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Synchronous case of Hodgkin lymphoma and papillary thyroid carcinoma: A rare presentation of dual malignancy

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Abstract
Fine-Needle Aspiration Cytology (FNAC) is the primary diagnostic tool for thyroid nodules. Similarly, lymph node FNAC helps to reach the initial diagnosis of malignancy and to differentiate them from benign reactive lymph-nodes. We present a rare case of a 50-year-old female diagnosed with synchronous malignancies, including Hodgkin lymphoma (HL) and Papillary Thyroid Carcinoma (PTC). The 50-year-old female presented with high-grade fever, fatigue, and backache for 11 months. Imaging studies, including ultrasonography (USG) and contrast-enhanced computed tomography (CECT), revealed multiple lymph nodes in the pre-aortic, para-aortic, right common iliac, and external iliac regions. USG of the neck showed a TIRADS 4 lesion in the left thyroid lobe, bilateral cervical lymphadenopathy, and a left supraclavicular nodal mass. Fine needle aspiration cytology (FNAC) from the lymph nodes was done and diagnosis of Hodgkin Lymphoma was given. USG-guided FNAC from the thyroid lesion revealed high cellularity and findings were suspicious for Papillary Thyroid Carcinoma, (Bethesda Category V). The patient was referred to a higher oncology center where biopsy of the right inguinal node confirmed HL on histopathology and the thyroid FNAC findings were corroborated at the oncology center, confirming Bethesda Category V diagnosis. In this case report, diagnostic potential of cytopathological analysis of FNA specimens is highlighted in early and accurate diagnosis the rare synchronous dual malignancy of HL and PTC; hereby prompting timely appropriate patient management.

Keywords: FNAC, Hodgkin lymphoma, cytology, dual malignancy, papillary thyroid carcinoma

Introduction
In recent decades, the incidence of thyroid cancer has risen significantly, primarily due to enhanced detection methods and increased public awareness. Papillary thyroid carcinoma (PTC) is the most common type, accounting for about 90% of all thyroid cancer cases [1]. PTC is a well-differentiated neoplasm known for its favorable prognosis and high long-term survival rates [2]. On the otherside, Hodgkin lymphoma (HL) is a malignancy often found in lymphoid tissue [3].
Fine-Needle Aspiration Cytology (FNAC) is the primary diagnostic tool for thyroid nodules. The Bethesda System for Reporting Thyroid Cytopathology offers a standardized framework for interpreting FNA results, aiding in assessing malignancy risk and guiding clinical management. Similarly, lymph node FNAC helps to reach the initial diagnosis of malignancy and to differentiate them from benign reactive lymph-nodes [4].
Here, we present a rare case report of a 50-year-old female diagnosed with synchronous malignancies, including Hodgkin lymphoma and papillary thyroid carcinoma.

Case Report
A 50-year-old female presented to the Medicine Outpatient Department with complaints of high-grade fever, fatigue, and backache persisting for the past 11 months. Consecutively, she developed abdominal pain for past one month. Ultrasonography (USG) and Contrast-Enhanced Computed Tomography (CECT) of the abdomen revealed multiple small lymph nodes in the pre-aortic and para-aortic regions, as well as in the right common iliac and external iliac regions. Subsequently, she underwent a biopsy procedure from right iliac lymph-node, which suggested reactive lymphadenitis. However, a FNAC was done from right external iliac lymph nodes was reported to be highly suspicious of Hodgkin lymphoma.

Her hemogram revealed haemoglobin= 6.9g/dl, leucocyte count= 22,130/mm^3, DLC= P89 L07 E02 M01 and platelets count=5.9 lakh/mm^3. The Montoux test (Intradermal tuberculin test) was positive, and she was started on empirical Anti-Tuberculosis Treatment (ATT). Despite her completing the ATT treatment, her fever with fatigue and lymphadenopathy persisted.

