



# 'Misdiagnosis of diffuse large B-cell lymphoma in the maxillary sinus as a dental abscess'

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**Introduction:** Diffuse large B-cell Lymphoma (DLBCL) is a heterogeneous group of malignant tumors with diverse prognoses, histological appearances, and clinical symptoms. While it commonly affects lymphoid tissues, its occurrence in the nasal cavity and paranasal sinuses is rare and poses significant diagnostic challenges.

**Case Presentation:** The authors present a case of a 53-year-old man with a history of testicular non-Hodgkin lymphoma treated 5 months prior. He presented with symptoms initially misdiagnosed as a dental abscess, which was later identified as DLBCL in the maxillary sinus.

**Discussion:** The etiology of primary lymphoma in the oral region remains unclear. Due to its rarity, specific prognostic factors, and optimal treatment strategies are not well-established. This case highlights the diagnostic challenges and underscores the importance of considering lymphoma in the differential diagnosis of nonresponsive dental abscesses.

**Conclusion:** This case underscores the importance of thorough investigation in patients with nonresponsive dental abscesses. Early identification and appropriate management of DLBCL in uncommon sites require heightened clinical awareness and interdisciplinary collaboration. The optimal treatment approach remains debated and warrants further research.

**Keywords:** dental abscess, diffuse large B-cell lymphoma, maxillary sinus, misdiagnosis, non-Hodgkin lymphoma, oral oncology

## Introduction

Diffuse large B-cell Lymphoma (DLBCL) is the most prevalent type of non-Hodgkin lymphoma, primarily affecting older males, and accounts for 30–40% of newly reported cases. It is classified into nodal and extranodal types based on its primary location. Nodal DLBCL often presents as painless lymphadenopathy, whereas extranodal DLBCL can manifest with varied symptoms depending on the site of local invasion<sup>[1]</sup>.

Extranodal DLBCL can affect various sites, with the gastrointestinal system being the most common, followed by the head and neck area. The diverse clinical presentations and histological

## HIGHLIGHTS

- Diffuse large B-cell Lymphoma (DLBCL) is an uncommon malignancy of the nasal cavity, paranasal sinuses, and nasal cavity.
- Dentists should conduct further investigations into non-responsive dental abscesses. When they did not respond to traditional treatment.
- Researchers should conduct more studies on the optimal treatment approach for this tumor.

morphology of DLBCL complicate diagnosis and prognosis. According to the Ann Arbor staging system, Waldeyer's ring in the oral cavity is considered a nodal site, while other locations are extranodal. Though extranodal NHL in the oral region is rare, DLBCL is the most prevalent form<sup>[1,2]</sup>.

'In the head and neck region, the maxillary sinus is the most typical site for extranodal DLBCL, often presenting as a soft tissue mass that can significantly destroy bone. Symptoms such as facial swelling, nasal obstruction, bloody discharge, and rhinorrhea are nonspecific and can be mistaken for benign inflammatory diseases, leading to delayed diagnosis'<sup>[2]</sup>.

Given the nonspecific symptoms and the potential for misdiagnosis, it is crucial to consider extranodal DLBCL in differential diagnoses, especially in cases unresponsive to standard treatments. This report discusses a patient with DLBCL in the maxillary sinus initially misdiagnosed as a dental abscess

## Case presentation

A 53-year-old man with a history of restricted testicular non-Hodgkin lymphoma 5 months before, presented to the dental

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**Figure 1.** A panoramic radiography displayed opacification of the right maxillary sinus.

outpatient department with asymptomatic tumefaction in the middle third of the right side of the face, with no improvement following the incorrect prescription of antibiotic therapy by another medical expert, after being misdiagnosed as a dental abscess. Our patient's primary complaint during the anamnesis was the existence of an intraoral tumefaction, which made it challenging to employ a full denture. In addition, the patient reported having coryza, rhinorrhea, and weeping in the right eye.

Asymmetry changes to the cervical lymph nodes were not seen. Upon intraoral examination, the right buccal mucosa revealed a

tumefaction that extended from the anterior region to the maxilla's tuberosity covered by intact mucosa.

