CASE REPORT

Follicular thyroid carcinoma with uncommon metastasis to the scapula: a case report

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Pakistan Journal of Nuclear Medicine
Volume 14(2):81–86
DOI: 10.24911/PJNMed.175-1721048211

Pakistan Journal of Nuclear Medicine is the official journal of Pakistan Society of Nuclear Medicine

ABSTRACT

Background: Thyroid nodules are frequently encountered, with 5%-10% being malignant. Follicular thyroid carcinoma (FTC) is a differentiated thyroid malignancy, known for hematogenous spread to distant sites such as lungs, bones, and less commonly, soft tissues. We report a rare case of FTC with isolated metastasis to the scapula.

Case Description: A 55-year-old female initially presented with a thyroid mass. A diagnostic workup followed by FNAC revealed follicular neoplasm. The patient underwent a right lobectomy and then a total thyroidectomy. The patient was diagnosed with follicular carcinoma on biopsy and was given radioactive iodine (RAI) therapy. The patient was on regular yearly follow-up for 6 years and then lost to follow-up for 3 years due to the corona pandemic. Despite initial treatment and maintenance on levothyroxine, she presented nine years later with a painful, enlarging mass in her right shoulder. Imaging (X-ray, CT, and MRI) and ultrasound-guided core biopsy were performed to diagnose the lesion.

Results: Imaging revealed a large, infiltrative malignant lesion in the right scapula, causing extensive bone and muscle destruction. Biopsy confirmed metastatic FTC. The second therapeutic dose of 200 mCi of radio-iodine (I-131) was given. Post-therapy scan showed significant radioiodine uptake in the scapula, indicating active metastatic disease. The patient was then treated with monthly injections of Zometa for bone strengthening and continues to be monitored.

Conclusion: This case underscores the necessity for vigilant long-term follow-up in FTC patients due to the potential for late metastatic presentations. The multidisciplinary approach, involving imaging, pathology, and nuclear medicine, is crucial for accurate diagnosis and effective management of metastatic FTC. This case highlights the role of appropriate counseling of the patient regarding the need for long-term follow-ups, keeping in mind the possibility of distant metastasis late after the initial presentation.

Keywords: Follicular thyroid carcinoma, scapular metastasis, thyroglobulin, fine needle aspiration cytology (FNAC), thyroidectomy, case report.

Received: 15 July 2024 **Accepted:** 18 January 2025
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Introduction

Thyroid nodules are frequent, with 5%-10% of them being malignant. If a thyroid nodule is found during a neck ultrasonographic examination, additional testing using fine needle aspiration (FNA) and potentially surgery may be necessary, depending on the size and radiological characteristics standardized by the thyroid imaging reporting and data system [1]. Among endocrine cancers, thyroid carcinoma (TC) is the most prevalent [2]. More than 90% of thyroid tumors are differentiated thyroid malignancies, which are derived from thyroid follicular epithelial cells [3]. The most common type of thyroid cancer is papillary carcinomas, which account for 80% of thyroid malignancies, and the second most common is follicular carcinomas, which is 10% of total thyroid cancers. Hürthle cell carcinoma is a variant of follicular carcinoma and makes up 2%-3% of all thyroid malignancies. Among dedifferentiated thyroid cancers, MTCs account for 2%-3%; anaplastic carcinomas (1%-2%). Rest include primary thyroid lymphomas and primary thyroid sarcomas, which are rare [4]. It is uncommon for many forms of

thyroid cancer to coexist in one patient [3]. Following a complete thyroidectomy for thyroid cancer, the rate of distant metastases ranges from 7% to 23% [5]. Among differentiated thyroid cancers, follicular thyroid carcinoma (FTC) is more common in women and generally appears in the fifth and sixth decades of life [5 6]. It usually spreads via a hematogenous route to distant locations, mainly the lungs and bones, after invading blood vessels. It has been observed that 6%-20% of FTC patients experience distant metastases [7]. Lung, bone, and brain are the most prevalent locations for distant metastases of follicular thyroid cancer (FTC), accounting for 11%-25% of cases according to Wang et al. [8]. Farina et al. state that one of the uncommon manifestations of follicular cancer is subcutaneous metastases [9]. Although statistics from published