A repeat USG of the whole abdomen and cervical region was done. The findings were as follows:

- USG neck revealed a TIRADS 4 lesion in the left lobe of the thyroid, along with bilateral cervical lymphadenopathy and a lymph nodal mass in the left supraclavicular region, and
- USG Abdomen revealed bilateral inguinal lymphadenopathy

A Positron Emission Tomography (PET) scan revealed avid 18F-fluorodeoxyglucose (FDG) nodules in left lobe thyroid and bilateral cervical and inguinal regions (Figure 1). The physician referred the patient for FNAC. Direct FNAC was performed on the right inguinal lymph node swelling, and both direct and USG-guided FNAC were done from the left cervical lymph node swelling. The smear from both sites revealed similar morphology with variation in cellularity, showing numerous atypical large mononuclear lymphoid cells dispersed singly. Some of these cells adhered loosely to blood vessels. The cells had enlarged, irregular, and lobulated nuclei with prominent nucleoli (1-2 per cell), along with moderate to abundant pale to bluish cytoplasm. Additionally, binucleate forms (Reed-Sternberg cells), multinucleate forms, and occasional mitotic figures were observed along with few plasma cells and focal reactive lymphoid cells (Figure 2). Immunohistochemistry on cell block sections revealed the tumor cells were positive for CD15 and CD30, and negative for CD20. A final diagnosis of Hodgkin lymphoma was rendered on FNAC.

Furthermore, USG-guided FNAC was performed from the thyroid swelling. The smears were highly cellular, showed follicular epithelial cells in sheets, syncytial clusters, groups, papillaroid fragments, and occasionally dispersed singly. These cells exhibited nuclear enlargement with moderate anisonucleosis, focal overcrowding, overlapping, granular chromatin, inconspicuous nucleoli, and moderate to abundant pale to finely granular cytoplasm (oncocytic cells). Few intranuclear pseudoinclusions and rare intranuclear grooving were also seen. The background was hemorrhagic, with areas of thin colloid (Figure 3). Overall cytomorphological features were highly suspicious for Papillary Thyroid Carcinoma, predominantly with oncocytic cells and were categorized as Bethesda System for Reporting Thyroid Cytopathology, Category V (Suspicious for Malignancy).

On the basis of report of dual malignancy on FNAC findings, the patient was referred to higher oncology centre and a repeat biopsy of the right inguinal lymph node was performed. The histopathological examination was done with immunohistochemistry, revealed atypical cells with positive immunoexpression of CD15 and CD30 and negative for CD20, CD3 and LMP1 (Latent membrane protein-1). The histopathological diagnosis of Hodgkin lymphoma was made. For thyroid swelling, the FNAC slides were reviewed at oncology centre and were found compatible with aforementioned diagnosis. After multidisciplinary discussion, the patient was referred to the Department of Hematology to receive 4 cycles of chemotherapy followed by involved-site radiotherapy according to 2018 ESMO Clinical Practice Guidelines. The patient showed resolution of HL and was taken up for Thyroid tumor resection. Post total thyroidectomy specimen confimed the diagnosis of papillary thyroid carcinoma. The patient is on follow-up and disease-free.

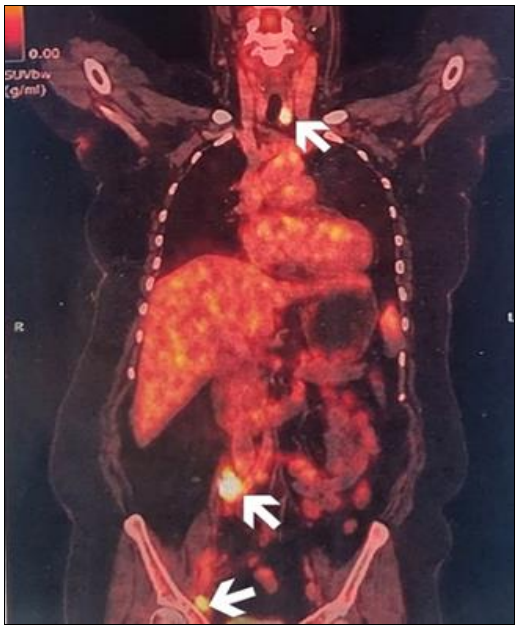

Fig 1: PET scan of the patient showing FDG avid lesion in thyroid, Para-aortic and inguinal regions (white arrows)

