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Case report

THYROID METASTASES FROM BREAST ADENOCARCINOMA DIAGNOSED BY FINE NEEDLE ASPIRATION CYTOLOGY: A CASE REPORT

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ABSTRACT

Despite being second only to the adrenal gland in terms of relative vascular perfusion, the thyroid gland is a rare site of metastatic disease; but when thyroid metastases occur, long term survival has been reported to be dismal. Metastases to the thyroid are uncommon, but the number of cases seems to have increased in recent years. This increase may be related to more frequent use of fine needle aspiration biopsy (FNAB) in suspected cases. In clinical papers, the incidence of metastases to thyroid is low and, according to various sources, amounts to 2-3% of all malignant tumors of the thyroid. Most commonly the primary tumor is located in the breast, bronchi, GIT (the colon, esophagus, or stomach) and kidney. Usually metastatic thyroid disease is identified upon autopsy, and only in sporadic cases. We present a case of breast Adenocarcinoma metastases to thyroid which was diagnosed on FNAC.

Keywords: Adenocarcinoma, Thyroid Metastases, FNAC

INTRODUCTION

The thyroid is a vascular organ and therefore can be the site of blood borne metastases from other cancer. The most blood borne metastases are found in the organs that receives a significant amount of cardiac output such as the lung, liver, brain and bone marrow.¹⁻⁴ Various cancers have a propensity to metastasize to particular sites such as prostate cancer to the skeleton and bowel cancer to the liver. Breast cancer is the most common tumor that metastasizes to the thyroid. They usually occur when there are metastases elsewhere, sometimes many years after the diagnosis of the original tumor.⁵

There is a wide range from 1.25% in unselected patients to 24.2% in selected patients with known metastatic cancer.

How to diagnose metastases to thyroid in patients:

If the patient is known to have non thyroidal cancer

with wide spread metastases and has a new thyroid nodule.

Patient with a known cancer but no evidence of metastases might develop a nodule that on FNA is consistent with metastases from the primary cancer.

When a rapidly growing nodule arises in a patient with a previously diagnosed cancer and no prior thyroid disease.

In the Mayo clinic series, 12/43 patients developed the thyroid metastases more than 10 years after the diagnosis of primary cancer.

Patients can be present with the following symptoms: Thyroid nodule, Cervical mass, Hoarseness of voice, Dyspnea, Cough, Dysphasia, Asymptomatic

CASE REPORT

A 38 year old female presented with history of swelling over right side of neck from past four months. She had undergone right sided mastectomy four years ago for breast cancer.

On examination, she was found to have solitary swelling in the right thyroid lobe measuring 4x3 cm in size. The swelling moved with deglutination and was firm to hard in consistency. Thyroid function tests were normal.

FNAC of the swelling was done after informed consent. The aspirate showed scanty hemorrhagic material.

Processing of specimen: Air dried Methanol fixed-Geimsa stain was done. Microscopic examination revealed highly cellular smear in hemorrhagic and scant colloid background. There were seen clusters of malignant breast epithelial cells arranged in cell ball pattern, these are highly pleomorphic with increased N:C ratio, vesicular nuclear chromatin with prominent nucleoli. There was abundant eosinophilic cytoplasm. Amidst these cells were seen thyroid follicular epithelial cells and cyst macrophages and a few inflammatory infiltrate (Fig. 1, 2, 3&4)

Diagnosis of thyroid metastases from breast carcinoma was done on clinical history and FNAC features.

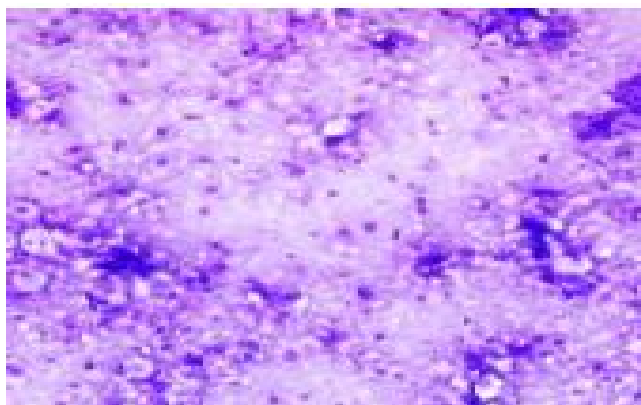


Fig 1: Aspirate shows highly cellular smear (100x)

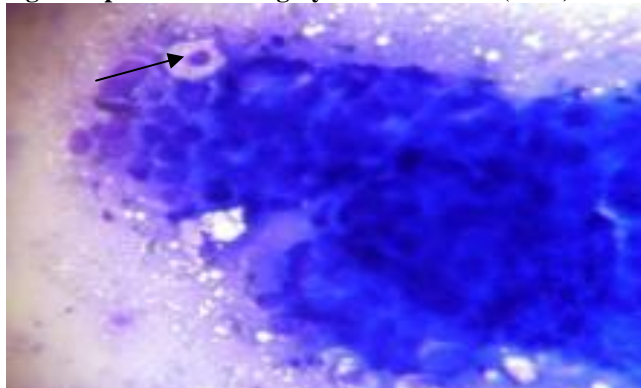


Fig 2: Few cyst macrophages seen (arrow mark) (400x)

