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ORIGINAL RESEARCH

Metastases to the thyroid gland- two year study at a tertiary care centre

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Abstract

Introduction: Metastasis to thyroid gland is very rare accounting for less than 4% of all thyroid malignancies.The most common tumours which are reported to metastasize to thyroid are breast and kidney malignancies.This study was aimed to study the incidence and primary origin of metastatic tumours to the thyroid diagnosed by FNA and to examine their clinic-pathologic and cyto-morphologic features.

Methods: Six cases of metastatic lesions to thyroid diagnosed on fine needle aspiration cytology over a period of 2 years from January 2020 to January 2022 were analysed.

Results:6 cases of metastatic lesions to thyroid were diagnosed on fine needle aspiration cytology. The patients were aged between 55 to 70 years with 2 male and 4 female patients. Primary tumour was known in 4 cases, while 2 cases on further evaluation revealed primary squamous cell carcinoma of lung metastatic to the thyroid.

Conclusion: Lung cancer was the most common tumour to metastasize to the thyroid gland, contributing 50% of the cases in our study. The diagnosis of metastatic thyroidtumours should be considered for thyroid masses in patients with a history of malignancy in other organs.

Keywords: Thyroid, metastasis, fine needle aspiration cytology.

Introduction

Metastasis to thyroid gland is very rare. They represent less than 4% of all thyroid malignancies in clinical studies [(1)]. Although thyroid fine-needle aspiration (FNA) and core needle biopsy (CNB) are commonly utilized modalities in the evaluation of thyroid nodules, metastatic tumours to the thyroid are only rarely encountered, with a reported incidence ranging from 0.6% to 5.7% in literature [(2)]. The most common tumours which are reported to metastasize to thyroid are breast and kidney malignancies[(3)].

Hence it is desirable to confirm the diagnosis by a less invasive diagnostic modality such asFNA. Our study was aimed to study the incidence and primary origin of metastatic tumours

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to the thyroid diagnosed at our institution by FNA and to examine their clinic-pathologic and cyto-morphologic features.

Materials and methods

We analysed six cases of metastatic lesions to thyroid diagnosed on fine needle aspiration cytology over a period of 2 years from January 2020 to January 2022. Image guided FNAC was done in four cases, while two cases underwent blind aspiration. 20 gauge needle was used and smears were wet fixed for Papanicolou staining and air dried for May-GrunwaldGiemsa staining. Cell blocks were prepared in all the cases.

All procedures performed in the study titled "Metastasis to the thyroid gland- Two year study at a tertiary care centre" were approved by the Institutional Review Board (IRB) vide reference no. SIMS-168/2020-324A, Dated: 07/07/2020 in accordance with the 1964 Helsinki declaration and its later amendments.

Results

Six cases of metastatic lesions to thyroid were diagnosed on fine needle aspiration cytology (fig:1).

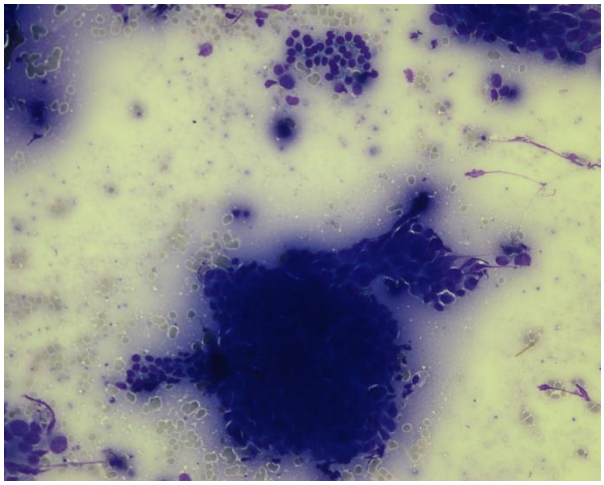

Fig 1: Infiltrating ductal carcinoma breast metastatic to thyroid (MGG 40X). A focus of benign thyroid follicular cells is seen at 12 O'Clock position.

The patients were aged between 55 to 70 years. There were two male and four female patients. Primary tumour was known in four of the sixcases, while two cases on further evaluation revealed primary squamous cell carcinoma of lung metastatic to the thyroid (fig:2).

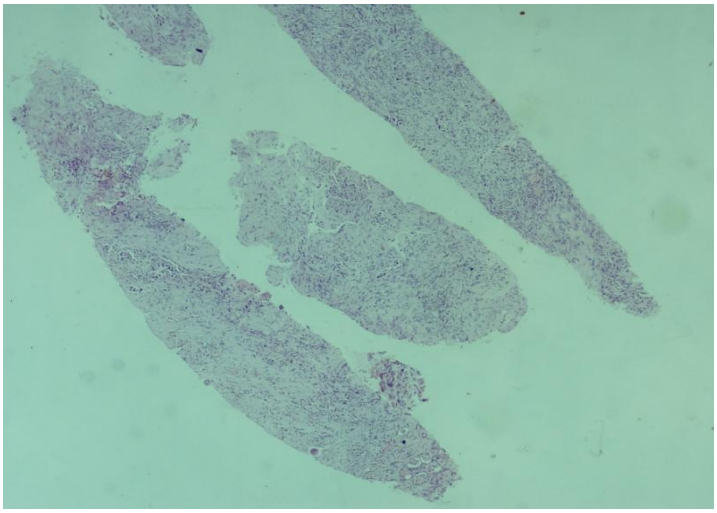

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Fig 2: Trucut biopsy of thyroid showing metastatic deposits of squamous cell carcinoma. (H&E 4X)

One of the patients underwent thyroidectomy for de-bulking as the enlarged thyroid led to mass effects on the trachea. Cell blocks were prepared in all the cases (fig.3) and immunohistochemistry was done on one of blocks.

