A Rare Case of Skull Base Metastasis from Follicular Carcinoma of Thyroid

Satheesh Kumar Bhandary · Vadisha Srinivas Bhat ·
M. Shwetha Shenoy

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Abstract We are reporting a case of skull base metastasis from follicular carcinoma of thyroid in an adult lady. She presented with the history of a longstanding thyroid swelling and recent onset epistaxis and diplopia. She was evaluated and diagnosed to have follicular carcinoma of thyroid with metastasis to the skull base. She underwent Total Thyroidectomy with modified neck dissection followed by Radioiodine ablation of the metastasis.

Keywords Follicular carcinoma · Thyroid · Metastasis · Skull base

Introduction

Thyroid malignancies are among the frequently encountered head and neck malignancies. Follicular carcinoma of the thyroid arises from the follicular cells of the thyroid. Among the differentiated thyroid cancers 13–18% is follicular carcinoma [1]. They either occur de-novo or as a malignant transformation in a long standing thyroid swelling [2]. They usually present as a solitary nodule and sometimes with symptoms or signs of metastasis. Follicular carcinomas tend to invade locally and metastasize distantly, rather than to local nodes, and are especially prone to metastasize to lung and bone [3]. Till date only 22 cases of thyroid malignancy with metastasis to skull base have been reported.

There is no protocol for treatment due to the rarity of the case. However, surgical excision of the primary lesion and radioiodine ablation of the residual and metastatic thyroid tissue is the preferred line of treatment.

Case

A 59 year old lady presented with history of Thyroid swelling for the past 30 years, which was gradually progressive with no history of abrupt increase in size or pain. She has no complaints suggestive of compression due to the swelling or Thyroid hormonal imbalance. She was not investigated for thyroid disease in the past.

Patient complained of episodes of spontaneous nasal bleeding from the past 3 months. The epistaxis began as blood stained nasal discharge and progressed to frank bleeding. There was no history of trauma to the nose. She also complained of double vision, more so on looking to the right side since the past 1 week. She gave history of occasional headache associated with projectile vomiting since 2 weeks. There was no history of seizures.

On examination, she was afebrile and had stable vitals. There were no signs of meningeal irritation.

A solitary swelling measuring 6 cm × 8 cm was noted involving the left lobe of the Thyroid, which was firm in consistency and the surface was nodular. There was no retrosternal extension. Bilateral carotid pulsations were palpable. Trachea was pushed to the right side. There was no clinically palpable cervical lymphadenopathy.

Nasal framework was normal. Anterior rhinoscopy showed pinkish, friable mass in right nasal cavity, which was bleeding on touch. The posterior part of the mass was seen in the nasopharynx, on posterior rhinoscopy. The

S. K. Bhandary · V. S. Bhat (✉) · M. S. Shenoy
Department of ENT, K S Hegde Medical Academy,
Deralakatte,
Mangalore, Karnataka, India
e-mail: bvadish@yahoo.co.in

Fig. 1 C T Scan Axial view showing Metastatic deposits in the skull base

Eustachian tube openings appeared normal and the choana was patent.

Ocular examination showed right lateral rectus palsy and immature cataract on right side with visual acuity of 6/24 on the right side. Pupillary reaction was present both directly and consensually.

Hemogram was normal. Thyroid function test showed elevated thyroid hormone levels. Her blood sugar and renal profile was normal. Cortisol levels were normal. Serum thyroglobulin was markedly elevated to more than 300 ng/ml (normal value: 0–55 ng/ml).

Fine Needle Aspiration Cytology of the thyroid gland showed features of follicular neoplasm.

She underwent diagnostic nasal endoscopy under local anesthesia, which showed pinkish polypoidal mass in the sphenothmoidal recess. Biopsy was taken from the lesion. Histological features of the biopsy were highly suggestive of metastatic follicular carcinoma from the thyroid.

CT scan of the nose, paranasal sinus and skull base showed a soft tissue density lesion involving the clivus, sphenoid sinus, posterior ethmoid air cells and the sella. The lesion appeared to be encasing the carotid artery (Fig. 1).

