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CASE REPORT

A Rare Case of Metastasis to the Mandible from the Thyroid Gland: a Case Report and Literature Review

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Case Report

A 56-year-old female with multiple comorbidities presented with a swelling in the lower jaw (Figs. 1 and 2). On examination, it was a hard 6 × 5 cm swelling in the right mandible, 3 cm from the symphyses and posteriorly involving the angle of the mandible. The oral cavity did not show any evidence of disease. Also, a 3 × 2 cm nodule in the right lobe and 1 × 1 cm nodule in the left lobe of the thyroid were palpated without cervical lymphadenopathy. Laryngoscopy revealed both the cords to be mobile. Fine-needle aspiration cytology revealed a Bethedsa 1, i.e., few follicular cells. A trucut biopsy was undertaken from the mandibular swelling, which revealed a metastatic lesion from the thyroid which was positive for thyroglobulin and CKT. A bone scan of Tc-99 was done as part of the metastatic evaluation and showed an increased uptake in the right body of the mandible. Contrast-enhanced CT neck showed a 2.8 × 2.9 × 1.6 calcific nodule in the right lobe of the thyroid, a 1.2 × 1 cm hypointense nodule in the left lobe of the thyroid, and a 4 × 3 cm contrast-enhanced osteolytic lesion in the right body of the mandible Fig. 3. The patient was counseled regarding the need for surgery and consent was obtained for the same. A total thyroidectomy with hemimandibulectomy and adjacent level 1 B node clearance was done Figs. 4 and 5. Postoperative period was uneventful and she was discharged on postoperative day 4. Histopathological examination proved it as a pT3NoM1 follicular variant of papillary carcinoma of the thyroid, hence staged as IVB. American Thyroid Association (ATA) risk of recurrence is High Risk to which she received 100 mCi. Her follow-up thyroglobulin, antithyroglobulin, and low-dose scan were within normal limits. Hence, she can be categorized as Excellent response as per the Dynamic Risk Stratification. She is to be maintained on a suppressive dose of thyroxine (latest value of TSH—1.1 ng/dl). She is on regular follow-up, and 1 year since the surgery, there are no signs of recurrence.

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Introduction

Discussion

Metastasis to the mandible constitutes 1% of all mandibular malignancies with the primary focus being anywhere [1] and the most common sites being the body of the mandible [2], followed by the ramus and the condyle [3]. Histologically, the primary foci are usually carcinomas, and among them, adenocarcinomas are more common. Adenocarcinomas are usually a metastasis from the breasts in women or from the lungs, alimentary canal, or prostate in men [4]. Metastases to the jaw bones almost originate from infraclavicular regions. The diffusion through Batson's venous system is the principal process of metastasis [5]. Metastases to the mandible usually indicate a poor prognosis [6], but well-differentiated thyroid tumors deserve special attention, because papillary thyroid carcinoma (PTC) with bone metastasis has a relatively indolent biological behavior with a 5- and 10-year survival rate of 79.4% and 52.9% respectively [7].

The reason for bone marrow being an attractive site for metastasis is because it contains growth factors, which promote tumor cell proliferation and survival. Also, the vascular spaces are sinusoidal in nature, which are easy for cancer cells to penetrate and proliferate [8]. Bone metastases from thyroid carcinoma are mostly osteolytic [9]. Swelling, pain, and numbness were the most common clinical features. The most common symptoms of jaw metastasis are anesthesia and paresthesia over the chin, lower lip, and submental area due to the

Figs. 1 and 2 Preoperative clinical photographs of the right mandibular swelling

involvement of the mental nerve lying in the mental canal, which is called numb chin syndrome or mental nerve neuropathy [10]. A radiolucent destructive lesion with ill-defined irregular margins was the most common radiographic feature [4]. Three main criteria have been suggested to diagnose a lesion as metastatic [1]: (a) the histopathological verification of the primary tumor, (b) the unification of the histological

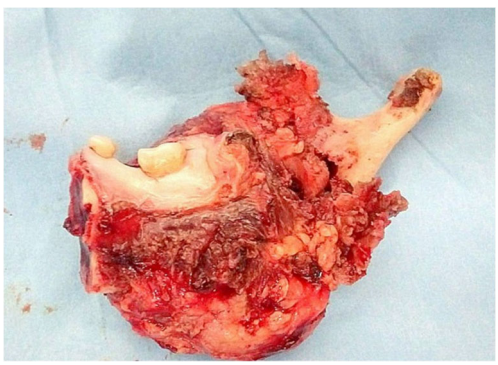

Fig. 3 Right hemimandibulectomy specimen with the metastatic lesion along with Level IB dissection

