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CASE REPORT

Radiographic pattern of extra-nodal non-Hodgkin's lymphoma

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ABSTRACT

Diffuse large B-cell lymphoma is a Non-Hodgkin's lymphoma (NHL), which has diverse manifestations. Extra-nodal NHL is extremely rare entity. Diagnosis, staging and treatment plan of the patient depends on the clinical findings and radiographic investigations. Positron emission tomography computed tomography (PET CT) scan helps in localization of the lesion and also for posttreatment restaging. Here we are presenting a case report of a 21-year-old patient with diffuse large B-cell lymphoma. This case report highlights the importance of imaging for localization of the lesion and posttreatment evaluation of the lesion.

Key words: Diffuse large B-cell lymphoma, extra-nodal, non-Hodgkin's lymphoma, positron emission tomography computed tomography scan

Introduction

Non-Hodgkin's lymphomas (NHL) are a heterogeneous group of lymphoproliferative malignancies which can involve both lymph nodes and lymphoid organs, as well as extra-nodal organs and tissues [1]. Common primary extra-nodal sites of lymphomas include liver, soft tissue, dura, bone, stomach, intestine and bone marrow [2,3]. Primary malignant lymphomas of the paranasal sinus account for approximately 8% of paranasal malignancies and only 2% of all primary extranodal NHL [4]. The present report is of a 21-year-old male patient who reported with swelling on the hard palate.

Case Report

Clinical presentation

A 21-year-old male patient reported with the chief complaint of swelling in a hard palate since 1 1/2 months. The swelling was asymptomatic and was gradually increasing in size since then. Patient gave no history of fever or pain. On examination extra-orally diffuse swelling was present on right infraorbital region. On palpation, swelling was firm and nontender. Intra-orally a swelling of 2 cm × 2 cm in size extending from 14 to 16 was noted palatally [Figure 1]. It was a soft and fluctuant, nontender swelling with overlying mucosa normal. 14 and 15 presented with deep pocket palatally and Grade I mobility in 14 and Grade II mobility with 15.

Patient was advised to undergo routine hematological investigations. Except raised ESR (110 mm/h) other hematological investigations were normal. Blood glucose levels, serum urea, and creatinine levels were estimated to be in normal range. Liver and renal function tests showed no abnormalities. He was seronegative for HIV and hepatitis B surface antigen.

Clinically differential diagnosis was given of minor salivary gland tumor, carcinoma of maxillary sinus.

Radiographic investigations

Patient was subjected to radiographic investigations.

Plain film radiographic findings

An intra-oral periapical radiograph (IOPA) was taken, which showed severe irregular bone loss in 14 and 15 region with discontinuity in the anterior part of floor of right maxillary sinus [Figure 2]. The patient was subjected to orthopantomogram (OPG). OPG showed discontinuity in floor of right maxillary sinus with opacification in the sinus cavity [Figure 3]. Patient was advised to undergo computed tomography (CT) scan examination to study the exact extent of the lesion.

Computed tomographic findings

Computed tomography scan revealed a lesion of soft tissue density along the lateral wall of right maxillary sinus measuring about 28 mm × 25 mm. A homogeneous mass was seen causing destruction of the floor, anterior and posterior-lateral walls of right maxillary sinus and extending into the oral cavity on the hard palate through the destructed floor of the sinus. Destruction of zygoma of same side was noted [Figure 4b]. Other sinuses and nasal cavity appeared normal. No lymphnode involvement.

Brain CT did not show any CNS involvement.

Whole body positron emission tomography computed tomography scan findings

Fluorine-18 fluoro-2-deoxy-D-glucose (FDG) avid soft tissue mass noted in inferior aspect of right maxillary sinus with

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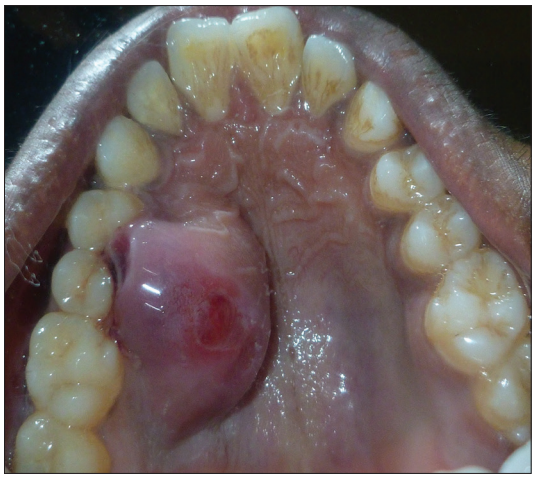

