

# **Burkitt's Lymphoma**

Emily Del Cervo

Oral Pathology 2023

D043

## **Overview**

Burkitt's Lymphoma is a rare, extremely aggressive, Non-Hodgkin's lymphoma (NHL) (Ozdede et al., 2022). When it was first discovered in Africa, it was misdiagnosed as a sarcoma of the jaw (Ozdede et al., 2022). Since then, it has become the most common pediatric tumor in areas of the world where malaria is endemic (Casulo, Friedberg, 2018). It is categorized as a malignant tumor of B-cells and it is the fastest growing human tumor known to date. There are three main types of the virus: sporadic, immunodeficiency related, and endemic. One of the biggest discoveries regarding Burkitt's lymphoma is that it can be caused by Epstein Barr Virus (EBV), because the virus has the ability to affect B-cells (Hutcheson, 2020). This was the first virus to be recognized as a human cancer virus; this discovery has led to essential research about the relationship between viruses and cancer (Casulo, Friedberg, 2018).

## **Etiology**

The etiology of endemic Burkitt's lymphoma is still being researched because it is not fully understood. What is known, is that most tumors

associated with Burkitt's lymphoma test positive for the Epstein-Barr virus, but are not necessarily the cause of it or mandatory for the diagnosis of Burkitt's lymphoma (Quintana et al., 2020). Studies conclude that malaria specifically caused by the parasite *P. falciparum*, may indirectly cause endemic Burkitt's lymphoma (Quintana et al., 2020). This is because it compromises the immune response that is responsible for limiting the replication of B-cells infected with the Epstein-Barr virus (Quintana et al., 2020).

### **Clinical Presentation**

Burkitt's lymphoma can present on various anatomical sites but it often affects the abdominal region and the head and neck (Arboleda et al., 2021). In more than 50% of the endemic form of these cases, the jaw is involved (Ozdede et al., 2022). It can affect both the maxilla and mandible together or singularly. Subjective findings include pain, chin numbness and headaches. Although, symptoms may vary based on the case. Objectively, individuals can experience a tumor, swelling, cervical lymphadenopathy, bone destruction, tooth mobility, ulceration, tooth displacement, abscess, gingival hyperplasia, bleeding, a nasal-y voice,

fever, nasal obstruction, erythema, snoring, weight loss, paresthesia, tooth loss, and/or trismus.

## **Demographic**

In general, males are more likely to be diagnosed with Burkitt's lymphoma than females. The endemic Burkitt's lymphoma affects children between the ages of four to seven, in locations where malaria is prevalent (Casulo, Friedberg, 2018). The sporadic Burkitt's lymphoma can occur at any age and occurs in areas where malaria is not prevalent (Casulo, Friedberg, 2018). In addition, it is not associated with Epstein-Barr virus comparable to the endemic type. The last type of Burkitt's lymphoma, the immunodeficiency related type, it occurs in all ages, but is typically limited to those with HIV or that have received an organ transplant (Casulo, Friedberg, 2018). Geographic location does not influence the diagnosis of this type of Burkitt's lymphoma.

## **Biopsy / Histology / Radiographs**

Because Burkitt's lymphoma is so aggressive, it is imperative radiographs are taken immediately and biopsy is performed, so that a

prompt diagnosis can be made. Radiographically, Burkitt's lymphoma displays as a multilocular, ill-defined, invasive, radiolucent lesion with cortical destruction (Ozdede et al., 2022). According to Graham and Lynch, in the article *Burkitt Lymphoma*, published in 2023, "Adequate tissue is paramount to the diagnosis. Fine needle aspiration might not provide enough tissue for the diagnosis; thus, excision biopsy is preferred." Histologically, the tissue will have a "starry sky" appearance due to the macrophages filled with cellular debris (Graham and Lynch, 2023). There will be intermediate-size, mature lymphocytes with round nuclei and lacy chromatin (Graham and Lynch, 2023).

### **Differential Diagnosis**

Burkitt's lymphoma has the potential to be misdiagnosed. Differential diagnosis' are primarily other types of CD10 positive B-cell lymphomas which include: diffuse large B-cell lymphoma, high-grade follicular lymphoma, and B-cell acute lymphoblastic leukemia/lymphoma (Graham and Lynch, 2023). Other diagnoses could be: rhabdomyosarcoma, blastomycosis, a dental abscess, periodontitis, osteomyelitis, pyogenic granuloma, nasopharyngeal carcinoma, sinusitis,

tonsillitis, B-cell hyperplasia, Langerhans cell histiocytosis, mumps, or pericoronitis.

