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**Research Article**

# Buccal Lymphoma: A Case Report

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**ABSTRACT**

**Background**

Non-Hodgkin's Lymphoma (NHL) encompasses a diverse group of lymphoid malignancies with varied histopathological and clinical features. Diffuse Large B-Cell Lymphoma (DLBCL) is the most common subtype of NHL, accounting for approximately 30–40% of adult cases. Although primarily arising in lymph nodes, extranodal presentations—especially in the oral cavity—are not uncommon. Oral lymphomas can mimic other neoplastic or inflammatory lesions, leading to potential delays in diagnosis.

**Case Presentation**

We report the case of a 41-year-old female patient with a painless swelling on the left side of her face and an associated oral ulceration over the buccal mucosa. She had poorly controlled diabetes mellitus but no significant history of weight loss, fever, or night sweats. Imaging showed a lobulated, heterogeneously enhancing soft-tissue lesion invading the left alveolar ridge and mandibular region. Biopsy of the buccal mucosa revealed large atypical lymphoid cells positive for CD20, PAX5, BCL-6, and CD10, with a Ki-67 proliferative index of ~98%, consistent with Diffuse Large B-Cell Lymphoma (DLBCL), germinal center subtype. The patient underwent six cycles of R-CHOP chemotherapy with significant metabolic remission observed on interim PET-CT scans. She also received prophylactic high-dose methotrexate to minimize CNS involvement. The patient responded well to therapy and was discharged on maintenance follow-up.

**Conclusion**

This case highlights an unusual primary presentation of DLBCL in the buccal mucosa. Extranodal lymphomas of the head and neck region can be diagnostically challenging given their broad differential diagnoses. A multidisciplinary approach—encompassing otolaryngology, maxillofacial surgery, oncology, pathology, and radiology—is essential for timely diagnosis. Aggressive regimens such as R-CHOP, with CNS prophylaxis when indicated, can yield favorable outcomes. Early recognition of oral lymphomas is particularly critical in immunocompromised or poorly controlled diabetic patients.

## INTRODUCTION

Non-Hodgkin's Lymphoma (NHL) is among the most prominent hematological malignancies, worldwide, with Diffuse Large B-Cell Lymphoma (DLBCL) being the most common aggressive subtype [1,2]. While nodal involvement is commonplace, extranodal disease occurs in 30-40% of cases [3,4]. Within the head-and-neck region, Waldeyer's ring, paranasal sinuses, thyroid, and salivary glands are forms of extranodal involvement, whereas primary involvement of the oral cavity—with extra emphasis on buccal mucosa—is rather uncommon [5].

Therefore these oral presentations may be considered benign, inflammatory conditions like dental infections or nonspecific ulcerations [6]; prompt histopathologic and immunophenotypic evaluation becomes imperative to establish the diagnosis of DLBCL that is characterized by large B lymphocyte proliferation. The germinal center B-cell (GCB) vs. activated-B cell (ABC) classification depends on the immunohistochemical (IHC) markers used [7]. Oral lymphomas, which have been on the increase with improved diagnostics and an aging population [8,9], require that much more vigilance be paid to oral lesions that fail to respond to conventional therapy [10,11].

The diagnosis is definitively made in conjunction with the clinical condition, imaging (CT, PET-CT), and biopsy/immunophenotyping for markers such as CD20, CD10, BCL-6, and Ki-67 [12-14]. With the introduction of rituximab-based therapy, R-CHOP is now the backbone regimen for DLBCL treatment, often in

conjunction with high-dose methotrexate when high-risk situations arise [15, 16]. The prognosis is determined by clinical and molecular risk factors; however, timely recognition and aggressive treatment greatly enhance survival [17-20].

We present a case of a 41-year-old female with poorly controlled diabetes who presented with a mass in the buccal mucosa, which was ultimately confirmed as DLBCL. We describe the epidemiological frame, diagnostic workup, and multidisciplinary treatment leading to a favorable response, emphasizing the need for early suspicion and tailored therapy.

## Case Presentation

### 4.1. Patient Demographics and Clinical History

A 41-year-old female with poorly controlled type 2 diabetes mellitus presented with a painless swelling over the left cheek and an ulcerative lesion in the left buccal mucosa. She had been experiencing progressive difficulty chewing for about four weeks but denied any fever, night sweats, or weight loss.

She did not report a family history of malignancy or documented immunodeficiency, aside from suboptimally managed diabetes. Vital signs remained within normal limits. Physical examination revealed:

- **Extraoral:** A firm, non-tender swelling over the left cheek, not fixed to underlying structures.
- **Intraoral:** An irregular ulcerative growth ~2.5 cm in diameter in the left buccal sulcus, with inflamed surrounding mucosa. No notable cervical lymphadenopathy was detected on palpation.