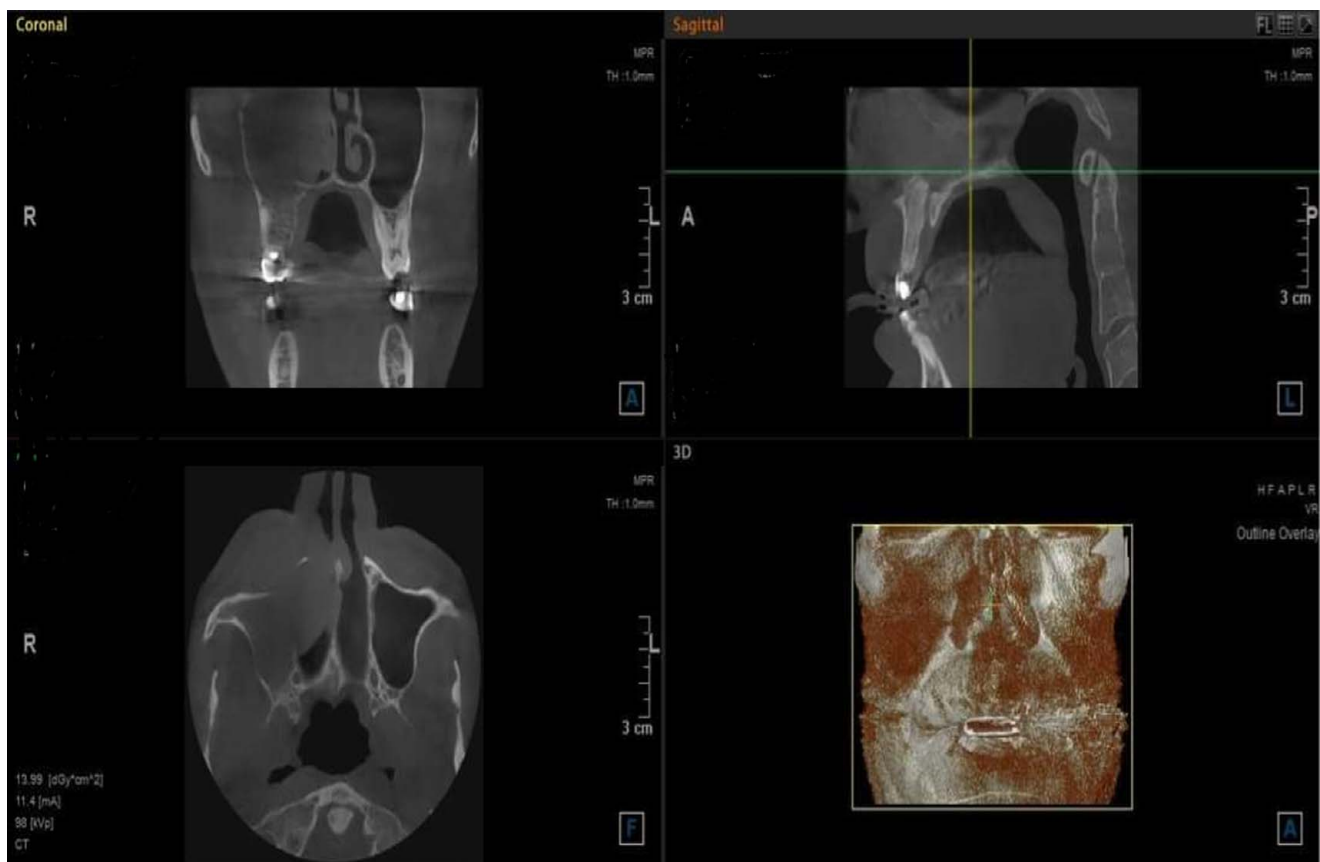
A panoramic radiography was done and displayed opacification of the right maxillary sinus (Fig. 1).

A computed tomography (CT) scan revealed a heterogeneous mass measuring ~27–40 mm within the right maxillary sinus, characterized by nonuniform enhancement suggestive of erosion and disruption of the anterior wall of the right maxillary sinus. Additionally, it extends into the infraorbital fissure and erodes the medial wall, with an extension into the right nasal cavity (Fig. 2).

An incisional biopsy was performed at the intraoral tumefaction, and the specimen was sent for histopathological analysis. Immunohistochemical staining revealed strong positive staining results for a combination of CD20 positive differentiation cells, LCA positive cells, equivocal CD10 positivity, and negative.

