Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Endocrinology

Characterisation and Management of Non-Invasive Follicular Thyroid Neoplasms with Papillary Nuclear Features (NIFTP): A Case Report of 10 Patients

F-Z. El Jaafari[1*], S. Ammar[1], S. Ijdda[1], S. Rafi[1], G. El Mghari[1], N. El Ansari[1]

[1]Department of Endocrinology, Diabetology, Metabolic Diseases, and Nutrition Mohammed VI University Hospital, Marrakech

DOI: https://doi.org/10.36347/sjmcr.2025.v13i03.040 | **Received:** 14.01.2025 | **Accepted:** 20.02.2025 | **Published:** 27.03.2025

***Corresponding author:** F-Z. El Jaafari
Department of Endocrinology, Diabetology, Metabolic Diseases, and Nutrition Mohammed VI University Hospital, Marrakech

Abstract **Case Report**

Introduction **:** Thyroid cancers, the most common endocrine tumours, have increased in incidence, partly due to advanced diagnostic techniques. Non-invasive follicular thyroid neoplasms with papillary nuclear features (NIFTP) are characterized by a low malignancy risk and excellent prognosis. NIFTP was reclassified in 2015 to prevent overdiagnosis and overtreatment. This study aims to explore the characteristics, management, and outcomes of NIFTP. ***Methods*** **:** This retrospective study, conducted over six years (2018–2024) at Mohammed VI University Hospital Centre, identified 10 NIFTP cases from pathology samples. All patients were referred for management and follow-up in the endocrinology department. ***Results*** **:** The cohort was predominantly female (80%) with a mean age of 56 years. Most patients presented with multinodular goitre or thyroid nodules, with some showing compressive symptoms. Ultrasound revealed multiheteronodular goitre in 80% of cases. All patients underwent total thyroidectomy, and no recurrence was observed during an average follow-up of 18 months. ***Discussion*** **:** NIFTP is associated with a very low malignancy risk and a favorable prognosis. Its diagnosis is based on histopathology, and management typically involves conservative surgery. The reclassification of EFVPTC as NIFTP helps reduce unnecessary treatments. Long-term follow-up and further research are needed to refine patient care strategies. ***Conclusion*** **:** Reclassification of EFVPTC to NIFTP allows for more conservative management, ensuring excellent patient outcomes. Ongoing advances in diagnostic and management techniques will continue to optimize care for these patients.

Keywords : Thyroid Cancer, NIFTP, Thyroidectomy, Prognosis, Molecular Biology.

INTRODUCTION

Thyroid cancers are the most common endocrine tumours, and their incidence has risen significantly in recent decades. This increase is partly due to the increased detection of indolent tumours thanks to the use of sophisticated diagnostic tools. Among these tumours, non-invasive follicular thyroid neoplasms with papillary nuclear features (NIFTP) stand out for their excellent prognosis and minimal risk of malignancy.

The concept of NIFTP was introduced in 2015 by a group of international experts to reclassify a subset of non-invasive encapsulated papillary carcinomas (EFVPTC). This reclassification responds to the need to reduce overdiagnosis and overtreatment of indolent thyroid lesions, while sparing patients the psychological and economic consequences of a cancer diagnosis.

In this context, our study aims to describe the epidemiological, clinical, paraclinical and anatomopathological characteristics of NIFTP, as well as their management and evolution.

METHODS

Our work is a descriptive retrospective study carried out over a period of 6 years (2018-2024), in the endocrinology diabetology department of the Mohammed VI University Hospital Centre (CHU) in Marrakech. Ten cases of non-invasive follicular thyroid neoplasm with papillary nuclear features (NIFTP) were identified from samples sent to the anatomopathology department of the University Hospital.

Our 10 patients with NIFTP were managed in the ENT department of the University Hospital and then referred to our department for further management and follow-up.

Inclusion Criteria : All patients with NIFTP alone confirmed by anatomopathological study on the surgical specimen were included in our study.

Exclusion Criteria: Patients with another benign or malignant thyroid tumour or with NIFTP associated with another histological entity were excluded from our study.

RESULTS

Ten of the papillary thyroid carcinomas diagnosed during the study period were NIFTP. The study population was predominantly female (80%), with a mean age of 56 (range 35-80). No family or personal history of thyroid cancer was reported in this cohort.

All patients presented with an anterior cervical swelling. Clinical examination revealed a multinodular goitre in 90% of cases and an isolated nodule in 10%. Compressive signs such as dysphonia and dyspnoea were found in 40% of cases, and signs of hyperthyroidism such as palpitations, thermophobia, transit disorders and weight loss were observed in 50% of cases. The average duration of onset of symptoms before consultation ranged from six months to 12 years, and none of the patients had any signs of lymph node involvement at the time of initial assessment.

