

**MISINTERPRETATION OF INFLAMMATORY LESION AND BURKITT'S LYMPHOMA IN SWELLING AND TOOTH MOBILITY CASES**  
***(MISINTERPRETASI LESI INFLAMASI DAN BURKITT LYMPHOMA DALAM KASUS PEMBENGKAKAN DAN KEGOYANGAN GIGI)***

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**ABSTRACT**

Most complaints in dentistry today are about swelling and mobility of the tooth, and the diagnosis of an inflammatory lesion is generally made in both complaints. Burkitt's lymphoma (BL) is a type of malignant tumor classified as Non-Hodgkin's Lymphoma (NHL) with clinical symptoms of swelling dan tooth mobility similar to the inflammatory lesions. This paper aims to describe the similarities between inflammatory lesions and Burkitt's lymphoma. Burkitt's lymphoma can be classified into endemic, sporadic, and human immunodeficiency-related. Sporadic BL (sBL) occurs in approximately 12 to 30% of maxillofacial patients and commonly affects children. Several case studies reported that the clinical symptom of sBL is swelling. It has been reported in Europe and Asia that sBL in children shows swelling and tooth mobility in the maxillary and mandibular regions. Enlargement and redness of gingival tissue, hypermobility of the tooth, and swelling

of the gingival around the painful tooth were reported as sBL cases after some examination. Inflammatory lesions such as BL-like have similar clinical symptoms, so the dentist must be careful in diagnosing cases of swelling and tooth mobility.

**Keywords:** Burkitt's lymphoma; inflammatory lesion; swelling; tooth mobility

### **ABSTRAK**

*Sebagian besar keluhan dalam bidang kedokteran gigi saat ini berupa pembengkakan dan mobilitas gigi, dan diagnosis lesi inflamasi umumnya ditegakkan dalam kedua keluhan tersebut. Burkitt's lymphoma (BL) merupakan salah satu jenis tumor ganas yang tergolong Non-Hodgkin's Lymphoma (NHL) dengan gejala klinis berupa pembengkakan dan mobilitas gigi yang mirip dengan lesi inflamasi. Tujuan dari artikel ini adalah untuk menggambarkan kemiripan antara lesi inflamasi dan Burkitt's lymphoma. Burkitt's lymphoma dapat diklasifikasikan menjadi 3 jenis: endemic, sporadic dan terkait dengan imunodefisiensi. Sporadic BL (sBL) terjadi sekitar 12 sampai 30% pasien maksilofasial dan umumnya menyerang anak-anak. Beberapa studi kasus melaporkan bahwa gejala klinis sBL berupa pembengkakan. Telah dilaporkan di Benua Eropa dan Asia bahwa sBL pada anak menunjukkan pembengkakan dan mobilitas gigi pada regio rahang atas dan rahang bawah. Pembesaran dan kemerahan jaringan gingiva, hipermobilitas gigi, pembengkakan gingiva di sekitar gigi yang sakit dilaporkan sebagai kasus sBL setelah melalui beberapa pemeriksaan. Lesi inflamasi dan Burkitt lymphoma memiliki beberapa gejala klinis yang mirip, sehingga dokter gigi harus berhati-hati dalam menegakkan diagnosis pada kasus pembengkakan dan kegoyangan gigi.*

**Kata kunci:** Burkitt's lymphoma; kegoyangan gigi; lesi inflamasi; pembengkakan

## INTRODUCTION

Burkitt's lymphoma (BL) is an aggressive form of Non-Hodgkin B-cell lymphoma usually diagnosed in children. Burkitt's lymphoma is classified into endemic (eBL), sporadic (sBL), and immunodeficiency-associated types. Oral BL is commonly found in males and usually causes complaints of facial swelling with an intraoral exophytic mass followed by tooth mobility.<sup>1</sup>

BL can cause tooth mobility in the oral cavity and other local factors like periodontitis.<sup>2</sup> Periodontitis is an inflammatory disease of periodontal tissue.<sup>3</sup> Clinical examination of periodontitis commonly presents bleeding on probing, redness, and gingival swelling.<sup>4</sup>

The periodontal abscess is another inflammatory disease that localizes in periodontal tissue.<sup>5</sup> Patients with periodontal abscess usually have tooth mobility cases about 56,6%-79%.<sup>6</sup> Several case studies report that sporadic (sBL) types of BL have been found with clinical symptoms, such as swelling and tooth mobility. sBL is most commonly found in cervical lymphadenopathy, which can make diagnosis difficult and lead to misdiagnosis.<sup>2</sup> This paper aims to describe BL cases with similar symptoms with several inflammatory conditions.

## METHOD

This paper followed a literature review methodology. A literature review design gathers information on formulating the problems in research sources, including scientific research journals, earlier research manuscripts, and related textbooks.

A literature search was done combining "Burkitt's lymphoma" and "inflammatory lesion" after finding the chosen descriptors in papers on the subject and the Medical Subject Headings (MeSH). The data were accessed from PubMed and Google Scholar. Animal studies, duplicate papers, incomplete articles, and articles that, upon reading, did not suit the suggested theme were all disregarded from this paper.

## RESULT

Based on search results on PubMed with the keywords previously described, 37 available journals were found, and based on searches on Google Scholar, 381 journals were found. 15 journals match the topic after screening by authors.