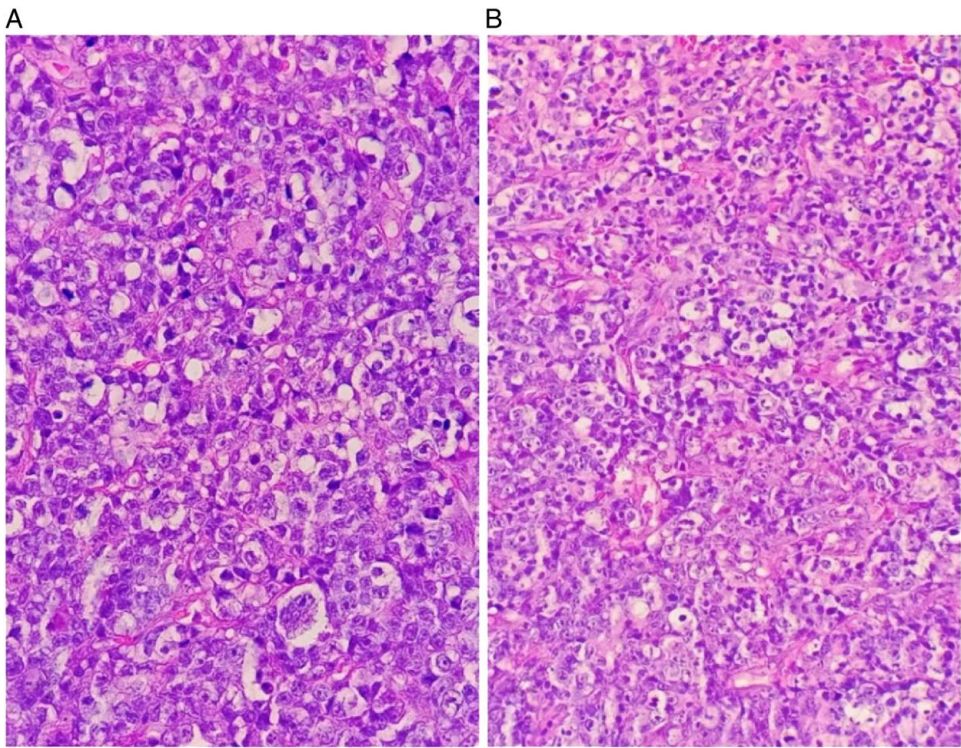
Clusters of large atypical lymphocytes with irregular nuclei with uneven chromatin and small to large nucleoli are visible in the sample. Some cells show multilobulated nuclei. Mitosis and apoptotic bodies are evident (Fig. 3). Strong and diffuse membranous positivity of CD20 within the cancerous cells (D): Diffuse membranous positivity of LCA within the cancerous cells (Fig. 4). Equivocal CD10 positivity was confirmed by immunohistochemical staining (Fig. 5) a final diagnosis of diffuse large B-cell lymphoma was made.

The patient received three cycles of Rituximab-CHOP chemotherapy followed by an additional three cycles after a 2-month