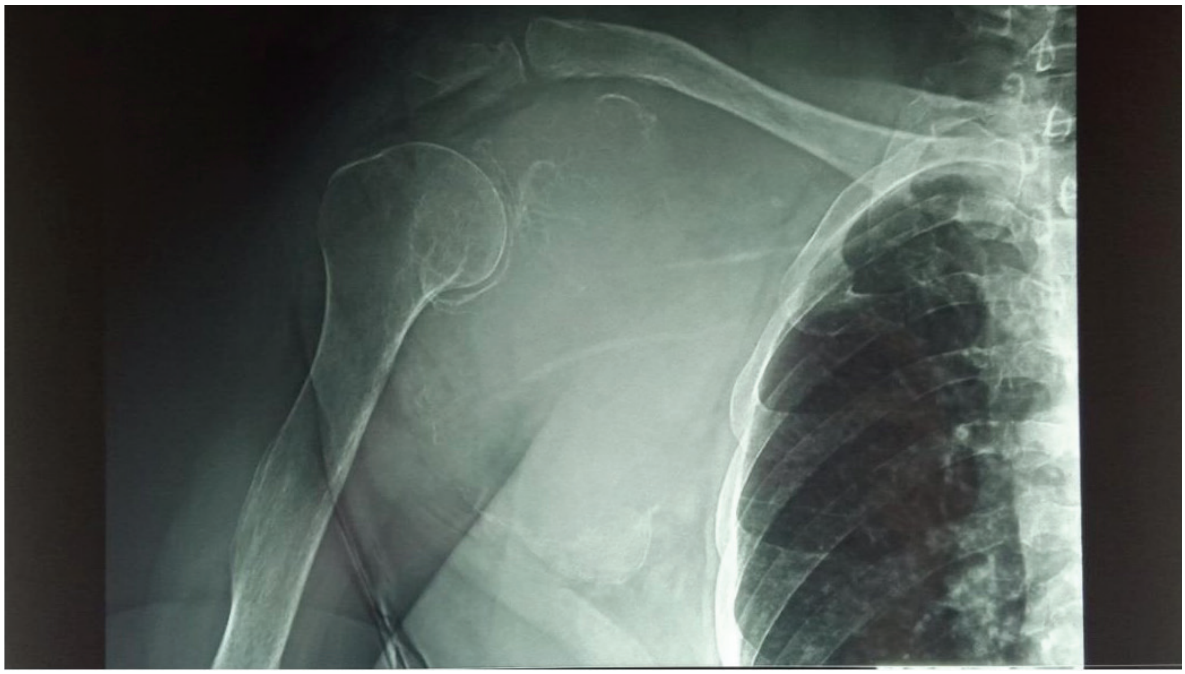

Figure 1. *X-ray showing large lytic lesion involving the right scapula.*

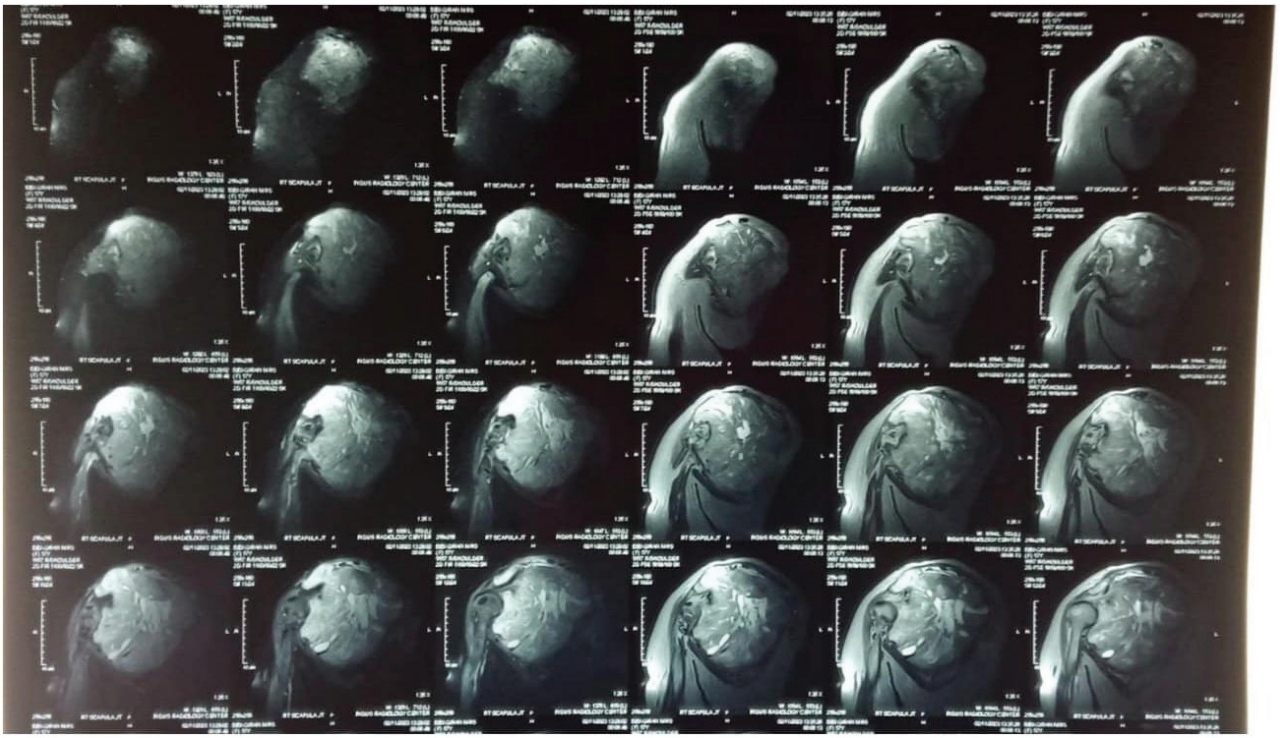

Figure 2. *MRI depicting infiltrative malignant lesion causing erosion and destruction of right scapula with infiltration of adjoining muscles.*

research vary greatly, it has been estimated that bone metastasis occurs in 7%-28% of follicular carcinomas and 1.4%-7% of papillary carcinomas [10].

Case Report

A 55-year-old female patient presented with thyroid mass. A diagnostic workup was done. There were no signs of retrosternal extension, tracheal shifting, or carotid compression. Regional lymph nodes were not palpable. The rest of the systemic examinations were normal. The cold nodule was seen in the right lobe of thyroid on thyroid scan. FNAC revealed follicular cells. The right lobectomy was done. Biopsy showed follicular carcinoma having lesion size of 7.5 × 6 × 4.2 cm with capsular invasion and lympho-vascular invasion. The tumor was less than 0.1 cm from the outer painted surface. Patients were sent to a surgeon for completion thyroidectomy. Post-surgery, initial treatment was with thyrogen-stimulated radioactive iodine (RAI) therapy as the TSH was 11.2 µU/ml at that time. Afterward, the TFT reports were FT4: 12.9 (11-23 pmol/l), TSH: 33.6 (0.30-5.00 µU/ml), thyroglobulin: 2048 (mg/dl), and anti-thyroglobulin antibody: 98 (IU/ml); 150 mCi of radioactive iodine therapy (RIT) was given. The ^{131}I whole-body scan was later performed and showed no uptake in the thyroid bed region and no abnormal uptake in the rest of the body. The patient was treated with L-thyroxine replacement. She was maintained on levothyroxine 50 mcg, 21 tabs per week with a goal of a suppressed TSH. During the follow-up period, Tg and Anti-Tg were checked and were within normal limit. The Tg level in the last follow-up was 15 ng/ml and the Anti-Tg level was 0.9 IU/ml in the subsequent 6 years. Routine blood tests and thyroid function tests were within the normal limit. No recurrence was observed during 6 years of follow-up. Then, the patient was lost to follow-up due to corona pandemic.

After 9 years of initial presentation, she presented with complaints of pain and swelling in the right shoulder. The patient complained that the swelling was gradually increasing in size, causing pain and distress. On physical examination, a huge tender mass was seen in the right shoulder disrupting its mobility. Imaging examinations were conducted for the right shoulder of the patient. X-ray, MRI, and CT demonstrated a huge soft tissue mass involving the right scapula, as shown in Figures 1-3, respectively.

Additionally, multiple discrete soft tissue density nodules were identified in intraparenchymal and subpleural locations involving bilateral lungs, the largest one in the inferior lingular segment measured 1.2 × 1.0 cm. These likely represented metastatic deposits (Figure 4).

