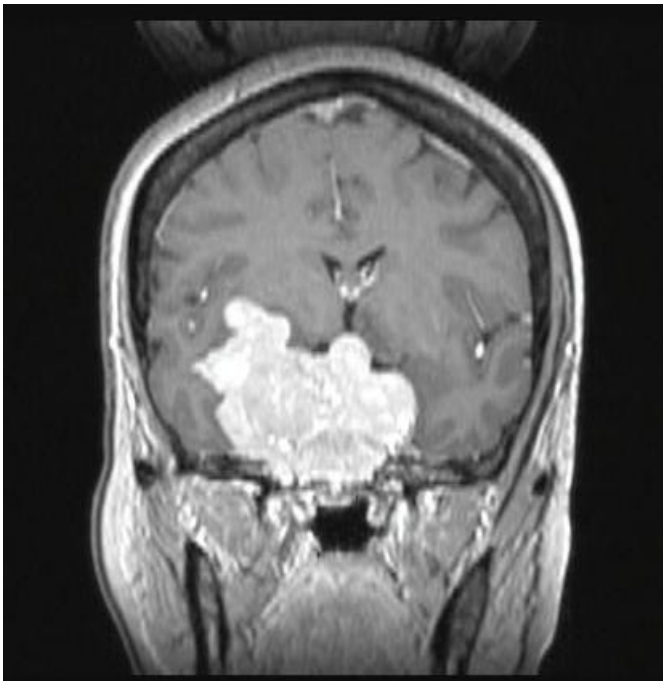


Figure 1: MRI pituitary: T1W post-contrast coronal image showing heterogeneously enhancing lobulated lesion superiorly abutting the base of the 3rd ventricle and parasellar extension causing compression over the medial temporal lobe on right side.

A 47-year-old lady presented with milk-like discharge from both breasts, drooping of right eyelid, diminished vision of right eye and headache from 6 months. She had significant unintentional weight loss in 3 months. Her menstrual cycles were regular. She had diabetes from 4 years.

Patient had right eyelid ptosis and right lateral rectus palsy. Visual acuity testing- finger movements on right side and able to count fingers from 2-meter distance on left side. Visual field testing revealed reduced right temporal vision.

An MRI Brain and orbit imaging with IV contrast revealed a large (3.8 cm x 6.7 cm x 4.6 cm) homogeneous enhancing mass lesion in the pituitary fossa extending into the parasellar, suprasellar, and infrasellar regions with encasement of the cavernous segment of both internal carotid arteries, elevating and compressing the optic chiasm and floor of the third ventricle suggestive of a large pituitary macroadenoma.

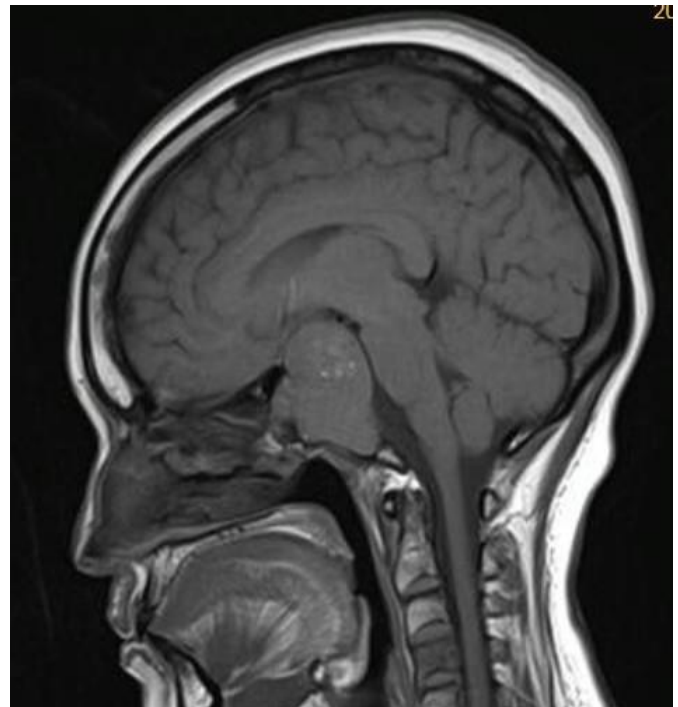


Figure 2: MRI pituitary: T1W post-contrast sagittal image showing an isointense mass lesion centered at the sella involving the clivus with suprasellar extension.

