

# Nodular goiter with multiple cystic and solid swellings

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### ABSTRACT

Thyroid nodules are very common in the general population, but only 5% are malignant. We report the case of a man presenting with nodular goiter, and multiple swellings over the scalp and arm, with pathological fractures. On evaluation by fine needle aspiration, these swellings were found to be metastases from follicular thyroid carcinoma. The patient underwent total thyroidectomy, radioiodine ablation, resection of the bone lesion, and L-thyroxine suppressive therapy, with no recurrence / metastasis over a five-year follow-up.

**Key words:** Follicular thyroid carcinoma, metastasis, radioiodine ablation

## INTRODUCTION

Thyroid nodules are very common in clinical practice. Their prevalence depends, to a great extent, on the method used for detection. By palpation, which is the least sensitive method, approximately 5% of the people are found to have nodules.<sup>[1]</sup> Based on an ultrasound investigation, a frequency of thyroid nodular disease as high as 30 – 40% (in women) and 20 – 30% (in men) of the adult population, in iodine-deficient areas, has been reported<sup>[2]</sup>

Although most thyroid nodules are benign, approximately 5% harbor malignancy<sup>[1]</sup> Follicular thyroid cancer (FTC) is the second most common among the differentiated thyroid cancer (DTC), which usually presents as an asymptomatic solitary intra-thyroid nodule. Distant metastases occur in less than 10% of the patients with papillary (PTC) and follicular thyroid carcinoma<sup>[3]</sup> Follicular carcinoma is uncommon in males, especially at a young age. Furthermore, metastasis from a DTC

presenting as a swelling and a pathological fracture is uncommon.

We report a man presenting with nodular goiter, and multiple metastatic swelling over his scalp and arm.

## CASE REPORT

A 35-year-old male, with a painless thyroid swelling for 15 years, presented with a slowly increasing painless swelling over the scalp for two years and a painful swelling over the left upper arm after a trivial trauma for 15 days. He gave no history of any recent change in the thyroid swelling, pressure symptoms, bony pains, weight loss or any symptoms suggestive of hypo- or hyperfunction of the thyroid gland.

On examination, his pulse was 80/ minute, regular, blood pressure 120 / 70 mmHg, and body mass index was 20.2 Kg / m<sup>2</sup>. He had a grade III, non-tender, nodular goiter (right lobe), but no bruit, enlarged, firm cervical lymph nodes of varying size (1 cm – 2.5 cm), and a 10 cm in diameter cystic, non-tender scalp swelling [Figure 1a]. He also had a left upper arm swelling, which was bony and hard, with restriction of movements at the shoulder joint.

Investigation revealed hemoglobin 11 gm / dl (11.5 – 14) with normal serum biochemistry including corrected calcium

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10.4103/2230-8210.98034

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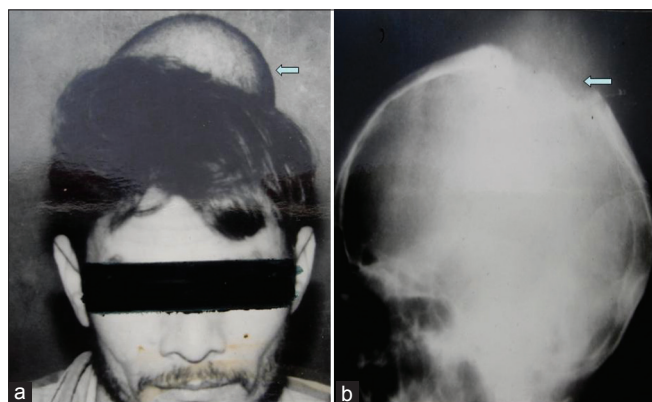
9.5 mg / dl, PO<sub>4</sub> 3.3 mg / dl, and alkaline phosphatase 9 KA units (3-13). A hormonal work-up revealed T3 1.13 ng / ml (N 0.5 – 1.6), T4 49 ng / ml (N 45 – 125), TSH 1.74 μIU / ml (N 0.5 – 5), and serum PTH (intact) 35 pg / ml (N 12 – 70). His radiological investigations are displayed in Figures 1a, b and Figures 2a, b. Ultrasonography of the neck revealed a hyper echoic lesion (5 × 4 cm) in the right lobe, with areas of calcification. Fine needle aspiration cytology (FNAC) from the thyroid gland, lymph node, scalp, and a bony swelling over the left arm revealed a similar morphology, suggestive of follicular carcinoma.

The patient underwent total thyroidectomy and histopathology of the respected thyroid mass and confirmed the diagnosis of differentiated follicular thyroid carcinoma. He received radioiodine ablation and resection of the bone lesion in the upper humerus and is presently on L-thyroxine suppressive therapy, with no recurrence / metastasis over five years of follow-up.

## DISCUSSION

Differentiated follicular and papillary thyroid carcinomas are generally most indolent, solid neoplasms, with long-term survival. Nevertheless, a hematogenous spread from the FTC may occur to distant sites, such as, the lung, bone, and brain; although metastasis to the bone is not common. The vertebrae, pelvis, ribs, and sternum are frequently affected bones, while the skull bone and humerus are less commonly involved<sup>[4]</sup>

In the present case, euthyroid nodular goiter, with cervical lymphadenopathy suggested the diagnosis of thyroid carcinoma. Other differential diagnoses in such a setting are summarized in Table 1. However, considering the swelling over the scalp and the left upper arm as hematogenous seedlings from a nodular lesion of the thyroid, diagnosis of follicular thyroid carcinoma with metastases was made.