## **Treatment**

Treatment of Burkitt's lymphoma is based on the case, patients age and stage of disease. In all cases, there needs to be a complete surgical resection of the disease (Graham and Lynch, 2023). Pediatric patients are recommended to receive two cycles of chemotherapy of moderate-intensity after resection (Graham and Lynch, 2023). Pediatric patients with residual or stage three disease should receive four cycles of dose-intensive chemotherapy (Graham and Lynch, 2023). In pediatric patients with CNS or bone marrow involvement, eight cycles of dose-intensive chemotherapy should be done (Graham and Lynch, 2023). In patients with HIV, highly active anti-retroviral therapy (HAART) allows for high dose chemotherapy for be done (Graham and Lynch, 2023).

## **Prognosis**

Even though Burkitt's lymphoma is a highly aggressive cancer, the prognosis is not always poor when receiving treatment. In general, younger patients tend to have a better prognosis because they can

tolerate the intense chemotherapy cycles better than an older patient (Graham and Lynch, 2023). Malnourishment, regardless of age, and relapse within six months of treatment make for a worse prognosis (Graham and Lynch, 2023). Because of the aggressive nature of the disease, it is crucial that those diagnosed with Burkitt's lymphoma receive treatment otherwise they most likely will not survive.

### **Professional Relevance**

It is extremely important that the entire dental team, including the dental hygienist, knows the clinical signs and symptoms of Burkitt's lymphoma. This disease often presents on the head and neck and unfortunately, it can easily be misdiagnosed. Because it is the most rapid growing human tumor, early diagnosis of this disease is crucial and can lead to a better prognosis for the patient. In conclusion, dental hygienists need to educate themselves on the etiology, demographics, and clinical signs related to Burkitt's lymphoma so that they can provide their patients with optimum care.

## Citations

Arboleda, L. P. A., Rodrigues-Fernandes, C. I., & Almeida Mariz, B. A. L. (2021, June 5). *Burkitt lymphoma of the head and neck: An international collaborative study*. Wiley Online Library. <https://onlinelibrary-wiley-com.citytech.ezproxy.cuny.edu/doi/full/10.1111/jop.13209>

Casulo, C., & Friedberg, J. W. (2018, September). *Burkitt lymphoma- a rare but challenging lymphoma*. Science Direct. <https://www-sciencedirect-com.citytech.ezproxy.cuny.edu/science/article/pii/S1521692618300525>

Graham BS, Lynch DT. Burkitt Lymphoma. 2023 Aug 7. StatPearls. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. [https://www.ncbi.nlm.nih.gov/books/NBK538148/Hutcheson RL, Chakravorty A and Sugden B \(2021\) Burkitt Lymphomas Evolve to Escape Dependencies on Epstein-Barr Virus. \*Front. Cell. Infect. Microbiol.\* 10:606412. doi: 10.3389/fcimb.2020.606412](https://www.ncbi.nlm.nih.gov/books/NBK538148/Hutcheson RL, Chakravorty A and Sugden B (2021) Burkitt Lymphomas Evolve to Escape Dependencies on Epstein-Barr Virus. Front. Cell. Infect. Microbiol. 10:606412. doi: 10.3389/fcimb.2020.606412)



Ozdede M, Dere KA, Unver-Koluman B, Gormez A, Sen-Turk N,  
Hekimgil M. *A Life-Saving Early Diagnosis of Burkitt Lymphoma  
Involving Both Jaws, Misdiagnosed as Pericoronitis*. J Basic Clin  
Health Sci 2022; 6:931-937

Quintana, M. del P., Smith-Togobo, C., Moormann, A., & Hviid, L.  
(2020, March 4). *Endemic Burkitt lymphoma – an aggressive  
childhood cancer linked to Plasmodium falciparum exposure, but  
not to exposure to other malaria parasites*. Wiley Online Library.  
[https://onlinelibrary-wiley-com.citytech.ezproxy.cuny.edu/doi/full/  
10.1111/apm.13018](https://onlinelibrary-wiley-com.citytech.ezproxy.cuny.edu/doi/full/10.1111/apm.13018)