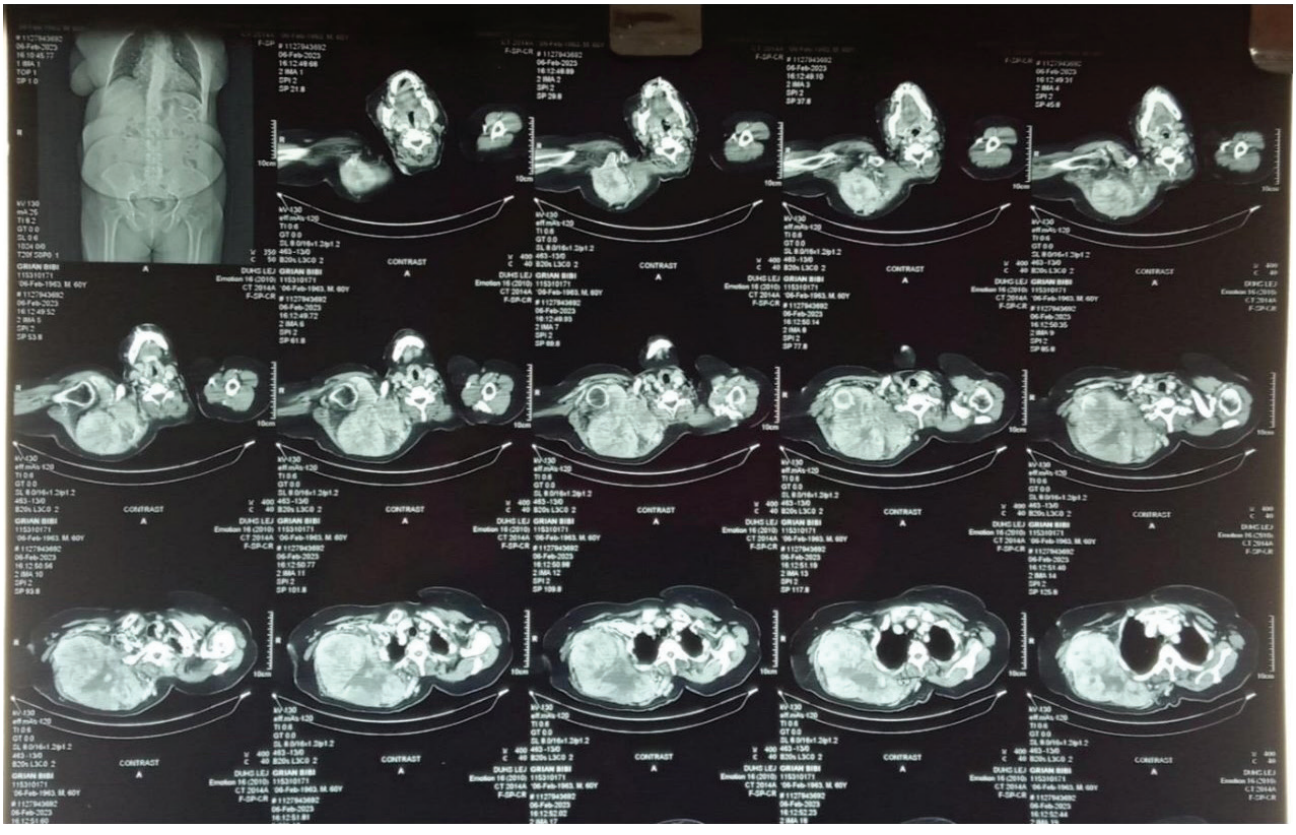

Figure 3. *CT scan showing heterogeneously enhancing mass lesion in the right scapular region destroying the glenoid cavity along with the involvement of various muscles.*

