Non-Invasive Follicular Thyroid Neoplasm with Papillary-Like Nuclear Features: Emphasizing Diagnostic Reclassification

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ABSTRACT

Non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP) is a recently recognized thyroid tumour entity with indolent behaviour and extremely low malignant potential, introduced to avoid overdiagnosis and overtreatment of encapsulated follicular variants of papillary thyroid carcinoma (PTC). [1,2] We report a case of an adult male presenting with a solitary thyroid nodule clinically and radiologically suspicious for malignancy. Fine-needle aspiration cytology suggested atypia of undetermined significance – Bethesda category III, whereas USG neck was suggestive of TIRADS 5, prompting surgical intervention. Final histopathological examination revealed the diagnosis of NIFTP. This case highlights the diagnostic difficulty of NIFTP on preoperative fine-needle aspiration cytology and emphasizes the importance of strict histopathological criteria for accurate diagnosis and appropriate treatment.

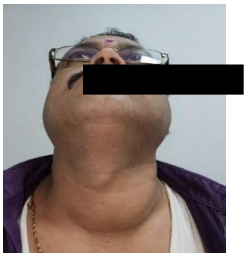
INTRODUCTION

The incidence of thyroid carcinoma has increased worldwide, partly due to improved imaging techniques, early reporting and recognition of indolent tumors. [2] Among these, the encapsulated follicular variant of papillary thyroid carcinoma posed significant diagnostic subjectivity and risk of overtreatment. [2,4] To address this, the World Health Organization reclassified this entity as non-invasive follicular thyroid neoplasm with papillary like nuclear features (NIFTP).

NIFTP is characterized by a follicular growth pattern, nuclear features resembling papillary thyroid carcinoma, and complete absence of capsular or vascular invasion.[1] Owing to its indolent behaviour, correct identification of NIFTP is essential to prevent misdiagnosis and unnecessary surgical intervention.

Case Report

A 40-year-old male presented with a slowly enlarging anterior neck swelling of seven years' duration. Physical examination revealed a solitary, firm, non-tender left thyroid nodule measuring approximately 8 x 7 x 5 cm, extending from midline to anterior border of left sternocleidomastoid and superiorly from cricoid cartilage till suprasternal notch, which moved with deglutition. Clinically, no cervical lymphadenopathy was noted.



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Thyroid function tests were within normal limit. Ultrasonography demonstrated a well-defined heterogeneous solid-cystic nodule in the left thyroid lobe with few punctate echogenic foci within, with increased vascularity and features suspicious for malignancy (TIRADS 5). Such radiological findings are commonly reported in NIFTP and frequently mimic malignant thyroid nodules.[6] Fine-needle aspiration cytology suggested atypia of undetermined significance – Bethesda category III, a known diagnostic pitfall in NIFTP.[7],[8] Patient was taken up for left hemithyroidectomy under GA. Left thyroid lobe along with isthmus was sent for histopathological examination, while recurrent laryngeal nerve of left side was preserved.

Gross Examination

The resected specimen of left thyroid lobe measured 8 × 6.6 × 4 cm.

Histopathological Examination

Microscopic examination revealed a completely encapsulated neoplasm composed predominantly of closely packed follicles with focal solid areas. Tumour cells exhibited nuclear enlargement, crowding, chromatin clearing, nuclear grooves, and occasional intranuclear pseudo inclusions, fulfilling the nuclear criteria of papillary thyroid carcinoma (nuclear score 2).[1] Dark colloid-filled follicles and stromal clefts.

No true papillary structures (>1%), psammoma bodies, tumour necrosis, increased mitotic activity, capsular invasion, or lymphovascular invasion were identified. The entire tumour capsule was thoroughly examined. Based on strict inclusion and exclusion criteria, a final diagnosis of NIFTP was made.

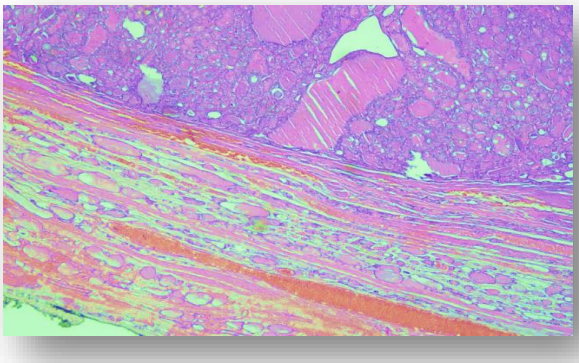

Fig. 1 Thickened capsule (4X)

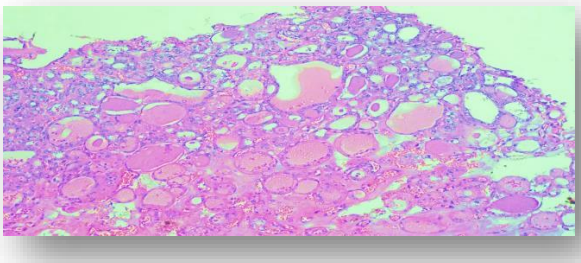

Fig. 2 Micro and Macro follicles

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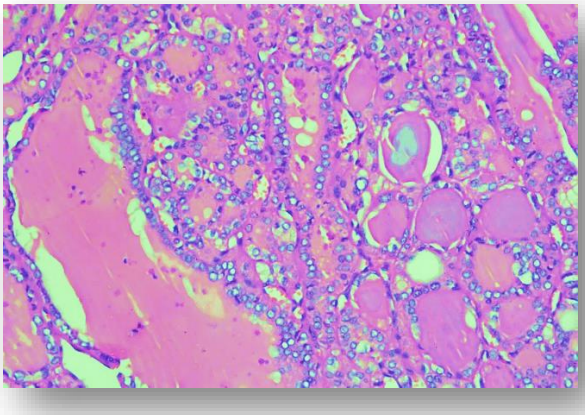

Fig. 3 **Cell lining the follicles show clearing of nuclei a feature of Papillary Carcinoma**
feature of Papillary Carcinoma

DISCUSSION

NIFTP represents a paradigm shift in thyroid tumour classification aimed at reducing overtreatment of biologically indolent lesions.[2],[4] Preoperative diagnosis remains challenging, as cytological findings often overlap with follicular neoplasms or papillary thyroid carcinoma, frequently resulting in Bethesda III/IV.

At the molecular level, NIFTPs commonly harbour RAS mutations and lack BRAF V600E mutations, supporting their biological distinction from classical papillary thyroid carcinoma.[5] Clinically, these tumours demonstrate excellent prognosis, with negligible risk of recurrence or metastasis when strict diagnostic criteria are met.[9]

The present case reinforces the importance of meticulous histopathological assessment and awareness of NIFTP among clinicians and pathologists to prevent unnecessary completion thyroidectomy or subjecting patients to radioactive iodine therapy.

CONCLUSION

NIFTP is a distinct thyroid neoplasm with papillary-like nuclear features but indolent behaviour. Accurate diagnosis requires complete surgical excision and thorough histological examination of the tumour capsule. Awareness of this entity is crucial to avoid overdiagnosis and overtreatment. Surgical excision alone is sufficient management in confirmed cases of NIFTP, with excellent prognosis.[1],[9]

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