**Figure 1:** (a) Clinical photograph showing large soft tissue swelling over scalp. (Arrow), (b) X-ray skull lateral view showing lytic lesion over skull. (Arrow)

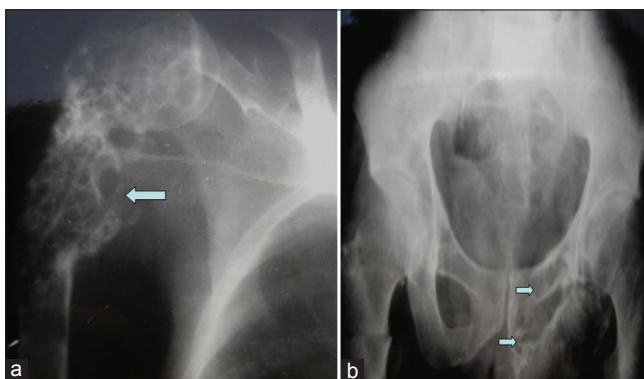
Similar cell-cytology from all four sites (thyroid, lymph node, scalp, and upper arm swelling) laid support to the diagnosis.

The bone metastases are recognized by X-ray, computed tomography (CT), 99m Tc MDP bone scan, and <sup>131</sup>I whole body scan after total thyroidectomy. The radiology revealed lytic lesions in the upper humerus, pelvis, and skull, suggestive of synchronous bone metastases in the present case. This was further substantiated by the <sup>131</sup>I whole body scan. Bone metastases at the time of diagnosis of thyroid cancer is seen in 40 – 75% of the cases and is known as synchronous metastasis, like in the present case.<sup>[5]</sup> In a large series of 444 patients of DTC, bone metastases were the only site in 36% of the patients with FTC and 12% of patients with PTC, and in 22% of the patients younger than 60 years and 34% of the patients over 60 years.<sup>[6]</sup> Synchronous metastasis is a strong predictor of a poor outcome. The metastatic lesions are quite frequent in the vertebrae (27%) and pelvis (23%), however, such lesions in the long bones and skull are less common (6% each<sup>[4]</sup> Multiple bone site involvement at a given time is also quite frequent (40%), as seen in our patient.<sup>[7]</sup>

Patients with metastatic disease need a complete workup. The extent of disease is appreciated by a <sup>131</sup>I whole body scan following total thyroidectomy. Radioiodine (<sup>131</sup>I) is the main treatment modality in patients, with <sup>131</sup>I uptake, and may be associated with local treatments such as external beam radiation therapy or surgery.<sup>[8]</sup> Bone metastatic deposits usually do not respond favorably to <sup>131</sup>I ablative therapy and patients seldom survive 10 years after treatment.

**Table 1: Differential diagnosis of euthyroid nodular goiter with cervical lymphadenopathy**

Thyroid carcinoma (papillary/follicular/anaplastic)
Medullary carcinoma of thyroid
Thyroid lymphoma
Granulomatous disease (eg. tuberculosis)
Parathyroid carcinoma (rare)



**Figure 2:** (a) X-ray left humerus showing lytic lesion over upper half of shaft and head of humerus. (Arrow), (b) X-ray pelvis showing lytic lesions obturator margins of the pubis bone. (Arrow)

The poor response to radioiodine is apparently due to the lower capacity of the bone lesion to take I<sup>131</sup>.

Multi-site bone metastasis is associated with decreased survival, but Pittas *et al.* have reported survival with single bone metastasis as being no different from those with multiple bone metastasis.<sup>[9]</sup> Unresectable bone metastases with good tracer uptake (I<sup>131</sup>) can be treated with radioiodine. The index case had synchronous multisite bone metastasis and was managed with me<sup>131</sup>. However, patients with localized bone disease (solitary metastasis) subjected to radical resection yield a longer disease-free interval and better quality of life.

Univariate analysis for disease-specific survival in metastatic thyroid carcinoma indicated metachronous bone metastasis and the presence of distant metastasis at sites other than the bone, as indicators of a significantly worse prognosis. The type of cancer (PTC or FTC) was not a significant indicator of prognosis. A significant survival advantage was observed among patients who underwent radioactive iodine therapy, and better prognosis seemed to be obtained with greater doses of radioactive iodine. Operative resection of metastatic bone lesions also seemed to be associated with better prognosis.<sup>[3]</sup>

Follow-up of these patients must include a yearly I<sup>131</sup> whole body scan and estimation of serum thyroglobulin after discontinuing L-thyroxine. Despite the good prognosis for differentiated thyroid carcinomas, 10% of all patients with papillary and 20 – 40% with follicular carcinoma, die as a result of complications from distant metastases.

To conclude, follicular thyroid cancer may present as cystic

and bony swellings without any local neck manifestations. Total thyroidectomy and radioiodine <sup>131</sup>I have survival benefit.

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**Cite this article as:** Rastogi A, Bhadada SK, Bhansali A. Nodular goiter with multiple cystic and solid swellings. *Indian J Endocr Metab* 2012;16:651-3.

**Source of Support:** Nil, **Conflict of Interest:** None declared.