

Periacetabular bone metastasis in follicular variant papillary thyroid carcinoma: a case report

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Abstract

Bone metastasis from papillary thyroid carcinoma (PTC) is uncommon, and periacetabular involvement is particularly rare. Metastatic lesions located in the pelvis may cause pain, functional impairment, and mechanical instability. This case report presents the surgical management of a periacetabular bone metastasis arising from the follicular variant of papillary thyroid carcinoma. A 60-year-old man presented with progressive left hip pain. He had undergone total thyroidectomy for papillary thyroid carcinoma two months earlier. Radiological evaluation demonstrated a large expansile lytic lesion in the anterior acetabular region extending to the superior pubic ramus. Following multidisciplinary evaluation, the lesion was completely excised through an anterior Stoppa approach. The resulting bone defect was reconstructed using a free tricortical iliac autograft together with plate-and-screw fixation. Histopathological examination confirmed bone metastasis of the follicular variant of papillary thyroid carcinoma. At the one year follow-up, graft union had been achieved, and the patient was able to walk without assistance with satisfactory hip function. Periacetabular metastasis of follicular variant papillary thyroid carcinoma is rare and may significantly compromise functional status. In selected patients, surgical excision and reconstruction may provide effective local tumor control, pain relief, and restoration of pelvic stability.

Keywords: Papillary thyroid carcinoma; follicular variant; bone metastasis; periacetabular metastasis; pelvic reconstruction; Stoppa approach

Introduction

Bone is one of the most common sites of distant metastasis from solid tumors [1, 2]. A substantial proportion of patients with solid malignancies develop painful skeletal metastases during the course of their disease, most often involving the spine, pelvis, and extremities [1, 2]. The tumors that most frequently metastasize to

bone are those of the prostate, breast, kidney, thyroid, and lung [1, 2]. Thyroid carcinomas are classified according to their degree of cellular differentiation into well-differentiated and undifferentiated (anaplastic) carcinomas, and these groups differ considerably in their morphological and biological behavior. The well-differentiated tumors comprise papillary and follicular carcinomas, whereas poorly differentiated (insular) and





Figure 1. Anteroposterior pelvic radiograph showing a lytic lesion in the left acetabulum.

anaplastic carcinomas fall outside this group. Papillary and follicular carcinomas generally follow an indolent clinical course and are amenable to treatment, whereas anaplastic carcinoma exhibits highly aggressive behavior [3].

Papillary thyroid carcinoma (PTC) is the most common thyroid malignancy and usually follows a slowly progressive clinical course. Five-year relative survival rates of up to 97.5% have been reported, and only a small subgroup of patients exhibits aggressive clinical behavior. However, bone metastases occur in 2–13% of patients with PTC and significantly worsen the prognosis [4]. Five- and ten-year survival rates in patients with bone metastases have been reported to range between 42–61% and 20–27%, respectively [5]. Male sex, advanced age, a high metastatic burden, multiple bone metastases, the presence of accompanying distant metastases, late recognition of skeletal metastasis, the occurrence of skeletal-related events (SREs), and the failure of metastatic foci to concentrate radioactive iodine (I-131) are among the unfavorable prognostic factors [6].

Tall cell, columnar cell, and diffuse sclerosing variants of papillary thyroid carcinoma are defined as aggressive subtypes. These variants have been associated with greater extrathyroidal spread, a higher incidence of lymph node and distant metastases, increased recurrence rates, and greater resistance to radioactive iodine therapy [7, 8]. The follicular variant of papillary thyroid carcinoma presenting with pelvic bone metastasis is a rarely reported condition; in this report, its surgical management is discussed in light of the literature.

Case report

A 60-year-old man presented to our clinic with left hip pain that had persisted for approximately a few months. He had undergone total thyroidectomy two months earlier (March 2024) for papillary thyroid carcinoma and had been under regular follow-up. Because imaging during follow-up raised suspicion of bone metastasis, he was referred to our clinic for assessment and for excision of the mass prior to definitive treatment planning.

An anteroposterior pelvic radiograph obtained at presentation revealed a lytic lesion in the anterior part of the left acetabulum (Figure 1). Pelvic computed tomography (CT) demonstrated a well-circumscribed, expansile lytic lesion measuring approximately 80 × 50 × 55 mm in the anterior acetabulum and extending to the left superior pubic ramus, consistent with the tumor. An additional sclerotic lesion approximately 12 mm in diameter was identified in the right iliac bone, adjacent to the sacroiliac joint (Figure 2).

