Case report

Synchronous follicular carcinoma and non-invasive follicular thyroid neoplasm with papillary like nuclear features in thyroid-A case report

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ABSTRACT

Follicular carcinoma of the thyroid accounts for 5-15% of all the primary cancers of thyroid. Follicular carcinoma clinically manifests as a painless neck mass and rarely presents with metastatic bony lesion, the most common site being the spine. Non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP) constitute 10-20% of all thyroid cancers. The histopathological diagnosis of thyroid follicular carcinoma mandates demonstration of either capsular/vascular invasion. Differentiating between follicular carcinoma and NIFTP is challenging based on histology. Hence extensive sampling of the pathological specimen is required to differentiate the same. Herein we report a case of an elderly woman presented with a pathological fracture of the femur due to metastasis from follicular carcinoma of the thyroid with an incidental NIFTP of the left lobe of the thyroid.

Keywords: Follicular carcinoma of the thyroid; non-invasive follicular thyroid with papillary-like nuclear features (NIFTP); metastasis; bony lesions.

INTRODUCTION

Follicular thyroid carcinoma arises from the follicular cells and accounts for 5-15% of the primary thyroid cancers. It is seen in elderly women with a peak incidence between the 4th to 6th decades (1). Follicular carcinoma is more frequent in areas with dietary iodine deficiency, usually presenting as a painless neck mass. The most common sites of metastasis from these tumours are bone, lung, brain, and liver. Bone metastases have been reported to occur in 2- 13% of patients with thyroid malignancy usually presenting as a pathological fracture.

The NIFTP is thought to arise from follicular cells that display follicular pattern of growth and nuclear features of papillary thyroid carcinoma with an extremely low malignant potential. NIFTP constitutes 10-20% of all thyroid cancers (2, 3). The conclusive evidence of NIFTP can be made with the histopathological examination of the thyroidectomy tissue and is based on rigidly defined standards of inclusion and exclusion criteria. The absence of capsular and vascular invasion is mandatory to the diagnosis of NIFTP (4). Here we present a rare case of follicular carcinoma thyroid with incidental NIFTP evaluated for metastatic work up.

Case report

A 59-year-old female came with a history of fall and inability to bear weight and an X-ray showed middle one-third fracture in the left femur. There was a lytic lesion in the proximal femur and iliac crest on further radiological examination. She underwent open reduction with internal fixation with intramedullary nailing with 135 degrees long proximal femoral nail for the same. An ultrasound-guided biopsy done from the left iliac crest revealed a metastatic deposit with primary possibly from thyroid. Extensive metastatic workup was done and found a thyroid swelling which was painless and asymptomatic. The neck swelling was firm and measured 5 x 5 x 3 cm which moves with deglutition with no visible skin change surface. Clinical examination revealed no palpable cervical lymph nodes. Baseline investigations along with thyroid profile were within the normal limits. Ultrasound thyroid showed an enlarged right lobe of thyroid with peripheral calcification, increased vascularity, raising the suspicion of malignancy. Fine needle aspiration cytology (FNAC) of the right lobe of thyroid revealed follicular neoplasm. The bone biopsy from the fractured site was confirmed as metastatic follicular carcinoma of the thyroid (Fig. 1A). With this, the patient was planned for total thyroidectomy with modified radical node dissection with subsequent radioactive iodine isotope scan. However, she underwent total thyroidectomy with central node dissection . The total thyroidectomy showed an enlarged right lobe measuring 5.5x4cms which was congested and nodular. Cut section showed a well-circumscribed grey white lesion was identified on the right lobe of thyroid with areas of calcification in multiple sites (Fig. 1B). Left lobe of the thyroid showed a cyst near the superior pole with tiny papillary excrescences. The demarcation between the tumour and the normal thyroid tissue

was extensively submitted for study. A single lymphnode in central compartment was dissected.