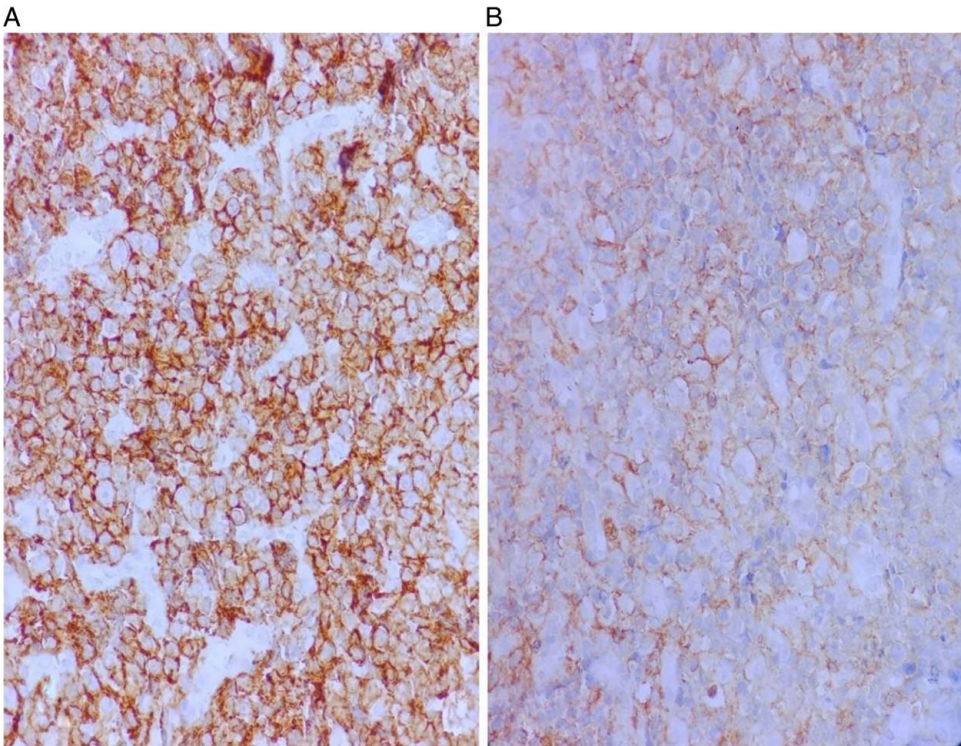


**Figure 2.** A computed tomography (CT) scan revealed a heterogeneous mass measuring ~27–40 mm within the right maxillary sinus.



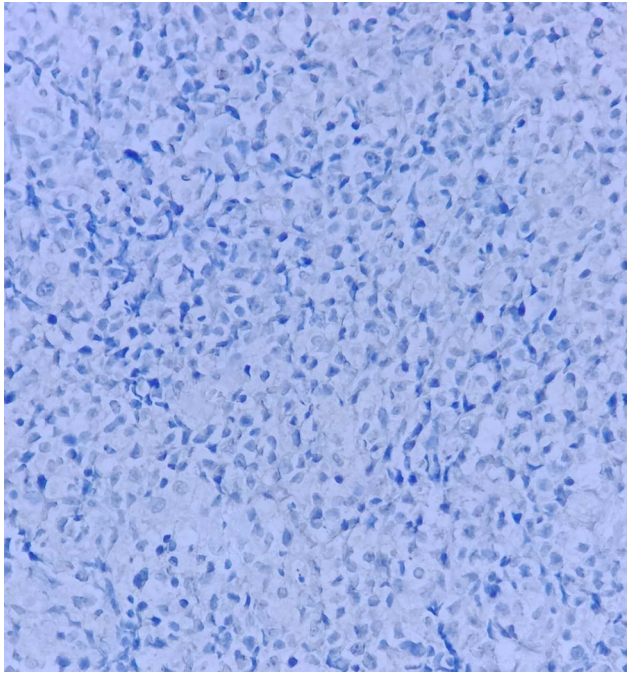


**Figure 3.** Histopathological images of the biopsy sample from the right maxillary sinus mass. Clusters of large atypical lymphocytes with irregular nuclei with uneven chromatin and small to large nucleoli are visible in the sample. Some cells show multilobulated nuclei. Mitosis and apoptotic bodies are evident. Hematoxylin and eosin staining (A magnification A  $\times 400$  and B  $\times 200$ ).



**Figure 4.** Immunohistochemical staining ( $\times 400$  magnification) revealed: A: strong and diffuse membranous positivity of CD20 within the cancerous cells. B: diffuse membranous positivity of LCA within the cancerous cells.





**Figure 5.** Equivocal CD10 positivity was confirmed by immunohistochemical staining (x 400 magnification).

interval with radiation therapy to the maxillary sinus. The patient presented to the emergency department with fatigue and general weakness. The evaluation revealed anemia, and the patient received a transfusion of three units of blood. However, after a few months, the patient passed away.

## Discussion

Extranodal NHLs constitute 20–30% of NHL cases, with the gastrointestinal system and head and neck regions being the most commonly affected sites. Oral and paroral lymphomas account for ~2.5% of all lymphoma cases. DLBCL and extranodal natural killer/T-cell lymphoma (ENKTL) are the most frequent subtypes in the sinonasal region<sup>[3]</sup>.

The most frequent subtypes of lymphomas in the sinonasal region are diffuse large B-cell lymphoma (DLBCL) and extranodal natural killer/T-cell lymphoma (ENKTL). Additionally, both sinonasal DLBCL (SN-DLBCL) and sinonasal ENKTL (SN-ENKTL) are commonly detected in the localized stage, accounting for 70–90% of cases<sup>[4]</sup>. They are usually submucosal, and differ from squamous cell carcinoma on gross appearance, which is usually ulcerative<sup>[5]</sup>. In our patient, the DLBCL in the maxillary sinus was initially misdiagnosed as a dental abscess, delaying the start of appropriate treatment. This highlights the critical need for thorough differential diagnosis in cases of nonresponsive dental abscesses.