Baseline Investigations:

She had galactorrhea, diabetes insipidus, secondary hypothyroidism, and secondary hypocortisolemia. With a suspicion of invasive macroprolactinoma, a trial of cabergoline was given for 6 weeks. A repeat imaging because of progressive diminution of vision showed an increase in the size of the mass. She underwent endoscopic transnasal transsphenoidal tumor decompression. Post-op day-1 CT brain imaging showed residual tumor. A pterional craniotomy and tumor decompression was performed 5 days after the first surgery. Post-operatively she had transient diabetes insipidus (DI) which later progressed to permanent DI.

8 am serum cortisol	0.32 mcg/dl (low)
TSH	2.12
Total T4	40.3 nmol/l (low)
FSH	2.50 mIU/ml
LH	<0.216 mIU/ml
Prolactin	121.5 ng/ml (1: 10 dilution: 100.4 ng/ml)
Repeat serum prolactin (1:100 dilution)	215 ng/ml
GH baseline	0.3 ng/ml
OGTT- Serum GH 1 hr after 75gm oral glucose tolerance test	0.2 ng/ml
Sodium	141 meq/l
Potassium	4.4 meq/l
Creatinine	0.71 mg/dl
Random blood glucose	196 mg/dl
HbA1c	6.3%
Haemoglobin	12.7 gm/%
ESR	7 mm/1 st hr

The surgical biopsy showed a tumor composed of cells in follicular arrangement containing colloid-like material and suggestive of metastatic tumor of the sella. Immunohistochemistry of pituitary biopsy was positive for Cytokeratin, TTF-1(nuclear) and negative for synaptophysin, chromogranin and prolactin. MIB 1 labelling is 3-4%.

On further evaluation, an FDG-PET CT scan showed a metabolically active nodule (3.4 cm x 1.2 cm) in the left upper lobe of the thyroid, bilateral lung nodules (12 mm) and a residual mass (6.1 cm x 2.7 cm x 3.7 cm) in the sella and bilateral parasellar region with destruction of the sella. An ultrasound scan of the thyroid gland showed multinodular goiter with TIRADS-5 score. Left thyroid nodule FNAC was reported as Hashimoto's thyroiditis (Bethesda II). Serum thyroglobulin- 4804 ng/ml. serum calcitonin: <0.5 pg/ml. With suspicion of a primary thyroid malignancy, she underwent a total thyroidectomy and surgical biopsy report showed well-differentiated follicular carcinoma with capsular and vascular invasion.

After administering Injection Thyrogen, radioablation was performed thrice with I-131 with a duration of 6 months between consecutive ablations. Good tracer uptake was seen in the residual thyroid tissue in the

neck, sellar mass, and bilateral lung metastases with no abnormal uptake elsewhere

Discussion:

Clinical manifestations of pituitary metastasis include diabetes insipidus, hypopituitarism, headache, visual disturbances, ophthalmoplegia, and compression of adjacent structures by aggressive tumour masses. Short lag time between the onset of symptoms and clinical presentation favours pituitary metastases over pituitary adenoma. Hyperprolactinemia in the case reported could be due to the mass effect of the pituitary metastasis causing pituitary stalk compression.

Pituitary metastasis can involve the anterior and posterior lobes, but the neuro-hypophysis is mainly involved [3]. This likely accounts for diabetes insipidus being more common in patients with pituitary metastasis than in patients with other pituitary pathology [4]. A predilection for the tumor to infiltrate the posterior pituitary is due to its direct arterial supply. Therefore, the metastasis first localizes in the capillary bed of posterior pituitary and then reaches the anterior pituitary [5,6]. The patient reported in this study had diabetes insipidus at the onset of symptoms which later progressed to permanent diabetes insipidus.

Most cases of pituitary metastasis are diagnosed as a complication of disseminated malignancies with metastatic spread to other organs. Pituitary metastases are the initial presentation of an unknown primary tumour only in 20-30% of the cases and precede the diagnosis of malignancy [2]. Majority of patients are diagnosed between the age of 45 and 74 years with a mean age of ~60 years [2,7]. The male-to- female distribution is similar [2,8].

Ophthalmoplegia has a more discriminatory value than visual field defect in patients with pituitary metastasis. In the case reported, visual acuity and field of vision were compromised and she had ophthalmoplegia. Pituitary adenoma has relatively slow growth, benign course and may remain clinically silent for a long time, causing slow sellar enlargement, double flooring and destruction of the clinoid process. The absence of such findings is characteristic of metastatic disease, even with a tumour of similar size [9-11].

Metastasis to the pituitary can be a rare presentation of thyroid cancer. It may masquerade a pituitary adenoma.

A rapidly appearing mass in sella with parasellar, suprasellar extensions, diabetes insipidus at onset, sudden onset ophthalmoplegia, and a normal-sized sella favour a diagnosis of pituitary metastasis.

Conflict of Interest: There is no Conflict of Interest

Ethical Consideration: None

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