### 4.2. Imaging Studies

**Contrast-Enhanced CT (CECT) Scan:**

- A 3.1 cm lobulated, heterogeneously enhancing lesion in the left buccal region, with possible cortical thinning of the mandible but no conclusive cortical breach.
- Enlarged lymph nodes (1.2–1.5 cm) in the left Level IB region.

**PET-CT Scan:**

- Intense FDG uptake (SUV ~10) localized to the left buccal mucosa and alveolar process.
- No evidence of distant metastatic disease in the thorax or abdomen.
- Mild FDG uptake in submandibular glands interpreted as reactive.

### 4.3. Histopathological Findings

An incisional biopsy of the buccal lesion revealed diffuse sheets of large lymphoid cells with prominent nucleoli and high mitotic activity. Immunohistochemical staining identified:

- **CD20, PAX5, BCL-6, CD10:** Positive
- **BCL2, Cyclin D1, CD30, c-myc, MUM-1:** Negative
- **Ki-67:** ~98% in neoplastic cells

These findings were consistent with Diffuse Large B-Cell Lymphoma, germinal center subtype. Negative cytokeratin staining ruled out carcinoma. The high Ki-67 index highlighted an aggressive tumor biology.

### 4.4. Clinical Course and Provisional Plan

**Additional Laboratory Results**

- Hemoglobin: 8.7 g/dL (mild anemia)
- WBC: 7,500/µL
- Platelets: 200,000/µL
- Serum LDH: 300 U/L (mildly elevated)
- Fasting Blood Glucose: 210 mg/dL
- HIV, HBV, HCV serologies: Negative

A multidisciplinary tumor board—comprising medical oncology, maxillofacial surgery, hematology, and radiation oncology—recommended combination chemoimmunotherapy with curative intent. The plan included:

1. **R-CHOP Regimen** (6 cycles):
   - Rituximab 375 mg/m^2 (Day 1)
   - Cyclophosphamide 750 mg/m^2 (Day 1)
   - Doxorubicin 50 mg/m^2 (Day 1)
   - Vincristine 1.4 mg/m^2 (capped at 2 mg) (Day 1)
   - Prednisone 100 mg (Days 1–5)
2. **Prophylactic High-Dose Methotrexate**
   - Administered at 3 g/m^2 with leucovorin rescue after cycles 2 and 4, given the high proliferative index and potential local invasiveness near bone.
3. **Supportive Measures**
   - Endocrinology consult for optimized glycemic control.
   - Neutropenic precautions and growth factor support (filgrastim) as needed.
   - IV antibiotics for one episode of neutropenic fever, which resolved within 72 hours.

**Response to Therapy and Outcome**

By the third cycle, an interim PET-CT demonstrated a substantial reduction in the lesion's metabolic activity (SUV decreased from ~10 to ~3). After six cycles, a follow-up PET-

CT indicated no hypermetabolic lesions, suggesting complete metabolic remission.
The patient tolerated chemotherapy with manageable adverse effects (mild mucositis and transient neutropenic fever). She was discharged with instructions for:

- Strict oral hygiene and mild antiseptic mouthwashes.
- Improved diabetic control.
- Routine follow-up and imaging every 3 months.

**DISCUSSION**

Diffuse Large B-Cell Lymphoma (DLBCL) is the most common aggressive B-cell lymphoma, contributing about 30–40 percent of non-Hodgkin's lymphomas in adults [13]. It's true such tumors generally affect lymph nodes, but from other lymphatic sites, tumors such as gastrointestinal, skin, central nervous system, and head and neck can arise. Cavity oral involvement is very rare but may be underscognized because it follows the pattern of benign inflammatory processes. Actually, epidemiological data indicate that primary lymphomas of the oral cavity make up about 3 to 5 % of all oral yet most are of B-cell type [15-16]. Pathogenesis of such extranodal lymphomas at sites such as buccal mucosa is thought to involve complex interactions between the host immune factors, local tissue environment, and genetic aberrations [17]. This

pattern of disease can also be favored by states of immunosuppression, including poorly controlled diabetes or HIV, which predispose toward depressed immune response and persistent antigenic stimulation in chronic cases [18].