Magnetic resonance imaging (MRI) was performed for surgical planning. MRI revealed a solid mass lesion measuring approximately 49 × 61 × 82 mm involving the left iliac and pubic region. Periosteal and bone marrow edema were noted around the lesion, together with a mild perifascial fluid increase. On post-contrast T1-weighted sequences, the lesion showed enhancement consistent with a metastatic process (Figure 3). A faintly enhancing sclerotic lesion approximately 8 mm in diameter was again observed in the right iliac bone at the level of the sacroiliac joint. Given the typically indolent course of these tumors and the possibility of recurrence after many years, excision of the mass was planned with the aim of reducing the metastatic burden before radioactive iodine therapy. During preoperative evaluation, surgery was temporarily postponed because the thyroid function tests were elevated. Once thyroid function had normalized following medical treatment arranged by the Endocrinology Clinic, surgery was planned.

Surgery was performed through an anterior Stoppa approach. The mass in the anterior wall of the left acetabulum was reached and completely excised. The bone defect resulting from the resection was reconstructed with an 8 × 6 cm free tricortical autograft harvested from the iliac wing, and stabilization was achieved with plate-and-screw fixation. At 1 year postoperatively, graft union was achieved; the patient had a full range of hip motion with only mild pain and was able to walk without assistance (Figure 4). Immunohistochemical staining and histopathological examination of the intraoperative tissue samples revealed morphological findings consistent with bone metastasis of the follicular variant of papillary thyroid carcinoma.