Figure 1 Intraoral swelling seen on right side of hard palate

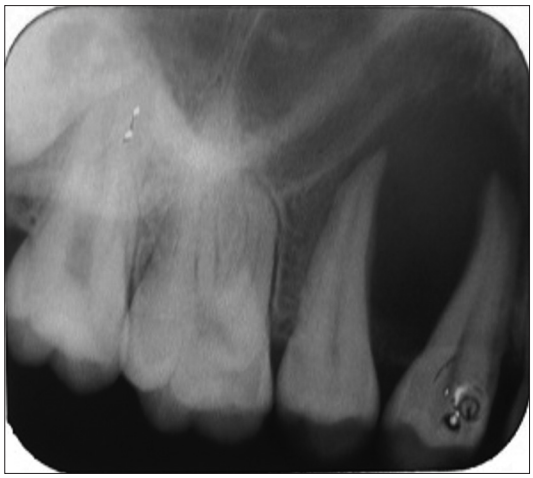

Figure 2 An intra-oral periapical radiograph is showing radiolucency in periapical area of 14 and 15 region extending up to cervical area of the teeth. Intact cervical crest can be appreciated

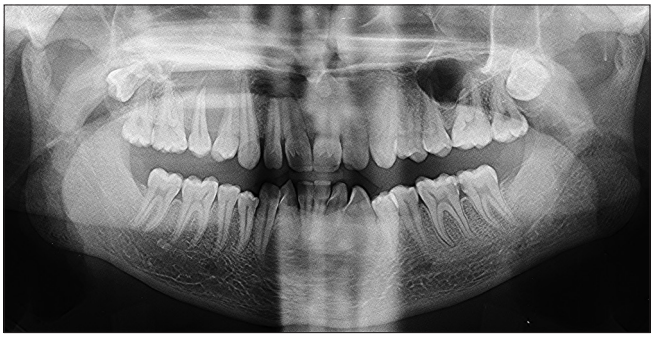

Figure 3 Orthopantomogram is showing destruction of the floor of the maxillary sinus and irregular radiolucency in 14 and 15 region

involvement and destruction of anterior and inferior wall and hard palate with measuring max standardized uptake value (SUV) 49 mm × 15.6 mm, max SUV 26.82.

Another FDG avid soft tissue mass noted in a superior aspect of right maxillary sinus involving posterio-lateral wall extending into the right orbital cavity-measuring max SUV 22.7 mm × 20.6 mm, max SUV 26.51.

Fluoro-2-deoxy-D-glucose uptake noted in soft tissue nodule (node) anterior to symphysis menti 7 mm, max SUV 6.5. Rest of the scan was unremarkable revealed physiological tracer uptake [Figure 4a].

Based on the above radiographic findings radiographic diagnosis was given to be a neoplastic lesion involving the right maxillary sinus and the symphysis menti.

Other investigation

Bone marrow biopsy

Showed mildly hypocellular uninvolved bone marrow. Cerebrospinal fluid sample was negative for malignancy.

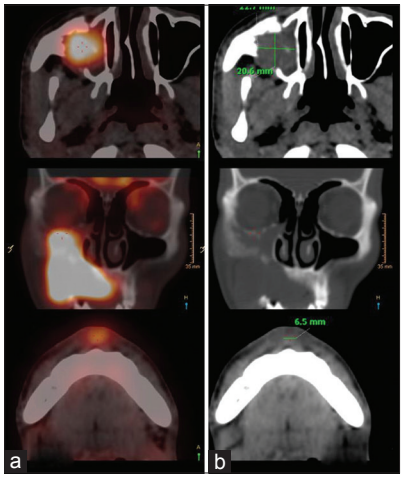

Figure 4 (a) Positron emission tomography computed tomography scan images showing hot spot on right side involving maxillary sinus, zygomatic arch, and mental region (b) CT scan images are showing destruction on the anterior and anterolateral wall of right maxillary sinus and zygomatic arch

Histopathological findings

Biopsy was done of the lesion from the hard palate region, which gave the final diagnosis of high-grade diffuse large B-cell lymphoma [Figure 5]. On immunohistochemistry, the tumor cells were positive for CD20, Bcl-2 and focally for leukocyte common antigen while negative for CD3, CD10, CD138.

Final diagnosis of NHL of diffuse large B-cell type Stage IV AE according to the Ann Arbor staging system was rendered. Patient was referred to cancer institute where 6 cycles of chemotherapy regimen constituting of cyclophosphamide, doxorubicin, vincristine and prednisone (CHOP) was planned followed with 25 cycles of radiotherapy. Posttreatment

reduction in the swelling had occurred [Figure 6]. After 6 cycles of chemotherapy positron emission tomography (PET) CT scan was repeated which showed no abnormal FDG uptake in the right maxillary sinus and symphysis menti region [Figure 7].

Discussion

Non-Hodgkin's lymphoma is lymphoproliferative disorder, which is classified according to the Revised European American Lymphoma/World Health Organization (REAL/WHO) system as: B-cell malignancy, T-cell/natural killer malignancy and Hodgkin's lymphoma. NHL stands second in neoplasms of the head and neck region and third among the malignant neoplasm after squamous cell carcinoma and salivary gland neoplasm [5,6]. Head and neck is the second common region for extra-nodal lymphoma to occur after gastro intestinal tract [7]. The most commonly affected site in head neck region is Waldeyer's ring [6,8].

