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Case Report

ARCHIVES OF CLINICAL AND MEDICAL CASE REPORTS

ISSN: 2575-9655

An Unusual Metastatic Site of a Papillary Thyroid Carcinoma: A Case Report

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Abstract

Metastasis to distant sites in cases of differentiated thyroid cancer is uncommon, with the lungs and bones being the most commonly affected areas. Soft tissue metastases are exceedingly rare. Here, we present an uncommon case of soft tissue metastasis of papillary thyroid cancer to skeletal muscle. This case emphasizes that papillary thyroid carcinoma, while typically following an indolent course, can result in distant metastases to unusual locations.

Keywords: Thyroid; Papillary Carcinoma; Soft Tissue; Metastasis; Histopathology

Introduction

Papillary thyroid cancer (PTC) is the most prevalent malignancy affecting the thyroid gland, and typically spreads through lymphatic extension. The occurrence of regional metastasis to the neck is notably high, while metastases beyond the deep cervical chain are rare [1]. The occurrence of distant metastases is rare in patients with differentiated thyroid cancer (DTC), with the histological type of follicular carcinoma being more commonly associated than the histological type of papillary carcinoma. These metastases are typically observed in the lung and bone, with less frequent occurrence in the brain or liver, while metastases at other sites are rare [2]. Herein, we present an unusual case of metastatic papillary thyroid cancer to the gluteal muscle.

Case Presentation

We present the case of an 82-year-old patient who underwent total thyroidectomy seven years ago for an encapsulated follicular variant of papillary thyroid carcinoma. The patient presented with a left hip mass that had been developing for one year. Pelvic MRI revealed a left sacroiliac mass measuring 17 cm in the long axis, affecting the small and medium gluteal muscles; the mass was approximately oval in shape, well- defined, and heterogeneous with an intermediate T1 signal and T2 hypersignal. It extends to the iliac wing and contacts the femoral head without signs of invasion.

An ultrasound-guided biopsy was performed, and the sample was sent to our facility for histopathological examination. Histological analysis revealed a tumoral proliferation of essentially vesicular architecture composed of vesicles of variable size bordered by voluminous, overlapping, grooved thyreocytes with dense chromatin.

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Citation: Maryam Cheddadi, Samia Sassi, Ismail Boujida, Omar Ibelkouchene, Sabrine Derqaoui, Siham Mesmoudi, Ahmed Jahid, Fouad Zouaidia, Zakia Bernoussi, Kaoutar Znati. An Unusual Metastatic Site of a Papillary Thyroid Carcinoma: A Case Report. Archives of Clinical and Medical Case Reports. 8 (2024): 136-138.

Received: May 22, 2024
Accepted: June 04, 2024
Published: June 26, 2024

Cheddadi M, et al., Arch Clin Med Case Rep 2024
DOI:10.26502/acmcr.96550675

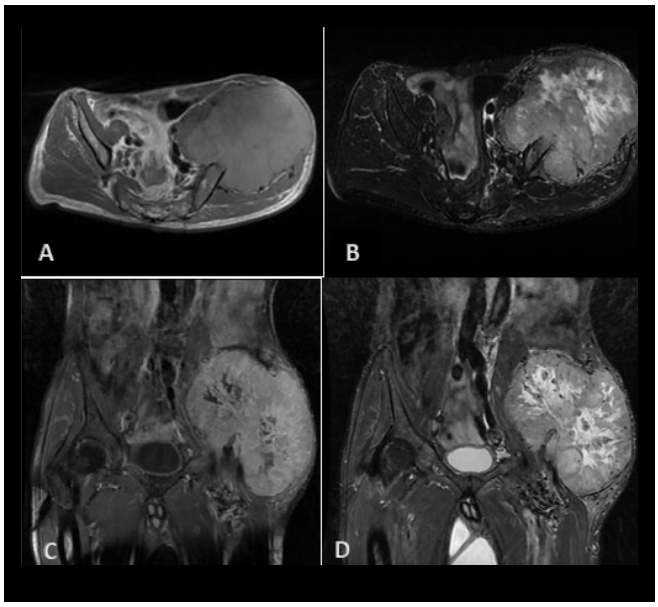

Figure 1: Pelvic MRI in axial T1 (A), axial T2 (B), coronal T1 FS (C), axial T2 (D) slices showing a left sacroiliac mass affecting the small and medium gluteal muscles, approximately oval in shape, well-defined, heterogeneous with intermediate T1 signal and T2 hypersignal. It extends to the iliac wing and contacts the femoral head without signs of invasion.

Immunohistochemistry demonstrated positivity for thyroglobulin and TTF-1 (thyroid transcription factor) and negativity for synaptophysin and chromogranin.