Cervical ultrasound showed a multiheteronodular goitre (MHGN) in 80% of patients, one case of MHGN with well-limited nodules, and one case of a well-limited, hypoechoic thyroid nodule with peripheral vascularisation, suggesting encapsulated lesions. Some nodules showed microcalcifications, often associated with malignancy, but these features were not systematically present. Our patients had not undergone fine needle aspiration (FNA) cytology prior to surgery, due to the indecision of operability that was present.

The surgical specimens revealed well-demarcated, encapsulated nodules with follicular architecture and papillary nuclear characteristics (sparse, overlapping nuclei with nuclear inclusions). Microscopic analysis also confirmed the absence of capsular or vascular invasion, as well as the absence of tumour necrosis or significant mitosis. These criteria confirmed the diagnosis of NIFTP. One specimen showed characteristics of micro NIFTP.

In terms of therapeutic management, all patients underwent total thyroidectomy. No radioactive iodine was administered. Patients who underwent total thyroidectomy were placed on hormone replacement therapy.

Clinical and biological monitoring was instituted. All patients were euthyroid at last follow-up, with no recurrence, but one case of medium-term complication such as dyspnoea, which required tracheostomy. Average follow-up was 18 months.

DISCUSSION

The term NIFTP was introduced in 2015 following a study by a working group of the Endocrine Pathology Society [1]. It is a neoplasm with a very low risk of malignancy and a very good prognosis. Its definitive diagnosis is made by pathological study, but it may be suspected by fine needle aspiration and molecular biology.

It accounts for 10% to 20% of all thyroid cancers currently diagnosed [2], and constitutes 50% to 75% of follicular encapsulated thyroid lesions (FVPTC) [3, 4].

Epidemiologically, NIFTPs mainly affect middle-aged women, with an average age of onset towards the end of the 4th decade and beginning of the 5th decade [5-8], a profile similar to that of other follicular thyroid tumours. As in our study, the mean age was 56 years, with a clear female predominance.

The incidence of NIFTP has increased dramatically in recent decades. However, their encapsulated nature and lack of capsular or vascular invasion are essential distinguishing features. These features are of major importance in avoiding aggressive management.

Thyroid nodules are the most common mode of manifestation. Pusztaszeri *et al*., reported that 61.6% presented with a single nodule, and 34.9% consulted for a multi-nodular goitre [6]. In our study, the discovery of a single thyroid nodule was the mode of presentation in 10% of cases, while goitre was the mode of presentation in 90% of cases.

Cervical ultrasound and fine needle aspiration (FNA) are valuable tools for suspecting NIFTP [9, 10]. However, the limitations of these tests in distinguishing NIFTP from other thyroid lesions require histopathological confirmation. It is a neoplasm with a very low risk of malignancy and a very good prognosis. Its definitive diagnosis is made by anatomopathological study. Histological diagnostic criteria include a complete study of the tumour capsule, absence of necrosis, follicular architecture and specific nuclear papillary features [1-11].

The genetic characteristics of NIFTP, notably RAS and BRAF mutations and gene rearrangements involving PPARG or THADA, reinforce the distinction between these tumours and classic papillary carcinomas. These genetic abnormalities could be used to refine diagnosis, although their use in routine clinical practice remains limited [1-15]. The future integration of molecular tests could improve diagnostic accuracy and optimise patient stratification.

Treatment of NIFTP consists of conservative surgery, i.e. lobectomy without treatment with radioactive iodine (RAI), thus avoiding unnecessary total thyroidectomy and hormone replacement therapy [3]. The absence of additional treatment with radioactive iodine is part of a strategy of therapeutic de-escalation, reducing iatrogenic risks while maintaining rigorous monitoring. This approach reflects a move towards personalised medicine, tailored to the patient's risk profile. However, this strategy requires multidisciplinary expertise and clear communication with patients to explain the indolent nature of NIFTP) [1-17].

Long-term studies are essential to assess the outcome of patients diagnosed with NIFTP, particularly in terms of residual risk of malignancy or adverse events. These data will be used to refine recommendations for clinicians and optimise management. Analysis of the psychological and economic impact of NIFTP reclassification would also be a relevant area of research to better understand the overall benefits of this approach [1-18].

CONCLUSION

The reclassification of EFVPTCs as NIFTPs marks a turning point in the management of indolent thyroid tumours. This entity makes it possible to avoid unnecessary overtreatment, while ensuring an excellent prognosis for patients. Advances in diagnostic techniques and conservative strategies will continue to play an essential role in optimising care. A better understanding of the biology of NIFTP and long-term clinical monitoring will consolidate these findings and inform future recommendations.