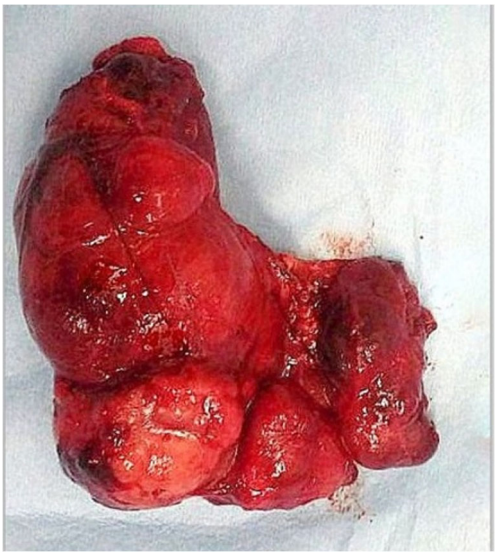

Fig. 4 Total thyroidectomy specimen of the enlarged right lobe

type of the metastatic tumor and primary tumor, c) the exclusion of the possibility of direct local spread from the primary tumor.

Papillary thyroid carcinoma (PTC) is the most common cancer occurring within the thyroid gland, accounting for about 80–90% of thyroid cancers. The most common sites of metastases are the lung and bone. These carcinomas usually remain intraglandular or may metastasize regionally to cervical nodes [11].

As compared to follicular carcinomas which have an incidence of skeletal metastasis of 7–28%, PTC account for < 7% of skeletal metastasis [12, 13]. The spine is the most common site of bony metastasis from a differentiated thyroid cancer and mandibular involvement is further a rare event [14]. It is also possible that some cases diagnosed as follicular thyroid carcinomas actually represented follicular variants of papillary thyroid carcinoma. In fact, the follicular to papillary metastatic jaw carcinoma ratio prior to 1988 was 4:1 and subsequently

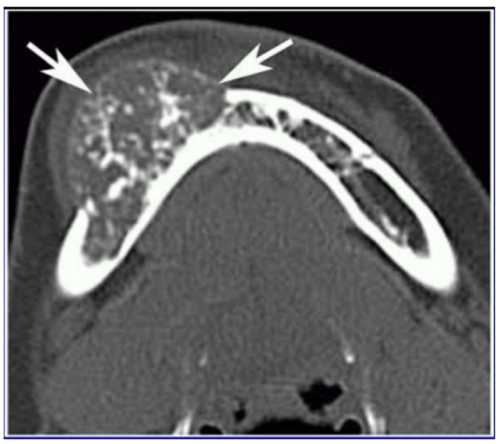

Fig 5 Osteolytic lesion in the body of the mandible

1.125:1. In addition, one half of papillary carcinomas metastatic to the jaws were of the follicular variant [15].

A literature search on Pubmed and Google scholar revealed a total of 17 reported cases of papillary carcinoma of the thyroid with mandibular metastasis and most of them are follicular variants with only 7 being true papillary carcinoma of the thyroid (PTC) [15, 16, 17, 18]. Hence, this would be the 11th case report so far for a papillary carcinoma thyroid metastasizing to the mandible.

The pathogenesis of well-differentiated thyroid cancers and its spread to bone has yet to be fully elucidated and the individual prognosis depends upon age at diagnosis of metastasis, tumor burden, and the number of bony metastases [19]. A great majority of the appendicular skeletal metastasis from thyroid cancers can be effectively managed by external beam radiation therapy or radioactive iodine ablations. However, some of the bony metastasis require surgical intervention due to the associated symptoms and fracture risk [20, 21, 22]. Surgical intervention is usually recommended for isolated, solitary, and accessible metastases and has a better prognosis as compared to nonsurgical management [23]. Also, as per the recommendations of ATA Guidelines (2015) for the management of solitary metastasis in well-differentiated thyroid cancers, the first option should be surgical metastectomy if feasible, followed by radioiodine ablation for iodine avid lesions, and external beam radiation for non-avid lesions. In patients with multiple site involvement, the role of metastectomy is less well understood. There have been reports that have shown that the removal of up to five bony metastases can be associated with improved survival and quality of life [23].

Reconstructive options after a metastectomy for a mandibular lesion include composite vascularized flaps, recon plates, and bone grafting. The free fibula flap continues to remain the "gold standard" and best option for mandibular reconstruction. Bone defects of up to 6 cm can be reconstructed with plating, but the angle of the mandible was also involved, thus warranting a hemimandibulectomy. Another option available and which has been described in the literature is costochondral rib grafting [16].

Conclusion

Dentists, as well as general physicians, should take into consideration the possible presence of jaw metastases in cases that present with atypical symptoms in patients with known malignant disease. Histopathological diagnosis of the origin of primary tumor has a crucial role in the management of the metastatic lesion, especially in cases of undiscovered primary malignancy. Surgical resection of the metastasis from differentiated thyroid cancers should be considered whenever it is solitary and feasible.

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