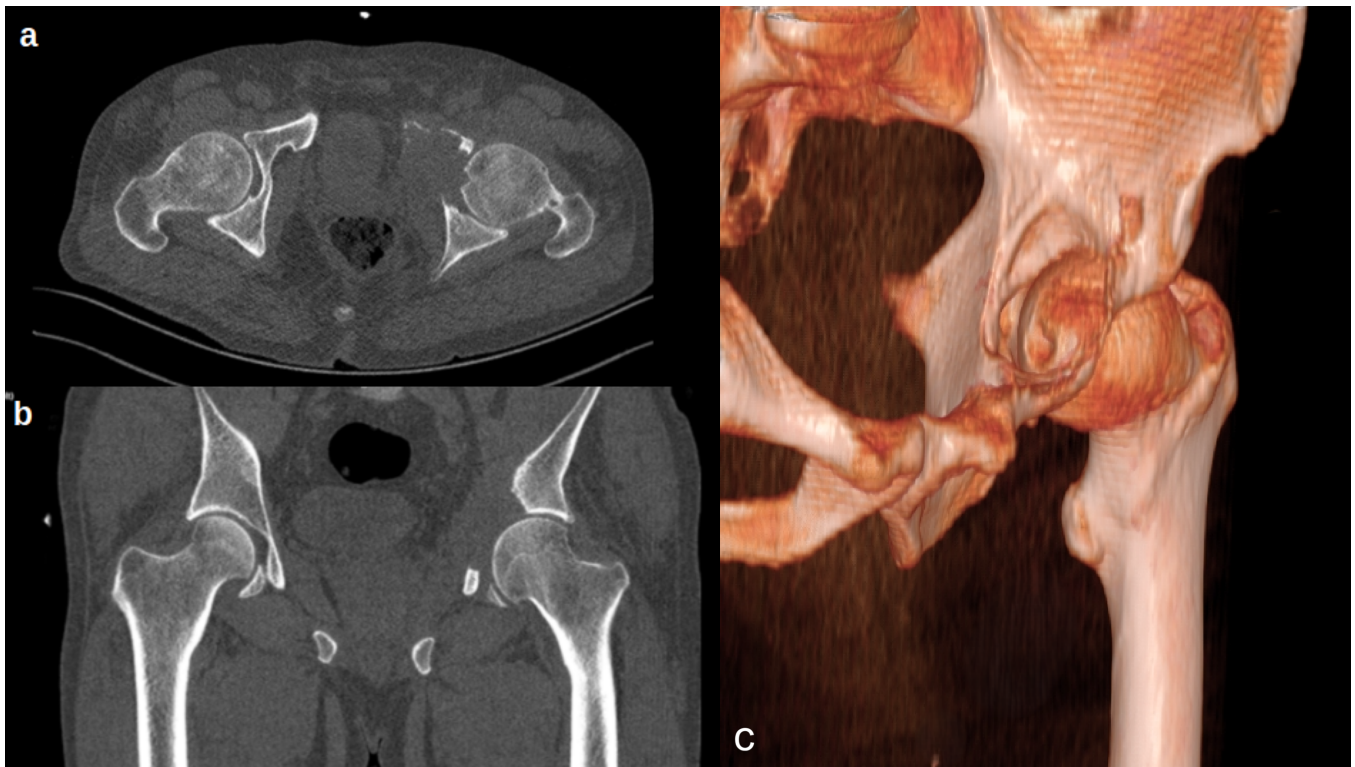


Figure 2. Axial (a), coronal (b), and 3D (c) computed tomography images of the patient showing a lytic lesion in the anterior column of the left acetabulum and the quadrilateral plate.

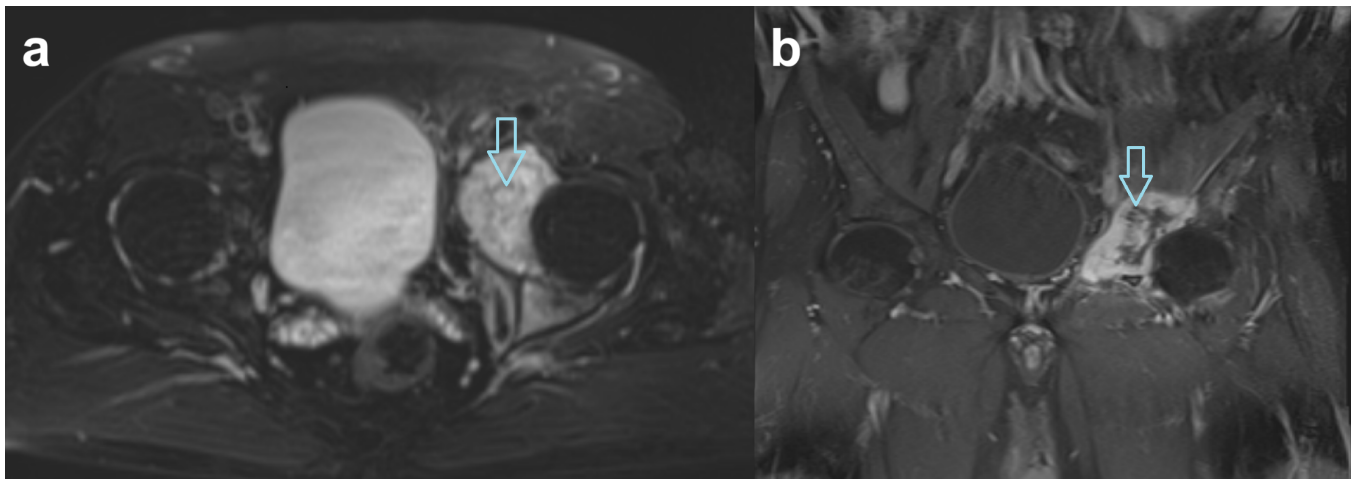


Figure 3. Axial (a) and coronal (b) post-contrast T1-weighted magnetic resonance images of the patient showing mass causing lysis in the left acetabulum (arrow).

Discussion

In our patient, the primary source of the bone metastasis was thyroid carcinoma. This is consistent with the report of Krishnan et al., in which the pelvis was one of the most common sites of metastatic bone involvement in thyroid cancer [9]. In the case series of pelvic bone metastases

from primary thyroid cancer reported by Prabowo et al., the patients were predominantly women; the present case, occurring in a man, therefore represents a rarer patient group than those reported in the literature [10]. Papillary thyroid carcinoma is the most common histological type of thyroid malignancy and is usually diagnosed between the third and fifth decades of life [9, 11]. Our patient was