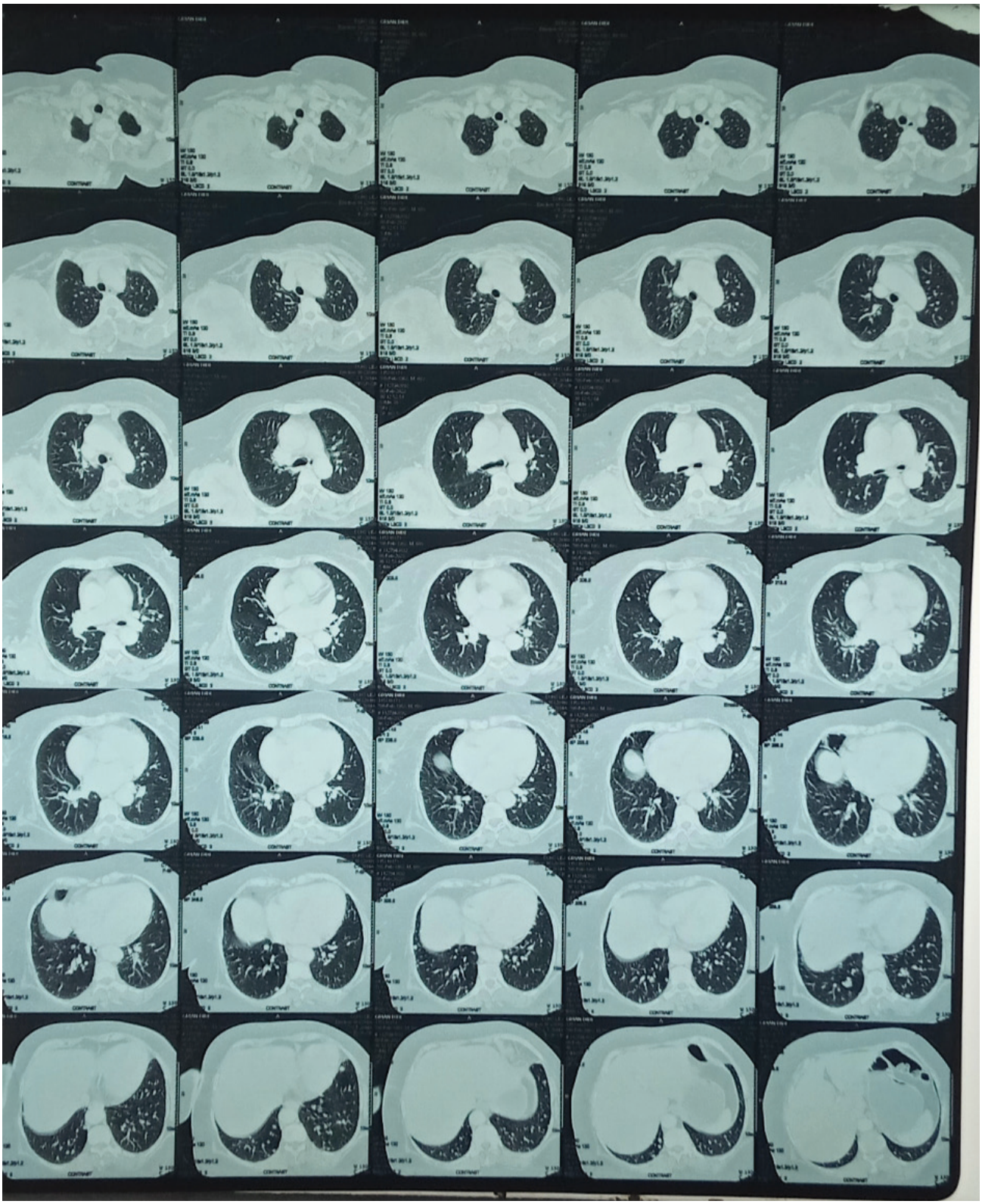

Figure 4. *CT lung window showing small nodules representing metastasis.*

Surgical excision was advised, which was not possible due to its invasion of surrounding structures. The serum thyroglobulin (Tg) before the ^{131}I therapy was 385 mg/ml and anti-thyroglobulin antibody was 0.9 IU/mL, while TSH was 81.3 µIU/ml (0.3-5.0 µIU/ml) because of the suspension of levothyroxine. She was treated with 200 mCi of oral radioactive ^{131}I. Post-treatment ^{131}I scan showed essentially radioiodine uptake in the right scapula (Figure 5).

The patient was advised injection Zometa for bone strengthening. The patient is now on follow-up and injection Zometa is being injected into her every month.