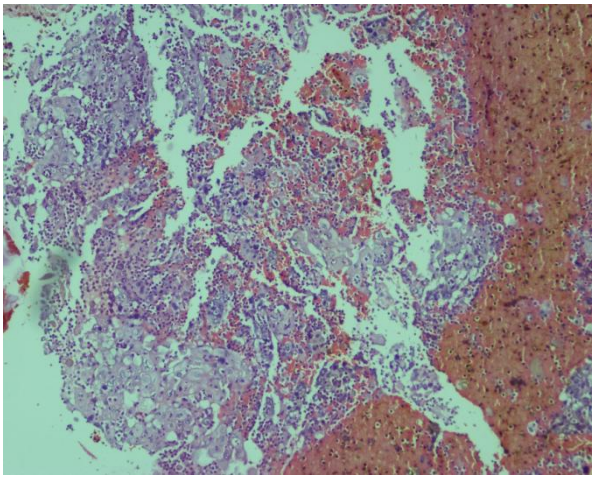

Fig 3: Cell block showing squamous cell carcinoma metastatic to thyroid (H&E 10X).

The results of the study are summarised in Table 1.

Table 1:

S.no	Age/sex	Clinical symptoms	Radiological findings	Diagnosis in thyroid	Primary tumour site	Metastasis to other organs
1.	60/M	Hemoptysis, convulsions, swelling neck	Hypoechoic lesion in right lobe thyroid on USG,lesion in right upper lobe lung, right parietal lobe enhancing lesion brain on CT	Metastatic squamous cell carcinoma	Lung	Brain
2.	62/F	Dysphagia, swelling neck.	5x6mm hypoechoic lesion with internal calcification in right lobe of thyroid on USG,Enhancing polypoidal thickening at GE junction on CECT	Metastatic adenocarcinoma	Gastroesophageal junction.	None
3.	65/F	Swelling left side of neck moving with deglutition.	1x2cm hypoechoic lesion left lobe of thyroid on USG.	Metastastic squamous cell carcinoma.	Unknown	None
4.	68/M	Swelling left side of neck with dysphagia	5x4 cm hypoechoic lesion thyroid with extension into mediastinum.	Metastatic squamous cell carcinoma	Unknown	None
5.	70/F	Generalised lymphadenopathy with swelling neck	2x1 cm swelling right lobe thyroid with calcification.	Non-Hodgkin's Lymphoma.	NHL(DLBCL)	Involvement of bone marrow.
6.	55 /F	Swelling neck with dyspnoea	1x1.2cm swelling in left lobe of thyroid	Metastatic IDC	BREAST	Lung

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Discussion

The incidence of thyroid cancer has continuously increased overthe last decade. However, it is unusual to see patients withmetastasis to thyroid in clinical practice. The incidence ofsecondary thyroid tumour has been reported to be as low as 2% to3% of all malignant tumours of the thyroid[4,5]. It has been demonstrated that breast was the secondly frequent primary cancer site for thyroid metastases[6,7].Currently, the aetiology of thyroid metastases from primary carcinoma is not clarified. One study speculated that decreased oxygen and iodine resulted by local thyroid diseases (i.e.thyroiditis and goitre) may contribute to the genesis of thyroid metastases[8].

Metastatic thyroid disease is usually associated with cancer dissemination through blood from a distant focus or with a direct or lymphatic spread to the thyroid gland by a neoplastic process situated in the adjacent organs. The most frequently reported nonthyroid malignancy is renal clear cell carcinoma, followed by colorectaland lung carcinoma[9]. In our study 3 of the 6 cases showed metastasis of squamous cell carcinoma from lung followed by one case each from breast and gastroesophageal junction. One patient, known case of Non-Hodgkin's lymphoma thyroid involvement was seen six months after the diagnosis of lymphoma. Metastatic thyroid tumours are frequently seen in the elderly patients in 7^{th} and 8^{th} decade of life[10]. In the present study most of the patients were in the 7^{th} decade of life. Duggal and Horattas[11]noted a 6:1 female-to-male ratio of metastases to the thyroid gland. In our study there were 4 females as against 2 males, a ratio of 2:1. Thyroid metastases may present with symptoms such as dyspnoea, dysphagia, and hoarseness, have an asymptomatic mass, or even be clinically occult.Tumours originating from adjacent organs such as the trachea, oesophagus, or larynx often cause symptoms such as dyspnoea,dysphagia, or hoarseness, which mimics primary thyroid cancer[10].

In 4 of 6 cases metastases were found metachronously, which occurred some years after the diagnosis of primary tumours. The longest interval between the initial diagnosis of primary tumours and metastasis to the gland has been reported to be 21 years[12].

With the limited patient data available, there is no definitive evidence to support surgery or chemotherapy or radiotherapy for thyroid metastasis[13]. Thyroid metastases can be diagnosed on thyroidectomyspecimen or by FNA. Immunohistochemistry can aid in differentiating primary thyroid malignancy from secondary malignancy. The prognosis of metastases to the thyroid depends on the stage of the primary tumour and the extent of disease dissemination rather than metastasis to thyroid [14].

Several studies have suggested that the prognosis of thyroid metastases is poor [15].

Conclusion

Lung cancer is the most common tumour to metastasize to the thyroid gland. Contributing 50% of the cases in our study. The diagnosis of tumours metastatic to thyroidshould be considered for thyroid masses in patients witha previous history of malignancy. For a primary tumour with poorprognosis, excision of the secondary metastatic thyroid cancermay not be recommended.

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