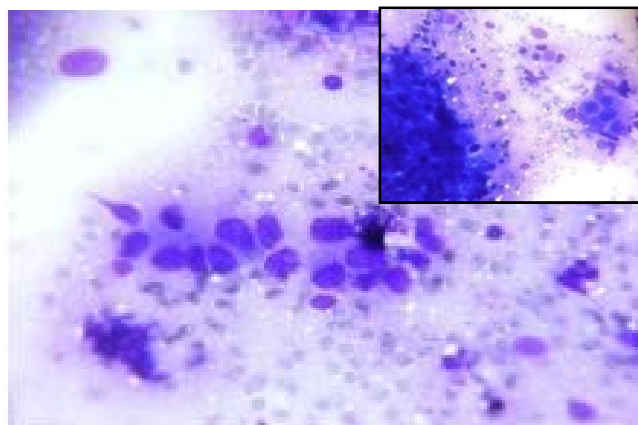


Fig 3: Few highly pleomorphic malignant epithelial cells from the breast (marked anisonucleosis, prominent nucleoli and abundant cytoplasm) inset also showing few malignant cells. (400x)

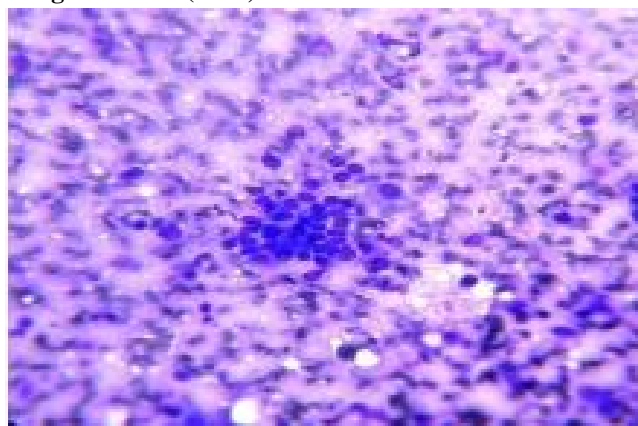


Fig 4: Few clusters of benign follicular epithelial cells with cyst macrophages.

DISCUSSION

Thyroid is a rare site of metastatic disease from other primary sites, even though this gland is highly vascular. The commonest primary site for such metastases to the thyroid is renal cell carcinoma⁶, lung carcinoma and breast in order of frequency.

Incidence of metastases to thyroid is reported from 1.2%-24% and usually as a terminal event in metastases. More than 70% cases have at least one metastases elsewhere before thyroid metastases. Thyroid metastases are seen 0.13% of thyroidectomy specimens and 0.07% of FNAC specimen worldwide. The usual age of diagnosis is greater than 60 years and median survival is 10-18 months. In 75% of cases there is a solitary thyroid nodule, in 25% of cases there is diffuse thyroid involvement and 81% are metastatic epithelial tumor.

Various previous studies showed metastatic disease to thyroid (Table1) Chang et al have showed highest no of cases of breast carcinoma metastases to thyroid,

followed by renal cell carcinoma in study series of Chen et al²

Few authors studied the frequency of thyroid metastases in autopsy series (Table 2). Silverberg and Vidone reported highest frequency of thyroid metastases, which constitute 24% and lowest frequency of 1.25% was found in Berge and Lundeberg study series.

Some evidence points to the metastases being more common in patients with underlying thyroid diseases like hurthle cell carcinoma and follicular cell carcinoma in to which renal cell carcinoma, breast carcinoma, and GI Carcinoma can metastasize.

Metastatic renal cell carcinoma and mammary carcinomas can be distinguished from follicular and papillary carcinoma without knowledge of clinical history.⁷

All metastatic carcinomas of thyroid are negative for thyroglobulin, so organ specific antigens are useful.

The diagnosis of thyroid metastases can be made with prior history of cancer. Most common age at the time of diagnosis is above 50yrs with equal gender distribution (Micheow et al from Mayo clinic). Tissue diagnosis by FNAC should be obtained. Other diagnostic modalities like thyroid scintigraphy will show cold area and the USG is not so useful because in all metastases it shows heterogeneous and hypo echoic areas.

So FNAC is the best diagnostic modality prior to surgery. The role of surgery in metastatic disease remains controversial. Surgery is the most frequently utilized of all the treatment for metastases of thyroid cancer. In some instances, only the portion of the thyroid where the tumor resides will be removed. In other cases an extraction of the entire thyroid gland may be called for.

Table: 1. Few previous studies show cases metastases to the thyroid

Reference	No of pts	Kidney	Breast	Lungs	GI tract	Melanoma	Others
Chen et al ²	10	50	-	10	20	-	20
chung et al	9	-	67	-	-	-	33
Haugen et al	-	56	12	11	12	3	6
Nikhi avniet al	43	33	16	16	9	-	26
Schorder et al ⁸	25	38	20	28	-	-	-
Wood et al ⁹	10	27	7	7	7	7	40

Table: 2. Frequency of metastases to the thyroid gland in autopsy series

Author	Study year	No of patients	% of thyroid involvement
Willis ¹¹	1931	170	5.2
Rice	1933	89	10.1
Shimoaka et al ¹²	1955-60	1980	8.6
Abrams et al ¹³	1943-1947	1000	1.9
Mortensen et al	1951-1953	467	3.9
Thorpe	1954	200	2
Silverberg and Vidone ¹⁴	1964-65	62	24.2
Berge and Lundeberg	1958-1969	16,294	1.25
Berge and Lundeberg	1958-1969	7732	2.8

CONCLUSION

We have described the case of a 38yrs old female patient presenting with thyroid nodule 4years after mastectomy done for breast cancer. We should always rise the suspicious of thyroid metastases when there is a new thyroid nodule. Although thyroid metastases is considered rare occurrence, an increasing number of patients with metastases to thyroid are being reported⁸.

TAKE HOME MESSAGE

The occurrence of new thyroid nodule in a patient with a known history of cancer has to be considered as metastatic until proved otherwise

US guided FNAC is the best diagnostic procedure used in the work up of new thyroid nodules occurring during the follow up of cancer patients

Thyroidectomy should be considered with potentially curative intention in all patients where the thyroid is the only site of known metastasis.

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