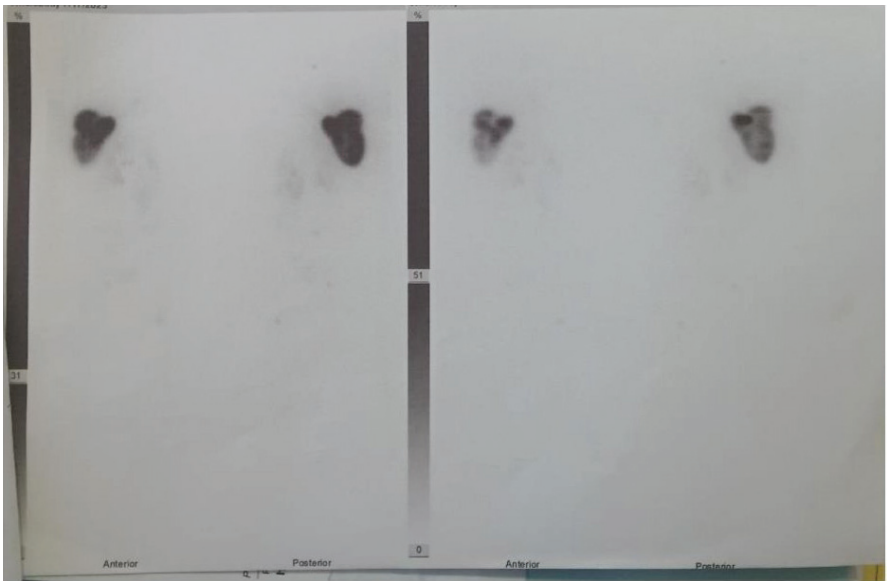

Figure 5. *Whole-body Iodine 131 scan showing radioiodine uptake in right scapula.*

Discussion

FTC, known for its hematogenous spread, poses a unique challenge when presenting with atypical metastases, such as in the scapula. Management involves a multidisciplinary approach, combining surgical, radiopharmaceutical, and supportive therapies.

Surgical excision remains the cornerstone for local and accessible metastases; however, in cases with extensive invasion into surrounding structures, as seen in this patient, surgery may be contraindicated [11,12]. For such cases, RAI therapy is pivotal, given its ability to target metastatic lesions effectively. Administering high doses, as demonstrated in this case with 200 mCi of I-131, not only reduces tumor burden but also allows imaging of metastatic sites via post-therapy scans, which is integral for treatment monitoring [7,13].

Adjunctive therapies like Zometa, a bisphosphonate, play a crucial role in managing bone metastases. By inhibiting osteoclast-mediated bone resorption, Zometa strengthens skeletal integrity and reduces fracture risk, improving the patient's quality of life [10].

Long-term follow-up, as advised by the American Thyroid Association guidelines, is essential for early detection of recurrence or metastases. Regular measurement of serum thyroglobulin (Tg) and anti-Tg antibodies, combined with neck ultrasound, ensures vigilant monitoring [13]. In cases of elevated Tg, imaging modalities, such as MRI and CT, are instrumental in identifying metastatic lesions [5,6].

Comprehensive patient counseling is critical to emphasize the necessity of adherence to follow-up schedules. In this patient, the delay due to the COVID-19 pandemic highlights the risks of losing follow-up, which can result in late presentations of metastases.

This multidisciplinary and stratified approach underscores the importance of tailoring treatment plans to individual patient needs, ensuring optimal outcomes even in rare and complex metastatic scenarios.

Conclusion

The case emphasizes the critical importance of prolonged monitoring in patients with FTC, considering the potential for delayed and rare metastatic presentations. It highlights the multidisciplinary role of advanced imaging, pathology, and nuclear medicine in accurately diagnosing and managing such cases. This report also underscores the therapeutic value of RAI in treating metastatic lesions and the adjunctive use of bone-strengthening agents like Zometa in enhancing patient outcomes. Proper patient counseling about long-term follow-up is essential for detecting and managing distant metastases effectively.

Conflict of interest

The authors declare no conflict of interest.
Patient consent was taken for publication.

Funding

None.

Ethical approval

The Ethical Review Committee has reviewed and approved the ethical statement associated with the manuscript titled FTC with Uncommon Metastasis to the Scapula: A Nine-Year Follow-Up. This study complies with ethical guidelines, including obtaining informed consent, ensuring confidentiality, managing risks, maintaining data integrity, and disclosing conflicts of interest. This approval, letter number Dir-3(17)/24, confirms adherence to the highest ethical standards and supports the publication of your paper.

Data availability

Data are available as per request.

Authors' contributions

All authors contributed equally.

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