The mean patient age was  $67.9 \pm 15.9$  years, with males making up 55.4% of the group according to a study by Varelas *et al.*<sup>[6]</sup>. In this population-based study, it was found that among Caucasians and African Americans, the maxillary sinus is the predominant primary site, whereas for Asian/Pacific Islanders, the nasal cavity emerges as the most prevalent location<sup>[6]</sup>.

Our patient was a 53 Asian man with a negative family history.

NHL may manifest as epistaxis, nasal blockage, rhinorrhea, vision abnormalities, bloody discharge, hearing loss, facial swelling, and traditional B-symptoms like fever and weight loss within the nasal cavity and paranasal sinuses, with high morbidity<sup>[6]</sup>.

It is unknown what causes primary lymphoma of the mouth region. A few reports of oral lymphomas have been linked to acquired immune deficiency syndrome (AIDS); in certain circumstances, it may even be the initial sign of AIDS<sup>[7]</sup>. In our instance, the patient tested negative for HIV and the tumor may not be primary but a metastasis as the patient presented in an advanced stage.

Radiological imaging is crucial for evaluating tumor spread, bone damage, and determining biopsy sites. CT scans are particularly effective in detailing bone structures and identifying mucosal thickening. Lymphoma can cause generalized bone destruction, particularly in the maxillary sinuses<sup>[7]</sup>.

DLBCL in the paranasal sinuses carries a high risk of CNS involvement due to its proximity to the central nervous system. Rituximab-based regimens have been shown to reduce CNS failure rates. A comparatively higher likelihood of central nervous system involvement is linked to advanced stage, multiple extranodal lesions, and involvement of specific sites, such as the testis<sup>[8]</sup>. Surgical excision is generally limited to biopsy purposes, as it has not demonstrated significant therapeutic benefit<sup>[6]</sup>.

Despite aggressive treatment, our patient succumbed to the disease, underscoring the poor prognosis associated with advanced-stage DLBCL involving multiple extranodal sites. This case emphasizes the importance of early and accurate diagnosis and the need for continued research into optimal treatment strategies.

## Conclusion

This case underscores the importance of considering differential diagnoses in nonresponsive dental abscesses, particularly in patients with a history of lymphoma. The initial misdiagnosis delayed appropriate treatment, highlighting the need for vigilance in similar clinical scenarios. Dentists should consider further investigations, including imaging and biopsy, for persistent dental abscesses that do not respond to standard treatments, especially in patients with a prior history of lymphoma. Further research is needed to establish the optimal treatment strategies for DLBCL in extranodal sites, particularly in the maxillary sinus. Studies should focus on improving diagnostic methods, understanding disease progression, and evaluating the efficacy of various treatment regimens.

This case contributes to the broader understanding of extranodal DLBCL presentations and emphasizes the need for interdisciplinary approaches in diagnosis and treatment to improve patient outcomes.

## Limitations

We do not know whether the tumor is a metastasis from testicular cancer or a primary tumor, especially since lymphoma tends to present in different parts of the body simultaneously. Therefore, we send a message regarding the possibility of distinguishing between metastasis from cancer and a primary tumor, and

whether they share the same prognosis. Should all organs be investigated in every patient diagnosed with lymphoma?

### Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Not applicable.

### Author contribution

O.J., S.H., and M.A.: contributed to drafting, reviewing, editing, and approving the final manuscript; O.A.: contributed to drafting, editing, and approving the final manuscript; Z.B.: contributed to drafting, reviewing, editing, corresponding, and approving the final manuscript; S.U.H.: contributed to reviewing, supervising, and approving the final manuscript; F.J.: contributed to drafting, editing, and approving the final manuscript; A.A.: contributed to drafting, editing, and approving the final manuscript.

### Conflicts of interest disclosure

The authors declare that they have no financial conflict of interest with regard to the content of this report.

### Guarantor

All authors have read and approved the manuscript, on behalf of all the contributors. I will act and guarantor and will correspond with the journal from this point onward.

### Data availability statement

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### Provenance and peer review

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