REFERENCES

1. Nikiforov, Y. E., Seethala, R. R., Tallini, G., Baloch, Z. W., Basolo, F., Thompson, L. D., ... & Ghossein, R. A. (2016). Nomenclature revision for encapsulated follicular variant of papillary thyroid carcinoma: a paradigm shift to reduce overtreatment of indolent tumors. *JAMA oncology*, *2*(8), 1023-1029.
2. Jung, C. K., Petit, D., & Lubin, J. H. (2014). L'augmentation de l'incidence du cancer de la thyroïde au cours des quatre dernières décennies s'accompagne d'une fréquence élevée de mutations BRAF et d'une forte augmentation des mutations RAS. *J Clin Endocrinol Metab*, 276-285.
3. Haugen, B. R. (2017). 2015 American Thyroid Association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer: what is new and what has changed?. *Cancer*, *123*(3), 372-381.
4. Tallini, G., Tuttle, R. M., & Ghossein, R. A. (2016). The history of the follicular variant of papillary thyroid carcinoma. *The Journal of Clinical Endocrinology & Metabolism*, *102*(1), 15-22.
5. Thompson, L. D. (2016). Ninety-four cases of encapsulated follicular variant of papillary thyroid carcinoma: a name change to noninvasive follicular thyroid neoplasm with papillary-like nuclear features would help prevent overtreatment. *Modern Pathology*, *29*(7), 698-707.
6. Pusztaszeri, M. P., Triponez, F., Meyer, P., & Sadowski, S. M. (2017). Noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP): Report of an institutional experience with 86 cases. *J Basic Clin Med*, *6*(1), 29-35.
7. Rosario, P. W., Mourão, G. F., Nunes, M. B., Nunes, M. S., & Calsolari, M. R. (2016). Noninvasive follicular thyroid neoplasm with papillary-like nuclear features. *Endocrine-Related Cancer*, *23*(12), 893-897.
8. Xu, B., Tallini, G., Scognamiglio, T., Roman, B. R., Tuttle, R. M., & Ghossein, R. A. (2017). Outcome of large noninvasive follicular thyroid neoplasm with papillary-like nuclear features. *Thyroid*, *27*(4), 512-517.
9. Yerly, S., Pralong, C. H., & Duc, P. Nodule thyroidien : la classification (Bethesda) au service des cliniciens. Institut Central (ICHV), hopital du Valais Sion: FMH Endocrinologie, Martigny, *Mai*, *17*(N5).
10. Pusztaszeri, M., Meyer, P., Bongiovanni, M., Triponez, F., Greloz, V., & Pache, J. C. (2011). Ponction à l'aiguille fine de la thyroïde: intérêts de l'évaluation cytologique immédiate. *Revue médicale suisse*, (303), 1491.
11. Seethala, R. R., Baloch, Z. W., Barletta, J. A., Khanafshar, E., Mete, O., Sadow, P. M., ... & Thompson, L. D. (2018). Noninvasive follicular thyroid neoplasm with papillary-like nuclear features: a review for pathologists. *Modern Pathology*, *31*(1), 39-55.
12. Zhao, L., Dias-Santagata, D., Sadow, P. M., & Faquin, W. C. (2017). Cytological, molecular, and clinical features of noninvasive follicular thyroid neoplasm with papillary-like nuclear features versus invasive forms of follicular variant of papillary thyroid carcinoma. *Cancer cytopathology*, *125*(5), 323-331.
13. Hung, Y. P., & Barletta, J. A. (2018). Guide d'utilisation d'un néoplasme thyroïdien folliculaire non invasif avec caractéristiques ncléaires de type papillaire (NIFTP) Histopathology, *Janvier*, *72*(1), 53-69.
14. Jiang, X. S., Harrison, G. P., & Datto, M. B. (2016). Young Investigator Challenge: molecular testing in noninvasive follicular thyroid neoplasm with papillary-like nuclear features. *Cancer Cytopathology*, *124*(12), 893-900.
15. Howitt, B. E., Paulson, V. A., & Barletta, J. A. (2015). Absence of BRAF V600E in non-infiltrative, non-invasive follicular variant of papillary thyroid carcinoma. *Histopathology*, *67*(4).

16. Hauch, A., Al-Qurayshi, Z., Randolph, G., & Kandil, E. (2014). Total thyroidectomy is associated with increased risk of complications for low-and high-volume surgeons. *Annals of surgical oncology*, *21*, 3844-3852.
17. Goffredo, P., Thomas, S. M., Dinan, M. A., Perkins, J. M., Roman, S. A., & Sosa, J. A. (2015). Patterns of use and cost for inappropriate radioactive iodine treatment for thyroid cancer in the United States: use and misuse. *JAMA internal medicine*, *175*(4), 638-640.
18. Ganly, I., Wang, L., Tuttle, R. M., Katabi, N., Ceballos, G. A., Harach, H. R., & Ghossein, R. (2015). Invasion rather than nuclear features correlates with outcome in encapsulated follicular tumors: further evidence for the reclassification of the encapsulated papillary thyroid carcinoma follicular variant. *Human pathology*, *46*(5), 657-664.