

# Malignant Fibrous Histiocytoma Metastatic to the Thyroid Gland

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## ABSTRACT

**Introduction:** Malignant fibrous histiocytoma (MFH) metastatic to the thyroid is rare. In this case report and literature review, we discuss the presentation, diagnosis and treatment of MFH.

**Materials and methods:** We present a case of MFH metastatic to the thyroid. A literature review on malignant fibrous histiocytoma involving the thyroid was performed.

**Results:** We present a case of MFH metastatic to the thyroid from a lower extremity primary, treated by excision. The initial diagnosis of MFH metastatic to the thyroid relies on history and histopathology. Treatment is excision, sometimes followed by adjuvant radiotherapy and/or chemotherapy.

**Conclusion:** This is the sixth documented case of MFH metastatic to the thyroid. Due to the rarity of this disease, treatment decisions should be made on a case-by-case basis.

**Keywords:** Malignant fibrous histiocytoma, Thyroid cancer.

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## INTRODUCTION

Malignant fibrous histiocytoma (MFH) is one of the most common soft tissue sarcomas in adults, most commonly affecting the extremities and retroperitoneum. Seven percent of cases of primary MFH of the head and neck occur in the thyroid with 21 reported cases.<sup>1-4</sup> MFH metastasizing to the thyroid is even more rare with only five documented cases noted in the literature.<sup>5-8</sup> MFH more commonly metastasizes to the lung, lymph nodes, liver and bones.<sup>1</sup> In our case, the primary disease process metastasized from the lower extremity to the lungs and brain before involving the thyroid.

## MATERIALS AND METHODS

A patient with MFH metastatic to the thyroid treated at the VA Gulf Coast Veterans Health Care System, Biloxi, MS, Department of Otolaryngology, is presented. Case presentation, histopathology, treatment and outcomes are reviewed.

## RESULTS

A 52-year-old male with MFH of the left lower extremity, recurrent at the primary site and metastatic to both lungs and to the brain, presented to the otolaryngology clinic with progressively worsening dysphagia and a rapidly enlarging central neck mass for 1 month. The patient presented to our clinic 1 week after his third craniotomy for metastatic MFH lesions.

A fixed, nontender mass of the left-central neck was palpated on examination. Flexible fiberoptic laryngoscopy revealed normal, symmetric vocal cord motion. Ultrasound and computed tomography with contrast of the neck demonstrated a 4.5 × 6.2 cm heterogenous mass arising from the left thyroid lobe, with necrosis and tracheal compression and rightward deviation (Fig. 1). The right thyroid lobe and isthmus were clinically and radiographically unremarkable.

Given the patient's history, a presumptive diagnosis of malignant fibrous histiocytoma metastatic to the thyroid was made. In light of compressive symptoms and concern for airway compromise, the patient was taken to the operating room for palliative/diagnostic left thyroid lobectomy and isthmusectomy (Fig. 2). Macroscopically, the left thyroid lobe was well-encapsulated, with firm, gray-tan areas at the superior and inferior poles. The contralateral thyroid lobe and central neck compartment were grossly normal on intraoperative inspection.

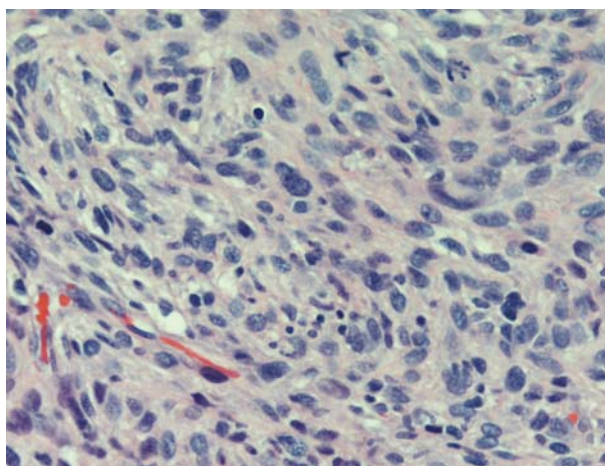
Pathologic examination revealed spindle cells in a fascicular arrangement with hyperchromatic, pleomorphic, bizarre nuclei with marked atypia (Fig. 3) and areas of hemorrhage and necrosis. Immunohistochemical stains were positive for vimentin and CD-68. Direct comparison of the



Fig. 1: Neck ultrasonography revealing a 4.5 × 6.2 heterogenous mass emanating from the left thyroid gland



**Fig. 2:** Intraoperative photograph: Left thyroid mass after ligating all vascular pedicles. Note the firm, gray-tan areas at the superior and inferior poles (photo left—superior, right—inferior)



**Fig. 3:** Hematoxylin-eosin stain. Spindle cells containing foamy eosinophilic cytoplasm and hyperchromatic, pleomorphic, bizarre nuclei with marked atypia

thyroid histopathology with slides of the primary tumor confirmed metastatic MFH to the thyroid gland.