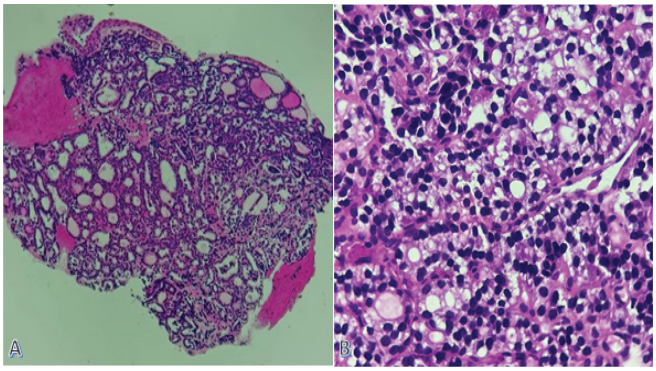

Figure 2: Microscopic examination of the specimen. H&E. A: Low magnification showing microscopic features of a tumoral proliferation of essentially vesicular architecture composed of vesicles of variable size(x10). B: At high magnification, the vesicles are composed of voluminous, overlapping, grooved thyreocytes with dense chromatin (x40).

Considering the patient's history, morphological appearance, and immunohistochemical findings, the diagnosis of metastatic thyroid carcinoma with follicular architecture was confirmed.

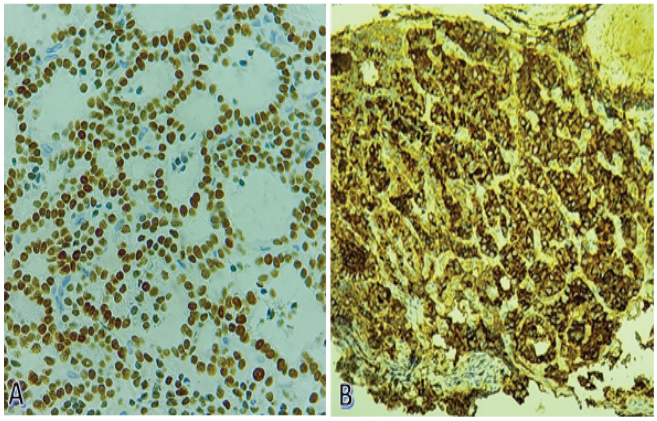

Figure 3: Immunohistochemistry showing: TTF1 (Thyroid transcription factor) (A) and Thyroglobulin (B) positivity.

Discussion

Based on histological patterns, thyroid cancers are categorized as differentiated carcinomas, which include papillary and follicular carcinomas, as well as undifferentiated anaplastic carcinomas. Medullary carcinoma refers to thyroid cancer originating from parafollicular cells [3]. Papillary carcinoma represents the most prevalent subtype, accounting for 80–85% of all thyroid malignancies. Papillary thyroid carcinomas are frequently identified between the ages of 30 and 50 and are more prevalent in women, with rates 2 to 4 times greater than those in men [4]. Macroscopically, these cancers exhibit variability in size (average 2.5 cm) and typically present as firm, white masses with calcification. Microscopically, papillary thyroid carcinomas are distinguished by enlarged clear nuclei containing hypodense chromatin, which gives them a ground glass appearance [5]. Follicular variant of papillary thyroid carcinoma is characterized by a follicular architectural pattern, while retaining nuclear features typical of a papillary carcinoma [6]. In our case, we did not observe the classic nuclear morphology of papillary thyroid carcinoma. This finding could resemble lymph node metastases from papillary carcinoma, where certain cases exhibit only a follicular growth pattern and positive staining for thyroglobulin, lacking the typical nuclear features of PTC [7]. It is important to mention that the fifth edition of the World Health Organization classification identifies invasive encapsulated follicular variant of papillary thyroid carcinoma (IEFVPTC) as a separate entity that is no longer classified as a subtype of PTC. IEFVPTCs have a fibrous capsule or well-defined border and lack the histologic features of infiltrative follicular PTC. Like follicular thyroid carcinomas (FTC), IEFVPTC can invade vessels in the capsule and cause distant metastasis [8].

Approximately 10% of patients diagnosed with papillary thyroid carcinoma, and 20% to 40% of those with the follicular subtype succumb to complications related to their

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local disease and distant metastases. The reported occurrence rates of distant metastases in differentiated thyroid cancer range from 6% to 20%, with variations observed between the papillary and follicular subtypes [9]. In DTC, metastatic disease typically follows a more favorable trajectory than other malignancies with widespread dissemination, often resulting in 10-year survival rates of 50% across most series. The lungs and bones are the sites most commonly affected by distant metastases in DTC patients. While metastases can also occur in the brain, liver, skin, pleura, and muscle, they are less frequent [10]. Previous case reports have described solitary, symptomatic skeletal muscle metastases to the biceps, trapezius, and vastus medialis muscles [1]. Here, we present a case of soft tissue metastasis from papillary thyroid cancer to the skeletal muscle of the gluteal region. Metastases to atypical locations, such as soft tissues, typically indicate dedifferentiation and often emerge years after the initial presentation [10]. In this case, the patient presented with a mass in the hip area 7 years after a thyroidectomy. When identifying soft tissue masses, it is crucial to determine their histology, as primary cancers originating from the lung, kidney, and colon are frequently reported as the most common sources of soft tissue metastases [11]. Immunohistochemical staining with a panel of antibodies against thyroglobulin and TTF-1 confirmed the thyroidal origin of the neoplasm [12].

Conclusion

This report highlights an unusual case of metastatic papillary thyroid carcinoma extending to the soft tissues of the gluteal region in the presence of recurrent disease. The practical interest of this observation lies in the fact that, although differentiated thyroid carcinoma is usually clinically indolent, it can sometimes develop distant metastases and even present as a metastatic tumor.

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