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Case Report of Papillary Thyroid Cancer with Clavicular Metastasis: Unusual Localization!

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Abstract **Case Report**

Follicular thyroid carcinomas have a greater propensity for distal metastasis than papillary and anaplastic thyroid carcinomas. Metastases are most observed in the lungs, followed by the bones. The most common skeletal sites of metastases are the humerus, pelvis, radius, and scapula. In this article, we present an unusual case of a 66-year-old, presented with papillary carcinoma thyroid with clavicle metastasis. Bone metastases have the potential to severely impact the quality of life by causing pain, fractures and spinal cord compression. Due to the lack of cases of patients with distant metastasis reported in the literature, there are still no definitive guidelines to treat these patients. We suggest and encourage the collection of more data on such patients in order to understand the natural history of the disease process and, consequently, in order to be able to formulate guidelines aiming to help clinicians make the right choice when treating patients with distant thyroid metastasis.

Key words: Papillary carcinoma- Thyroid carcinoma- Metastasis- Clavicular.

INTRODUCTION

Papillary thyroid carcinoma (PTC) remains the most prevalent form of thyroid malignancy. It represents more than 70% to 90% of thyroid tumors. And it is usually associated with a good prognosis, sinceit is a slowly progressive cancer, it is generally confined to the neck with or without spread to regional lymph node, with high survival rate [10].

Patients with differentiated thyroid carcinoma (DTC) have a 10-year survival rate of 80–95%. Distant metastases have only been observed in only 1% to 15% of patients with PTC, end when are present, the overall 10-year survival rate is 40%. The prognosis generally depends on age, tumor burden, and the number of bony metastases at diagnosis [4, 8].

Metastases are most observed in the lungs, followed by the bones, the most common skeletal sites of metastases are the humerus, pelvis, radius, and scapula [1]. In this article, we report the case of a patient who presented a PTC with clavicular metastasis which remains a rare localization.

CASE REPORT

A 66-year-old patient, with a 10-year history of type 2 diabetes on metformin and an acute coronary syndrome 3 years ago. 10 years ago, the patient presented a progressive cervical mass, for which he benefited from a total thyroidectomy and bilateral central compartment selective neck dissections.

The anatomo-pathological study of the surgical piece revealed a papillary thyroid carcinoma of both thyroid lobes, with extension to the adjacent conjunctivo-muscular tissue, perineural sheathing, without vascular emboli. The tumor foci measure 5cm and 2.5cm of long axis.

The postoperative cervical ultrasound examination showed a residue of 2cm treated by 131-Iodine therapy. The patient was put on L-thyroxine-based hormonal braking treatment.

In the follow-up, a local recurrence was diagnosed, treated by a 2nd dose of 131-Iodine therapy. Cervical lymph node metastases were found one year ago, treated by lymph node dissection.

For 7 Months, the patient presents with a painful and progressive masse of the right clavicle, without signs of compression, with alteration of general condition.

Clinical examination revealed a 2 cm nodule in the right thyroid lodge with a 10 cm right supraclavicular mass, painful, firm and mobile.

The laboratory tests showed a high thyroglobulin level (1844ng/ml), anti-thyroglobulin antibody negative. The cervical CT scan showed a tumoral process at the right thyroid, measuring 21*17mm, it arrives in contact with the right jugulo-carotid vascular axis and the trachea without endoluminal bud, with an invasive mass of the two thirds of the right clavicle, heterogeneous, with zones of necrosis, responsible for a bone lysis of the clavicle, end pulmonary nodules, measuring 11*8.7mm/11.6*8.5mm, with lytic lesions in the sphenoidal bone, the left zygomatic bone and the 3rd left rib, in favor of metastases.

The patient has undergone a surgical removal of the recurrence in thyroid lodge, and a complete removal of the clavicular metastasis with osteosynthesis. The patient was put on L-thyroxine-based hormonal braking treatment, end he was referred to medical oncology for a systemic therapy.

DISCUSSION

Approximately 90% of malignant thyroid tumors well differentiated and are classified as PTC (80%) or follicular carcinoma (10%) [6]**.** The PTC is mainly transferred to the local lymph nodes through lymphatic drainage, and distant metastasis is very rare. The presence of distant metastasis indicates a poor prognosis. In such cases, the 10-year survival rateis only around 40%. Cervical lymph nodes are the most prone to metastasis in PTC, and 23% to 56% of patients with PTC have clinically significant lymph node metastasis, while in cervical lymph node prophylactic dissection, in up to 90% of cases the histologic results reveal lymph nodes metastasis. Lymph node metastasis is also a risk factor for high recurrence of the disease. In the present case, cervical lymph node metastasis was observed [1].