The patient elected not to receive a completion thyroidectomy. Adjuvant radiotherapy to the thyroid bed was not recommended by our tumor board, given the multiple prior treatments of extensive metastases. A plan of observation of the contralateral gland was agreed upon. The patient unfortunately developed new metastatic lesions to his liver and brain with declining cognitive function and elected hospice care. He died in November 2009.

## DISCUSSION

MFH of the thyroid is characterized by aggressive local growth and tends to be advanced at presentation. In a review of 12 cases of primary MFH of the thyroid, all patients presented with a rapidly enlarging neck mass, with or without compressive symptoms.<sup>4</sup> Unless a history of MFH

already exists, it is difficult to clinically differentiate this pathology from anaplastic thyroid carcinoma.

Fine needle aspiration (FNA) is the least invasive modality by which to obtain tissue for diagnosis but is of limited diagnostic value for metastatic sarcoma of the thyroid, in part due to histopathologic similarities between metastatic sarcoma and the spindle variant of anaplastic thyroid carcinoma, including spindle cells, pleomorphism and a storiform pattern.<sup>5,6,8</sup> Therefore, immunohistochemical staining for markers, including vimentin, alpha-1-antichymotrypsin, alpha-1-antitrypsin and CD-68 (versus anaplastic thyroid carcinoma-associated markers vimentin, cytokeratin and CK-18) aid in diagnosis.<sup>3,4</sup>

The primary treatment of MFH is wide local excision. Margin status, size, depth and histopathologic features of the tumor are important prognostic factors. Surgical options for MFH of the thyroid consist of total thyroidectomy, subtotal thyroidectomy, hemithyroidectomy or partial lobectomy. Regional lymph node metastases are uncommon [15% (8/54) of primary MFH of the head and neck; 25% (3/12) primary MFH of the thyroid].<sup>1,4</sup> Therefore, neck dissection is only indicated for clinically or radiographically positive lymph nodes.

Adjuvant radiotherapy has been utilized to improve local control in patients with sarcomas of the head and neck, but there is little data specific to MFH of the thyroid.<sup>9</sup> In Zeng's review of 12 cases of primary MFH of the thyroid, 5/11 patients received postoperative radiotherapy. Four of these five patients had macroscopic residual tumor at time of excision and died of their disease within 16 months post-treatment.<sup>4</sup> Yavuz et al reported a case of primary MFH of the thyroid: Adjuvant radiotherapy was pursued for recurrence following subtotal thyroidectomy and modified right neck dissection, and the patient remained free of disease 5 years posttreatment.<sup>2</sup> Haugen reported one case of postoperative radiotherapy for MFH metastatic to the thyroid (from an atrial primary) following left hemithyroidectomy with positive surgical margins.<sup>8</sup> Although there was no further progression of disease in the neck, the patient developed multiple brain metastases.

Primary or secondary chemotherapy for MFH of the thyroid is less commonly employed than radiotherapy. In Zeng's review, two of 12 patients with primary MFH of the thyroid were administered chemotherapy (cyclophosphamide, vincristine, adriamycin and dacarbazine). One patient who underwent an incomplete excision of his primary tumor followed by chemotherapy succumbed to distant relapse 6 months after treatment. The other patient underwent palliative chemotherapy after a biopsy of the inoperable primary tumor and was lost to follow-up.<sup>4</sup>

MFH metastatic to the thyroid is a rare entity. Diagnosis relies on history and histopathology with immunohistochemical stains and comparison to the primary source slides. Aggressive surgery remains the mainstay of treatment. Prior studies reported wide local excision by hemithyroidectomy, subtotal thyroidectomy or total thyroidectomy, with neck dissection for clinically or radiographically apparent lymphadenopathy. Adjuvant radiotherapy and chemotherapy have been utilized for MFH of the thyroid, but too few cases exist to support a locoregional control or survival benefit. Prognosis is poor; MFH of the head and neck carries an overall 5-year survival rate of 48%.<sup>1</sup> Therefore, treatment decisions regarding the extent of surgery and adjuvant therapy should be made on a case by case basis.

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