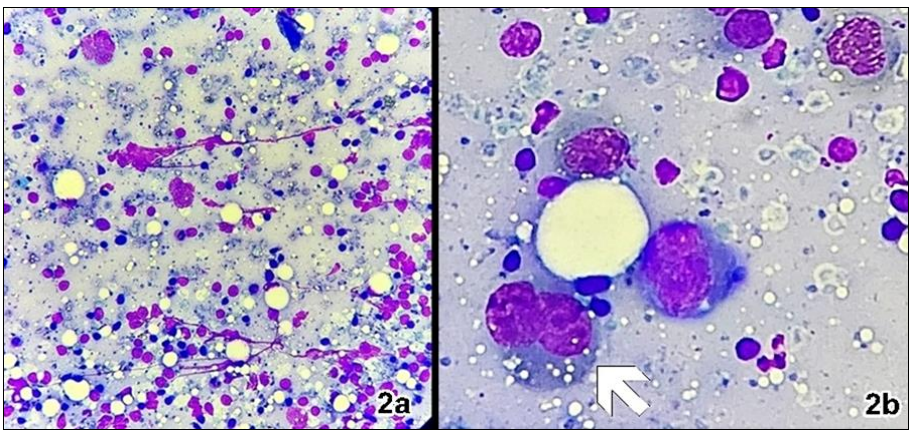

Fig 2: 2a-Cytological smear of right inguinal lymph node showing features suspicious of Hodgkin lymphoma (Giemsa stain, 100X); 2b *Arrow* Reed-Sternberg cell (white arrow, Giemsa stain, 400X)

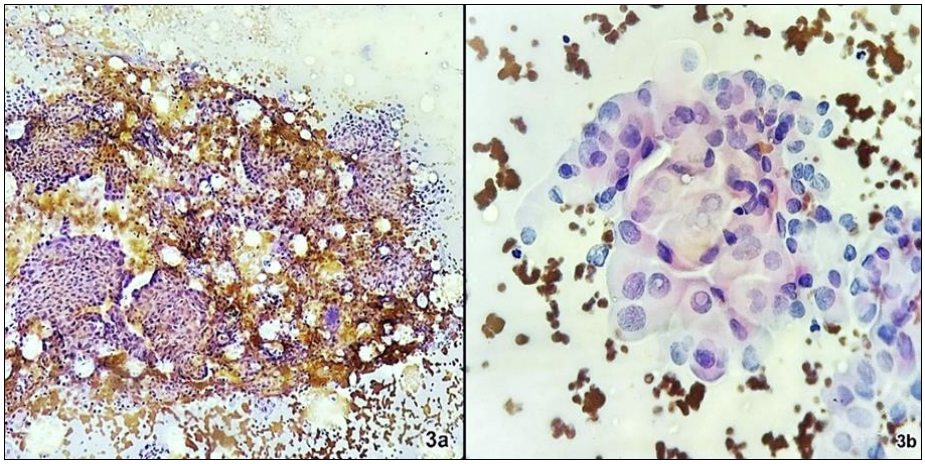

Fig 3: 3a-Thyroid FNA cytological smear showing papillaroid architecture of tumor (Papanicolaou stain, 40X). 3b-Thyroid FNA cytological smear showing intranuclear cytoplasmic inclusion in a papillaroid cluster (Papanicolaou stain, 400X)

Discussion

The cytological diagnosis of HL can be challenging, particularly when Reed-Sternberg (RS) cells are scarce [5]. Papillary thyroid carcinoma also has comprehensive cytomorphological features [6]. In the current case report, lymph-nodes from bilateral cervical and inguinal region were cytologically examination to exclude the possibility PTC metastases also. All lymph-node concurred with diagnosis of Hodgkin lymphoma. To enhance diagnostic accuracy, it is crucial for cytopathologists to be aware of these pitfalls and consider clinical correlations alongside cytological findings. In cases of dual malignancy, HL can also be further confirmed by immunocytochemistry on cell block from FNAC.

In review of literature, there were three cases of synchronous PTC and HL. Age of the patients ranged from 17years to 49 years. The present case had female patients aged 50 years. These cases included two with incidental finding of concurrent HL in patient of PTC and other two cases with incidental finding PTC in patient operated for HL.[7-9] Out of these, initial assessment and impression of dual malignancy on cytology is showcased by single case report only.[9] The present case report also reinforced upon the diagnostic utility of meticulous cytological assessment of FNA specimens for early diagnosis of synchronous malignancy and thereby prompting further management.

While a genetic origin could potentially explain simultaneous occurrence of PTC and HL, no common mutations have been identified to date [10]. In developing the treatment plan for this patient with dual malignancy, the management of Hodgkin lymphoma (HL) was prioritized over papillary thyroid carcinoma (PTC) due to HL's more aggressive nature. The chosen sequence involved administering ABVD adjuvant chemotherapy and radiotherapy for HL, followed by surgical resection of the thyroid for PTC.

In this case report, diagnostic potential of cytopathological analysis of FNA specimens is highlighted in diagnosing the rare synchronous dual malignancy of HL and PTC. Further research is essential to elucidate the molecular mechanisms and etiopathogenesis underlying the synchronous occurrence of such multiple malignancies.

Conflict of Interest

Not available

Financial Support

Not available

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