Bone metastases are commonly attributed to primary tumors arising from the prostate, breast, lung and kidney. Bone has been reported to be the second most common site of distant metastasis among patients with well differentiated thyroid cancers and its incidence ranges from 1 % to more than 40 % [5]. Follicular carcinomas show a greater propensityfor distal metastasis (7–28 %) than papillary (1.4–7 %) and anaplastic thyroid carcinomas. Patient with bone metastasis from thyroid cancers generally have better survival than some other primary carcinomas that more frequently metastasize to bone [5].

Numerous factors contribute to the development of bone metastases. Increased blood flow in bone marrow serves as a powerful mechanism to favor the hematogenous spread of tumor cells. Malignant cells are also known to secrete angiogenesis compounds, which enhancebone resorption, creating an optimal environment for tumors to grow and develop [7, 8].

The thyroid carcinoma is known as an osteolytic tumor. It can enhance the production of IL-1, IL-6, and receptor activator of nuclear factor-kB ligand (RANK-L), which ultimately leads to there sorptive activity of the bone and secondary bone formation as a response.

Furthermore, adhesive molecules synthesized by tumor cells allow them to attach to the bone matrix easily. Typically, cancer cells that exchange biological information with bone environments can establish bone metastases [12].

For this, the “seed and soil” hypothesis is widely accepted. Circulating cancer cells (seeds) have a propensity to metastasize to organs with the microenvironment (soil) advantageous for their growth. The ability of cells to survive, multiply, and recruit a blood supply gives rise to metastases. Bone is a large repository for immobilized growth factors, including transforming growth factors, insulin-like growth factors -I and II (IGF-I and II), fibroblast growth factors, platelet derived growth factors, bone morphogenetic proteins, and calcium. Released and activated during

bone resorption, these factors render the bone fertile for tumor growth [1, 7].

More than 80% of bone metastases from all tumors, including DTC, are in axial skeleton red marrow where blood flow is high (vertebrae, ribs, and hips).

Moreover, with respect to metastatic bone lesions, our case is unique, in that it shows bone metastasis noted to the clavicle [1, 7].

The clavicle forms the anterior portion of the shoulder girdle and is considered to be embryologically unique as it is the first bone in the human body to ossify. However, from the oncological standpoint, the clavicle is a rare primary site for malignancy, metastatic involvement of the clavicle is even rarer (0–15 %) [1, 11].To this end, our case depicts a unique presentation papillary thyroid cancer with clavicle metastasis, which typically has a very low propensity for bone metastasis.

Most presentations of clavicular lesions are reported in small case studies with a broad spectrum of presentations. Regarding the lesion location, the medial third of the clavicular is the most commonly affected location in the clavicular bone, with 60% of the lesions localized to this area. In our case, the lesion affects the lateral two-thirds of the clavicle, which remains more particular localization [9].

Previous studies have investigated the various prognostic factors in patients with bone metastases from thyroid cancer, .these factors, including age (greater than 45 years), poor differentiation, follicular thyroid carcinoma, and Hurthlecell variant, as well as extra-pulmonary metastasis, have generally been associated with poorer cancer-specific survival[1].

A great majority of the 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. Surgical intervention is usually recommended for isolated, solitary and accessible metastases [8]. In patients with multiple site involvement, the role of metastectomy is less well understood. There have been reports that have shown that removal of up to five bony metastases can be associated with improved survival and quality of life. Apart from the above rationale surgical resection of the clavicular metastasis was considered in our patient because of the associated pain and accessibility [2, 5, 7].

If not surgically excised, bone metastases of differentiated thyroid carcinoma are difficult to manage as they respond poorly to radioiodine therapy. Inoperable bony secondaries especially if painful may to a reasonable extent be ameliorated by external radiotherapy. The reduction in tumor load by surgical removal of the large bone metastases in the index patient immensely helped better ablation of the pulmonary metastases with radioiodine [3].

Management of these patients must involve a multidisciplinary approach consisting of medical treatment (analgesia and bisphosphonates), radiotherapy, surgery, and radioisotopes.

CONCLUSION

Bone metastases from differentiated thyroid cancer is rare, especially clavicular metastasis arising from PTC. Various factors can affect prognosis and long-term outcomes.

We describe a case of PTC with neck mass involving the clavicle. While bone metastases from differentiated thyroid cancer are rare, the clavicular spread becomes an even more unique finding arising from PTC. while the prospect of recovery is generally favorable, clinicians should be mindful of the various essential factors that determine prognosis in these cases.

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