Case Report

DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20205081

Fluorodeoxyglucose positron emission tomography-computed tomography base response assessment in primary thyroid lymphoma

Tarun Kumar Jain^{1*}, Anushree Punia², Shikha Dhal², Guman Singh², Hemant Malhotra³, Ankur Punia³, Naveen Gupta³

¹Department of Nuclear Medicine, ²Department of Radiotherapy, ³Department of Medical Oncology, Mahatma Gandhi Medical College and Hospital, Jaipur Rajasthan, India

Received: 15 October 2020 Accepted: 18 November 2020

*Correspondence:

Dr. Tarun Kumar Jain, E-mail: tarun4891@gmail.com

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ABSTRACT

Isolated primary thyroid lymphoma and lesion in the thyroid gland presenting as a lymphoma, both are uncommon entities. This subgroup of thyroid malignancies is managed in different ways as compared to common thyroid malignancies. A 63-year-old male diagnosed as non-Hodgkin's lymphoma of the thyroid gland underwent for F-18 fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT). It revealed isolated FDG avid soft tissue mass in left lobe of thyroid gland. After two and six cycles of chemotherapy, PET-CT was perfomed and response assessed in Deauville scores.

Keywords: Primary thyroid lymphoma, F-18 fluorodeoxyglucose positron emission tomography-computed tomography, Deauville score

INTRODUCTION

Isolated primary thyroid lymphoma and lesion in the thyroid gland presenting as lymphoma, both are rare entities. It's accounting for<5% of thyroid malignancies with<2% of extranodal lymphomas.^{1,2} Womans are quite common affected as compare to man (2-8:1). In the thyroid tissue, both B cell and T cell lymphoma have been described.

In the thyroid lymphoma, diffuse large B-cell lymphoma (DLBCL) is most common followed by MALToma.^{3,4} High grade DLBCL even though very aggressive but shows a very good response to chemotherapy with a very good prognosis in limited forms of disease.⁴ There are few studies in the published literature that describe the role of 18-F FDG PET-CT in thyroid lymphoma for staging as well as response assessment.⁵⁻¹¹

CASE REPORT

A 63 years old male presented with incidentally detected left sided neck swelling for 20 days. The swelling was nonpainful, non-tender and showing movement on deglutination and tongue protrusion. There was no past history of the thyroid illness and radiation exposure. On local examination of neck, there was an elongated (~4.0×3.0×5.0cm) large swelling in left sided cervical region in paramedian plane. Swelling was fixed (non-movable up-down and side by side) and lower margin was non-accessible. There were no other palpable cervical, axillary and supraclavicular swellings.

On laboratory examination, triiodothyronine (T3) 90 ng/dl (70.00-204.00), tetraiodothyronine (T4) 5.4 μ g/dl (4.60-12.50) and thyroid stimulating hormone (TSH) 2.7 μ IU/ml (0.35-5.50), anti-thyroid peroxidase antibody (anti TPO) 12 U/ml (<30U/ml), thyroglobulin (Tg) 1.0 ng/dl (<10 ng/ml), calcitonin 1.0 pg/dl (<10 pg/ml), and

parathyroid hormone 12.8 pg/ml (10-65 pg/ml) were within normal limits.

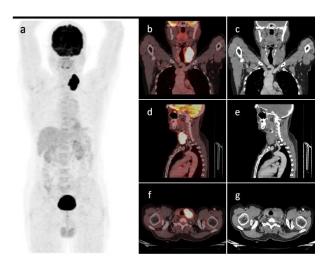


Figure 1: F-18 FDG PET-CT MIP image (a) shows focal increased tracer uptake in the left cervical region. Corresponding coronal, sagittal and transaxial PET-CT and CT images (b-g) reveal intensely FDG avid heterogeneously enhancing soft tissue mass (SUV max 29.4; ~4.4×4.0×7.0cm) in the left lobe of thyroid gland with mediastinal extension.

USG neck revealed a soft tissue mass with increased blood flow in left lobe of thyroid gland and FNA of mass showed high grade NHL (Non-Hodgkin's lymphomadiffuse large B cell lymphoma (DLBCL) CD 20 Positive. Baseline 18F FDG PET-CT revealed FDG avid soft tissue mass (SUV max 29.4; ~4.4×4.0×7.0 cm) in the left lobe of thyroid gland with mediastinal extension (Figure 1).