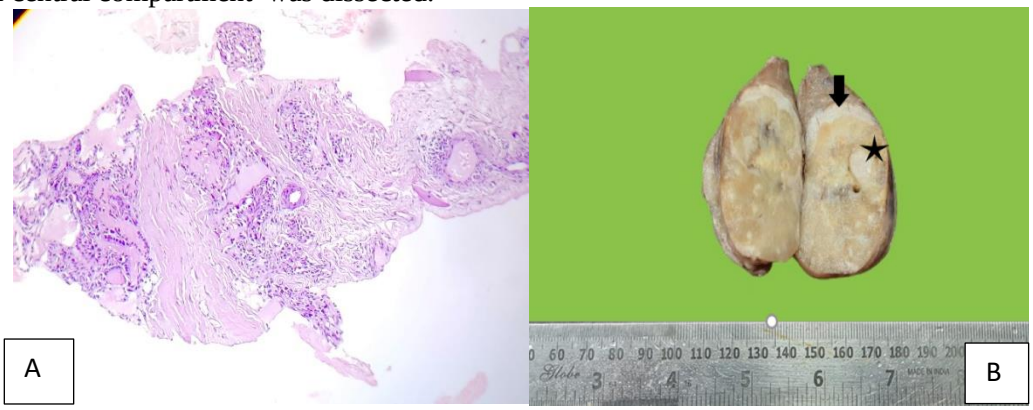

Fig.1A: Bone biopsy from the left iliac crest showing colloid-filled areas. **B:**Macroscopic picture of the right lobe well-circumscribed lesion(black arrow) with areas of calcification (star)

Microscopy of the right lobe of the thyroid showed a tumour comprising of follicles of varying sizes containing colloid with solid growth patterns and focally thickened capsule (Fig. 2A) The tumour cells infiltrated the capsule with vascular invasion and also abutted the skeletal muscle. Tumour emboli were also seen on the capsule. (Fig. 2B). The tumour cells displayed mild nuclear pleomorphism and altered chromatin pattern. Areas of calcification and degeneration changes were also visualized. The margins were free of tumour cells. Microscopy from the left lobe of thyroid with attached isthmus had an encapsulated cystic area with the follicular growth pattern of cells with the focal solid area, nuclear cleaving with an irregular contour (Fig. 2C). The adjacent thyroid shows follicles of varying sizes. The microscopy of the dissected lymph node showed only reactive change with no metastatic deposits. Thus a final diagnosis of follicular carcinoma of the right lobe with TNM staging of pT3aN0M1 with additional features of non-invasive follicular thyroid with papillary-like nuclear features of the left lobe was made.

The postsurgical period was uneventful and she was planned for radioactive ablation for two weeks. However, the patient didn't consent to further therapy and was discharged.

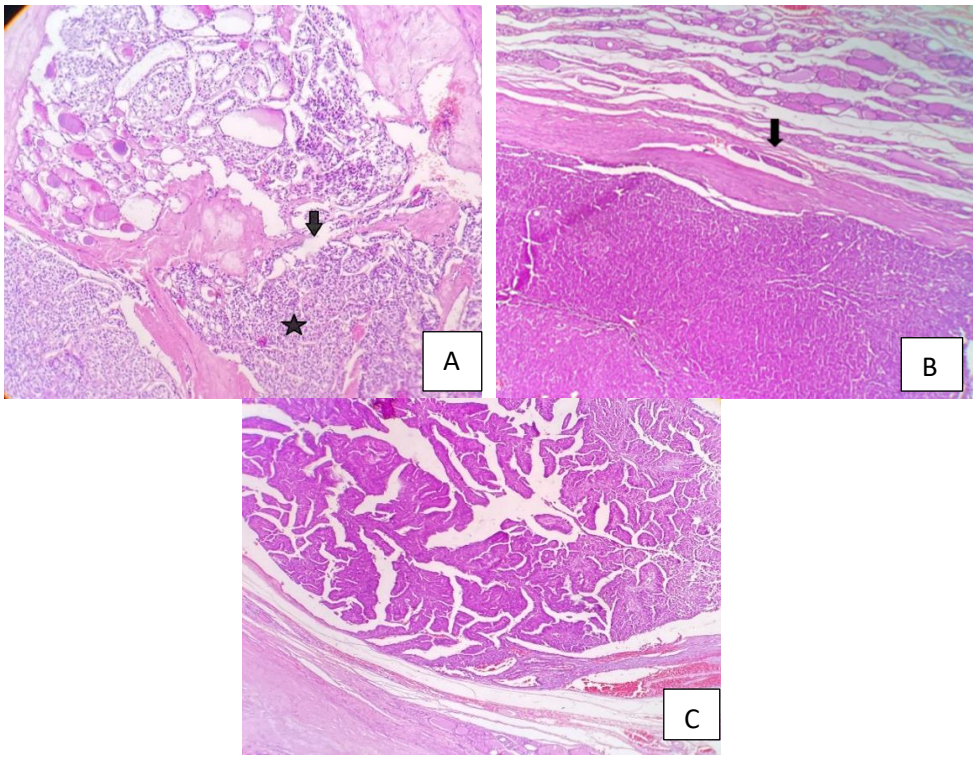

Fig.2.(A): Black arrow -Microscopic picture (40X) capsular invasion by tumour cells (H & E) black star –solid growth pattern; **(B)**: Tumour emboli in the capsule (black arrow) (H & E); **(C)**: left lobe of thyroid shows encapsulated, abortive papillary arrangement with papillary like nuclear features, H & E.