Cases have been seen associated with AIDS and in few cases it is seen as the first sign of AIDS but in our case it was nonreactive [9]. NHL occurs in age range of 50–60 years with male predominance[10], but in our case it was a young patient of 21-year-old. When oral lymphomas are present, they are soft in consistency and with ulcerated overlying surface. If bone involvement is present then tooth mobility due to bone loss occurs [11]. Our case showed Grade 1 mobility with 14 and Grade II mobility with 15 due to bone destruction caused by the lesion.

Use of cross-sectional imaging has greatly helped in early diagnosis, staging and for monitoring the disease. However, the CT scan does not have the sensitivity to diagnosis small metastasis and early recurrence and this drawback can be overcome by PET. However due to lack of spatial resolution and inability to localize anatomical landmarks PET is combined with CT so that a PET CT provides the benefits and overcomes the drawbacks of both these modalities [12]. PET is a functional imaging modality in which 18F-FDG is most commonly used. FDG is an analogue of glucose with higher uptake in cells with more glucose metabolism. Hence, the neoplastic cells have higher uptake in comparison to surrounding cells. FDG gets phosphorylated in cells to FDG-6 phosphate, which is entrapped into the cells [12]. It decays by emission of a positron, which undergoes mutual annihilation with an electron resulting in the emission of gamma rays. These gamma rays are detected by the PET scanner.

Positron emission tomography is sensitive for more aggressive tumor because of the rapidly dividing cells. Involvement of lymph nodes, which are not enlarged and active involvement of enlarged nodes, can be confirmed by PET, which is a drawback of CT scan [13]. PET CT is useful for restaging of disease postchemotherapy.

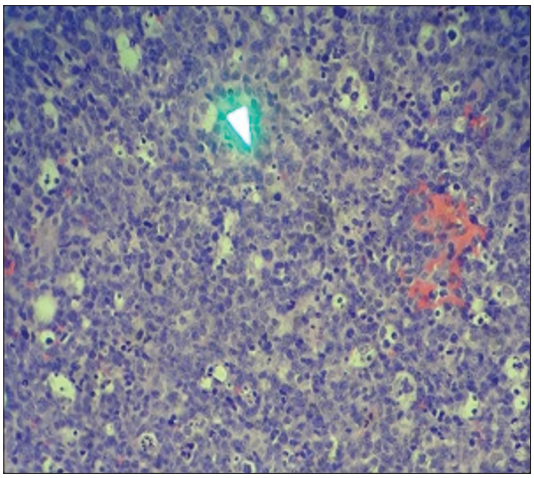

Figure 5 Histopathological slide is showing high-grade lymphoma

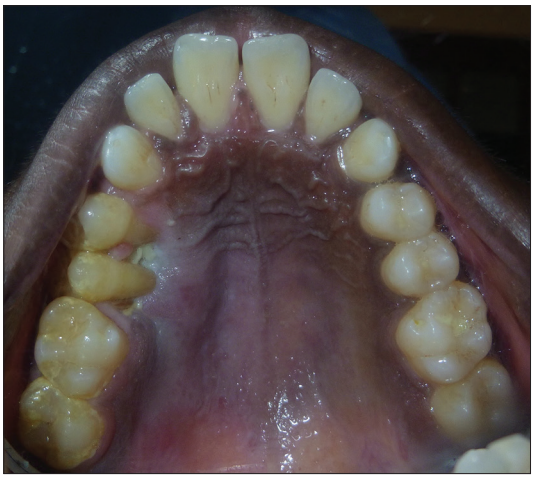

Figure 6 Recall intraoral view of the patient after chemotherapy and radiation therapy, showing reduction in swelling

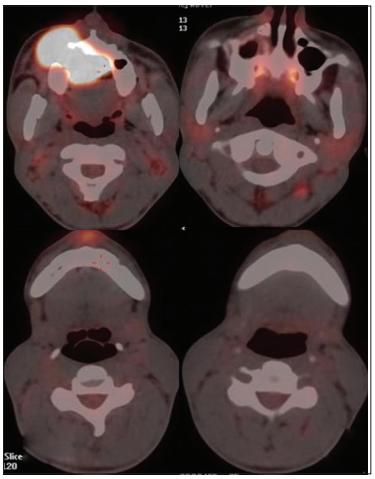

Figure 7 Comparison of the positron emission tomography computed tomography scan images pretreatment and posttreatment. Reduction in the hot spot can be appreciated

However the PET also has a few drawbacks, for example, false negative results can occur in tumors with low metabolic rate, false positive results are seen in cases like sarcoidosis, tuberculosis, fungal infections, pyogenic abscess [14,15].

Conclusion

The PET CT has the dual advantage of functional imaging provided by the PET and spatial resolution and exact localization in three dimensions provided by the CT. Thus, PET CT plays a crucial role in diagnosis, staging, treatment planning and the posttreatment response of high-grade lymphomas and obviously of other malignant tumors.

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Authors' Contributions

All authors contributed to the patient care, management and drafting the manuscript. All authors have read and approved the final version.

Consent

The authors certify that a written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal.

Competing Interests

The authors declare that they have no competing interests.

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