Cases of primary buccal lymphoma present themselves with painless swellings or ulcerations. They may not have the typical lymphomatous "B" symptoms encompassing fever, weight loss, and night sweats [19]. The neoplastic character of the clinical onset is rather lazy and can delay the recognition. The differential diagnosis in buccal region conditions would include squamous cell carcinoma, salivary glands tumors, odontogenic infections, and inflammatory or granulomatous pathologies [20]. A high index of suspicion in cases where ulcerative lesions or exophytes have not resolved with standard medical or dental treatments is therefore critical [21]. Thus, most of the DLBCL can be histologically defined by the presence of large lymphocytes with high mitotic rates. However, immunophenotyping is vital for determining the exact subtype, often distinguishing the germinal center B-cell (GCB) from the activated B-cell (ABC) phenotype. Most cases of GCB DLBCL (denoted by positivity for CD20, CD10, BCL-6, and PAX5 at the minimum) are expected to have a more favorable prognosis than the ABC subtype; however, every case needs detailed molecular characterization [22-24]. This patient had a high Ki-67 index of ~98% indicating a high proliferative tumor as well as potential chemosensitivity [25].

Comprehensive staging incorporates the Ann Arbor classification with Cotswolds modifications, which focus on the number of nodal stations involved and any extranodal disease or systemic symptoms present [26]. PET-CT is now part of this, detecting subclinical sites of disease and monitoring early treatment response [27]. Whether this patient had stage I disease limited to the buccal region (IE stage or IAE stage) or not, PET-CT was indeed necessary for ruling out distant or multifocal involvement and establishing a baseline for interim assessment of response [28]. R-CHOP has become the standard of care for the treatment of de novo cases of DLBCL, increasing the five year survival rate to about 60-70% [29]. Application of rituximab-a monoclonal antibody-targeted against CD20-increases treatment effectiveness through antibody-dependent and complement-dependent cytotoxicity [30]. In some high-risk cases-meaning certain extranodal sites or highly proliferative disease-physicians typically add CNS prophylaxis, such as intrathecal chemotherapy or high-dose methotrexate, in order to decrease the chances of leptomeningeal spread [31]. Probably localized radiation therapy has its role in patients with residual disease or presenting bulky, yet caution is needed against complications as osteoradionecrosis in the head and neck area [32].

The durable response rates correspond to the International Prognostic Index (IPI), which combines age, clinical stage, lactate dehydrogenase (LDH), and performance status and evaluates categorical factors such as the number of extranodal sites to determine patient prognosis [33,34]. A high Ki-67 signifies an aggressive tumor biology but would also predict a robust response to cytotoxic agents [35]. At the same time, important comorbidities, especially diabetes mellitus, worsen general prognosis, increasing the risk of infection and complicating tolerability of chemotherapy, underscoring the importance of strict management of blood sugar levels [36,37]. The best possible outcomes will call for a multidisciplinary approach involving hematology, oncology, maxillofacial or ENT surgeons, radiologists, and supportive care teams. Such collaborations not only facilitate accurate diagnosis but also ensure that therapy is administered safely and any complications managed promptly.

Novel agents in addition to emerging therapeutic modalities continue to reshape the treatment landscape. Bruton's Tyrosine Kinase inhibitors, CAR T-cell therapies targeting CD19, bispecific T-cell engagers like glofitamab, and immunomodulatory drugs such as lenalidomide, are showing quite recent efficacies in treating refractory or relapsed DLBCL, thus offering a new avenue for patients who usually do not respond to frontline regimens [38-42]. R-CHOP remains the backbone for initial treatment of most newly diagnosed cases, especially with due attention to supportive care and prompt identification of complications. Involved oral presentations as in this case rely much on good biopsy, excellent multidisciplinary cooperation, and tailored therapy to potentially lead to remission.

## CONCLUSION

Primary DLBCL of buccal mucosa would be a very rare but important differential for oral malignancy. It is usually a rather painless and slow clinical course that presents itself a lot like benign lesions and will most likely get a diagnosis late in the process. This case highlights the importance of prompt biopsy, advanced imaging, and full immunophenotyping in arriving at the right diagnosis.

Aggressive chemoimmunotherapy with R-CHOP, combined with high-dose methotrexate as prophylaxis for high-risk features, can lead to complete remission, as shown here. Strict management of co-existing diseases, especially poorly controlled diabetes, is of utmost importance to limit any complications occurring.

While new targeted agents and immunotherapies have a lot to offer, standard R-CHOP continues to be very beneficial for newly diagnosed DLBCLs. Timely recognition, multidisciplinary collaboration, and vigilant supportive care are essential for successful outcomes in oral lymphomas.

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### Conflict of Interest

The authors declare no conflict of interest regarding the publication of this paper.

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### Patient Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. Patient anonymity has been preserved.

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