DISCUSSION

Follicular carcinoma is a malignancy of the thyroid follicular cells with no diagnostic nuclear features of papillary carcinoma of the thyroid and accounts for 2% of all primary tumours (3). According to the 2017 WHO classification of thyroid tumours, three variants of follicular carcinoma have been identified which are minimally invasive, encapsulated angioinvasion, and widely invasive. Follicular carcinoma is usually seen in adults with a neck mass but rarely with bone metastasis presenting as a pathological fracture. Bone metastasis, if present, are seen in the following frequency- spine (34.6%), pelvis (25.5%), thorax (18.3%), extremities (10.2%), shoulder girdle (5.4%), and 0.6% in other sites. A close differential diagnosis of follicular carcinoma is follicular adenoma. The microscopic appearance of follicular carcinoma is extremely variable, ranging from well-formed follicles to a predominantly solid growth pattern. Poorly formed follicles, cribriform areas, or trabecular formations may be present at times in combination. The presence of capsular invasion is a must to diagnose as follicular carcinoma. Focal or extensive cytoplasmic clear changes can occur (5). Mitotic activity and nuclear atypia are usually seen but may be entirely lacking the diagnosis. Widely invasive follicular carcinomas show the extensive invasion of the thyroid and extrathyroidal soft tissue along with the vascular invasion. Follicular carcinoma having only capsular invasion without vascular invasion. Excellent prognosis is noted in follicular carcinoma with only capsular invasion devoid of vascular invasion. Angioinvasive follicular carcinoma has a poorer prognosis (1, 5)

NIFTP formerly termed as the Non Invasive Encapsulated Follicular Variant of Papillary Thyroid Carcinoma is seen in adults with a peak incidence in the fourth to sixth decade of life. It has nuclear features of papillary thyroid carcinoma (PTC) with a follicular growth pattern. However well-formed papillae or psammoma bodies are not seen. Its clinical presentation are similar to most thyroid nodules clinically or radiologically. It is frequently observed in a euthyroid state (1, 2). Ultrasonography reveals a well - circumscribed oval to round nodule with increased vascularity and a hypoechoic outline that are more lobulated or irregular margins (6,7). Macroscopically the lesions are solitary with a thin to thick, moderately thick capsule. Secondary changes are rare. The presence of capsule or a definite demarcation from the adjacent thyroid tissue, absence of invasion, follicular growth pattern, and nuclear features of papillary carcinoma are required to be documented for the diagnosis of NIFTP. The nuclear features seen in NIFTP include nuclear irregularities ranging from grooves, folds, pseudo inclusion, and characteristic nuclear chromatin features like glassy nuclei, clearing with margination (1, 6). The pattern of growth is usually follicular with varying sizes of colloid-filled follicles. Simple papillary infolding or abortive papillary arrangement can also be seen. It should be distinguished from its mimickers like follicular adenoma, hyperplasic nodules by the presence of its characteristics nuclear features, and conventional papillary carcinoma of the thyroid by the absence of papillae. Lack of capsular or vascular invasion differentiates it from an invasive encapsulated follicular variant of papillary thyroid carcinoma. Hence these close differential diagnoses can be ruled out with a careful, extensive grossing and histopathological examination. Complete examination of the tumor capsule entirely and a vigilant eye to exclude any papillary architecture outshines the list of inclusion criteria. As NIFTP is considered to be a premalignant lesion, it can be treated with lobectomy, allowing patients to avoid complete thyroidectomy and radioactive iodine therapy (8).

In this case, the patient underwent total thyroidectomy with central node dissection with the advice of radioiodine ablation therapy. Histopathological diagnosis of follicular carcinoma of the right lobe, TNM stage- pT3aN0M1 with additional features of non-invasive follicular thyroid with papillary-like nuclear features of the left lobe was made. The lymphnode dissected did not yield any metastatic deposits. However the patient did not turn up for subsequent follow-ups.

CONCLUSION

The presence of dual neoplasm in thyroid has been reported in many literature. However, the synchronous presence of follicular carcinoma and NIFTP is not yet reported, probably, the first case reported so far. Tumour capsule must be completely studied for histopathological evaluation for a definite diagnosis.

CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

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