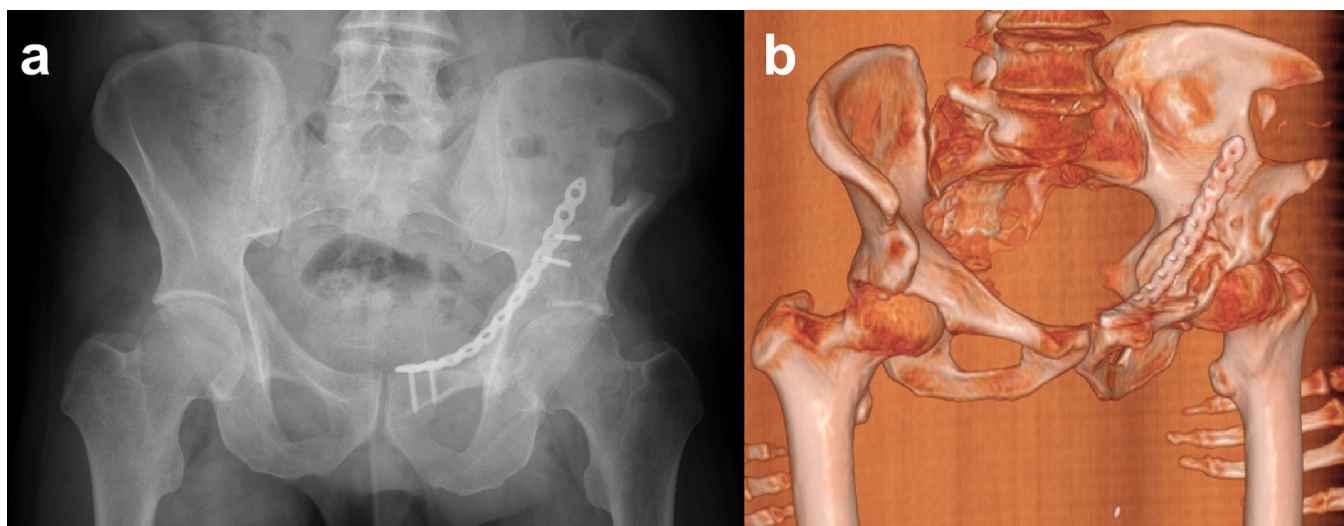


Figure 4. Postoperative one-year radiograph (a) and 3D computed tomography scan (b) following acetabular reconstruction with a bone graft harvested from the left iliac wing.

60 years old with a prior history of thyroidectomy, and the metastatic involvement—developing late in a long disease course—is consistent with the literature.

Metastatic bone disease in the pelvis is clinically critical, particularly in load-bearing structures, because of the regional anatomy. The periacetabular region and the iliac wing are among the most frequently involved pelvic sites, and lesions in these areas may cause severe pain, loss of function, and a risk of mechanical instability. In our patient, the metastatic lesion was located in the periacetabular region, in keeping with the distribution of pelvic metastases reported by Krishnan et al. [9].

The treatment of pelvic bone metastases requires a multidisciplinary approach involving orthopedic surgeons, medical oncologists, and radiation oncologists. The choice of treatment is determined by the patient's general condition, life expectancy, the location of the metastases, the extent of bone loss, and functional expectations. Conservative options—including analgesic therapy, systemic therapy, and radiotherapy—are aimed primarily at improving quality of life, especially in patients who are not suitable for surgery [12, 13]. However, these methods may be insufficient to provide mechanical stability for large, destructive metastases in load-bearing regions of the pelvis.

In selected patients, surgical treatment is an important option for local tumor control, pain reduction, and preservation of function. Pelvic reconstruction following surgical resection of metastases has been reported to yield better functional results and quality of life than conservative approaches [9, 10, 13]. In particular, surgical stabilization of periacetabular metastases has been shown to facilitate mobilization and to reduce the risk of pathological fracture.

In the present case, surgical treatment was preferred because of the periacetabular location of the lesion, the associated mechanical instability and recurrence risk, and the plan to reduce the metastatic burden before radioactive iodine therapy, despite the relatively small size of the lesion. The anterior Stoppa approach provided safe access to the lesion; the mass was completely excised, and the resulting bone defect was reconstructed with a tricortical autograft and plate-and-screw fixation. In addition to achieving local tumor control, this approach helped preserve acetabular stability and improved the functional outcome.

Conclusion

Pelvic bone metastases from primary thyroid cancer, although rare, may seriously affect patients' quality of life and functional status. Metastatic lesions located in the periacetabular region are clinically important because of the associated mechanical instability and the risk of pathological fracture. This case illustrates that, within a multidisciplinary framework and following medical treatment aimed at reducing tumor burden, pelvic bone metastases from thyroid cancer can be managed successfully with an appropriate surgical strategy, thereby contributing to the literature.

Author contributions

All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by SAA, AYS, ÖTŞ, İA, and SB. The first draft of the manuscript was written by SAA, AYS and ÖTŞ, and all authors commented on previous versions of

the manuscript. All authors read and approved the final manuscript.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical statement

The authors confirm that this case report was conducted in accordance with the ethical standards outlined in the 1964 Declaration of Helsinki and its later amendments. Written informed consent was obtained from the patient for the publication of this case report and the accompanying images.

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