MRI scan of Head and neck with contrast showed mass of isointense signal intensity on T1 and T2 highly suggestive of metastatic involvement. Features of brainstem indentation were also noted. In the thyroid region, the left lobe appeared to be enlarged with isointense signals on T1 and inhomogeneously hyper intense on T2. The capsule appears to be intact. Features of retrosternal extension were also noted. Left Level III lymphadenopathy was identified.

The thyroid malignancy was staged as T3 N1 M1, STAGE IVC. Patient was taken up for total thyroidectomy

with Left modified neck dissection under general anaesthesia. Post operative period was uneventful.

Histopathology of the surgical specimen was reported as follicular carcinoma of thyroid with features of lymphatic and vascular invasion. Level III nodes showed features of metastasis.

After 4 weeks, patient underwent Iodine- 131 radioiodine scanning. It showed iodine uptake in the nasopharyngeal/nasal region which was suggestive of a functioning metastatic lesion from the thyroid (Fig. 2). She was later subjected to Radioiodine Ablation using orally administered 154.8 mCi of I -131.

She is receiving thyroxine hormone supplementation and calcium supplements and is on regular follow-up.

Discussion

Metastasis to skull base is a rarely occurring phenomenon in thyroid malignancies. Skull metastasis is uncommon, and is found in 2.5%–5.8% of cases of thyroid cancer [4]. Twenty two cases of follicular carcinoma with metastasis to the skull base have been reported worldwide till date. The method of spread of Thyroid Carcinoma into the skull and skull base is likely via the hematogenous route. Batson

Fig. 2 Iodine Scintigraphy showing radioiodine uptake at the skullbase

demonstrated a vertebral venous plexus which consisted of a valveless vascular bed within the spinal canal and extended from the skull to the pelvis [5]. Batson and Eckenhoff showed that there were multiple anastomoses and free connections between this venous plexus and the dural sinuses, the emissary veins of the skull as well as numerous junctions with the cervical plexus [6]. Recently arterial spread has also been suggested because of the association with secondary cutaneous locations in the territory of ipsilateral external carotid artery [7].

Akira Matsuno et al. [8], reviewed nineteen case reports published earlier and their case reports of two cases and concluded that the skull base metastasis is more common in females and the most common symptom due to skull base metastasis was cranial nerve palsy. This was also observed in our patient who had developed right sixth cranial nerve palsy causing diplopia.

Matsuno et al. also noted that the mean duration between initial diagnosis and metastasis to the skull base was 4 years. This cannot be applied to our patient because the exact duration of malignancy prior to metastasis is not known as the patient sought medical help only after the onset of epistaxis, which was nearly 30 years after developing thyroid swelling.

In spite of extensive skull base metastasis our patient was in good general condition and was ambulatory.

There is no evidence based treatment protocol for skull base metastasis in thyroid malignancy because of the rarity of the case. However, it is suggested that thyroidectomy and removal of as many metastasis as possible should be the mainstay of treatment. In skull base metastasis, this may not be feasible because of the presence of vital structures and possible profuse bleeding. In such cases, the mainstay of treatment will be surgical removal of the primary in the thyroid along with lymph node metastasis and I-131 ablation if uptake is noted in the metastasis. If a cold nodule is noted on

scintigraphy, external beam radiation will be the choice of treatment [8].

It is noted that only 17% of metastatic lesions to the brain take up iodine-131.

In our patient, uptake was noted in the nasal region on scintigraphy which was done after thyroidectomy. She underwent I-131 ablation for the metastasis and was started on thyroxin supplementation.

Conclusion

This is a rare case of follicular carcinoma of the thyroid with metastasis in the skull base, presenting primarily with epistaxis and right lateral rectus palsy. This not only stresses on the possibility of thyroid carcinoma metastasis into the skull base but also to evaluate thyroid malignancies with cranial nerve palsies for possible skull base metastasis.

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