Patient received 2 cycles of the chemotherapy (R-CHOP) and interim PET –CT showed significant decrease in size and extent of FDG avidity in the mass (SUV max 2.6; ~1.2×1.0×3.2cm) and Deauville score was reported III. After completion of the 6 cycle of chemotherapy, PET-CT revealed low grade FDG avid minimal soft tissue density in the left paralaryngeal region (~0.5×0.6×1.0cm; SUV max 1.6) and Deauville score was reported II.

The comparison of the all three PET-CT scan is compiled in tabular Table 1 and figure form (Figure 2 and 3).

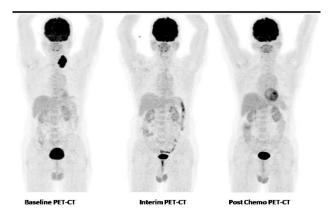


Figure 2: Comparative analysis of the baseline, interim and completion PET-CT maximum intensity projection (MIP) images.

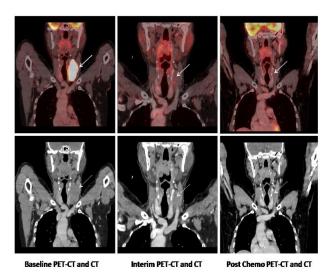


Figure 3: comparative analysis of the baseline, interim and completion coronal PET-CT and CT images.

For the minimal residual disease in cervical region, patient was scheduled for radiotherapy to neck region. After 3 months of the radiotherapy, there was no lesion in the cervical region on ultrasound imaging and clinically.

Table 1: Comparative analysis of the baseline, interrim and completion PET-CT in tabular form.

PET -CT	Primary lesion	Mediastinal blood pool SUVmax	Liver SUVmax	Comments
Baseline PET-CT	~4.4×4.0×7.0 cm; SUV max 29.2	1.7	3.1	Mass with mediastinal extension
Inter rim PET-CT	~1.2×1.0×3.2 cm; SUV max 2.6	1.4	3.0	Residual mass; Deauville score-3
Post Chemo completion PET-CT	~0.5×0.6×1.0 cm; SUV max1.6	1.7	3.3	Residual tissue Deauville score-2

DISCUSSION

Most of the thyroid swellings are treated with the help of surgery in various forms but in thyroid lymphoma, there is no need for removal of the thyroid gland. The effective mode of the treatment in primary thyroid lymphoma is medical management.¹² Primary thyroid lymphoma is a lymphomatous process involving the thyroid gland without contiguous spread or distant metastases from other areas of involvement at diagnosis. In the management of the lymphoma, Deauville five-point scale incorporating the Deauville criteria (DC) is routinely suggested for quantitative response assessment in Hodgkin as well as non-Hodgkin lymphomas in 18-F FDG PET-CT.¹³ In DC, FDG uptake is categorized in relation to the reference regions of normal mediastinum and liver. Interim treatment assessment is very necessary. Based on early treatment assessment one could modify treatment; If it is not successful, we can escalate therapy or change therapy or selectively add the doses (radiotherapy). If treatment is successful then we can deescalate therapy or stop the therapy early. These changes provide enormous benefits for the patient like improved tumor control, reduced side effects, and costs. To my best knowledge this is a first case report in primary thyroid lymphoma, which use the Deauville fivepoint scale for response assessment of the thyroid lymphoma.

CONCLUSION

It is essential to give special care towards such rare sites of the lymphomas and different nature of the thyroid swellings. In particular for thyroid lymphoma, the management is different from other common thyroid malignancies. With the help of proper initial and interim evaluation of the these type of thyroid lymphoma, we can provide better management.

Funding: No funding sources Conflict of interest: None declared Ethical approval: Not required

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Cite this article as: Jain TK, Punia A, Dhal S, Singh G, Malhotra H, Punia A, Gupta N. Fluorodeoxyglucose positron emission tomography-computed tomography base response assessment in primary thyroid lymphoma. Int J Otorhinolaryngol Head Neck Surg 2020;6:2313-5.