## DISCUSSION

### Burkitt's Lymphoma

Burkitt's lymphoma (BL) is a Non-Hodgkin's lymphoma (NHL) classified as mature neoplasia of B lymphocyte cells. BL

is classified as an aggressive lymphoma with characteristics of chromosomal translocations, especially MYC translocations. BL is curable and was first known to be associated with HIV.<sup>7</sup>

Burkitt's lymphoma is most common in children aged 5-8 years. Lesions are commonly found in the maxilla, mandible, and abdomen. The clinical features of the oral cavity are local swelling and tooth mobility. Symptoms are generally localized, dull, and painful paresthesias. The clinical symptoms of BL are initially recognized by the presence of enlarged lymph nodes that are painless and grow rapidly in the neck, thighs, or under the jaw.<sup>8</sup>

The histopathological feature of BL is a monomorphic population of mature lymphocytes of intermediate size. The cells feature one or more tiny nucleoli and spherical nuclei with lacy chromatin. The cells typically contain large vacuoles and basophilic cytoplasm.<sup>9</sup> The cells show clear cytoplasmic borders in hematoxylin-eosin-stained sections, giving them a molded look. Variations in morphology can be plasmacytoid or pleomorphic. The increasing number of mitotic figures reflects the high proliferation rate of cancerous cells. Apoptosis increases in response to increased cell turnover. It causes tissue to look like a "starry sky"

because tingible-body macrophages are filled with cellular debris.<sup>7</sup>

Burkitt's lymphoma has three subtypes: endemic Burkitt's Lymphoma (eBL) type, sporadic Burkitt's Lymphoma (sBL) type, and immunodeficiency-associated type.<sup>10</sup> In developed countries, sBL, also known as American or idiopathic lymphoma, affects 1-3 instances per million people. The average age at which sBL manifests is 12 years, and the male-to-female ratio ranges from 2:1 to 4:1. In between 12 and 30% of cases, sBL can be found in the maxillo-facial region.<sup>11</sup>

### **Inflammatory Lesion**

There are many kinds of diseases in the oral cavity that are classified as inflammatory lesions. Periodontitis is an example of an inflammatory disease in the periodontal tissues of the teeth caused by specific microorganisms.<sup>3</sup> Clinical examination of periodontitis shows increased probing depth, gingival redness, and gingival swelling.<sup>4</sup>

A periodontal abscess is another inflammatory lesion that destroys the periodontal ligament and alveolar bone. The clinical features of a periodontal abscess are generally gingival swelling and discoloration, increased probing depth, sensitive teeth on percussion test, tooth mobility, and rapid loss of periodontal

attachment.<sup>12</sup>

### **Similarity Between Burkitt's Lymphoma and Inflammatory Lesion**

Several case reports stated that several pediatric patients diagnosed with sporadic Burkitt's lymphoma (sBL) had been found in Europe and Asia. The first case reported by Ohashi et al.<sup>1</sup> was experienced by an 8-year-old boy in Japan with complaints of swelling and pain in the left maxillary gingiva. The patient experienced swelling of the lower face, facial nerve paralysis, and skin redness. No enlarged lymph nodes were found, and the patient experienced trismus with a maximum interincisal opening of 10 mm. Intraoral examination showed swelling, redness, and pain in the maxillary gingiva around the left lateral incisor. The left maxillary lateral incisor's tooth mobility (Miller classification) was class 2.

The second case was reported by Cabras et al.<sup>10</sup> and experienced by a 15-year-old girl in Italy with complaints of dull pain in the right second permanent molar. The tooth had received root canal treatment from a previous dentist and was prescribed 2 grams of amoxicillin per day for one week, with no success. The patient admits hypoesthesia on the right lower lip. The oral examination results showed swelling of the gingiva around the diseased tooth and

extending to the right palatal mucosa. No abnormalities were found on the lower lip.

The third case was reported by Kulczyk et al.<sup>11</sup> in an 11-year-old patient in Poland with suspected inflammation of the periapical tissue in the mandibular left premolar region. Clinical examination revealed hypermobility of teeth 34 and 35 with enlargement and redness of the gingival tissue on the affected area's vestibular and lingual sides. The tooth showed no carious lesions, questionable vitality, or palpable lymphadenopathy.

The diagnosis in the three cases above, based on the results of the examinations, was Burkitt's lymphoma of the sporadic type (sBL). sBL is a poorly differentiated lymphocytic lymphoma that appears worldwide, regardless of geographical location. Sporadic BL primarily affects children and presents with an abdominal mass, while the jaw and sinuses are rarely involved.<sup>13,14</sup>

sBL in the jaw region usually presents as an extranodal tumor with undifferentiated monoclonal B cell proliferation. Clinical signs of tumors in the oral cavity include tooth loss,<sup>11</sup> increased tooth mobility,<sup>13</sup> mucosal swelling that resembles the development of a periapical abscess,<sup>10</sup> mucosal swelling with a hard, non-fluctuating mass.<sup>15</sup> A localized hard swelling with or without pain sensations

was observed in numerous studies.<sup>15-17</sup> Hypoesthesia of the right lower lip was occasionally noted when the tumor was in the jaw.<sup>18,19</sup> An expanding mass in instances of the maxilla could cause pruritus, proptosis, diplopia, and orbital enlargement.<sup>15,20</sup> Two cases from the three previously reported journals stated that there was tooth mobility in patients with a diagnosis of sBL. Loose teeth are commonly found in patients with periodontitis. Periodontitis is an inflammatory condition of the periodontal tissues with several clinical symptoms, such as redness of the gingiva, bleeding on probing, and tooth mobility.<sup>4</sup>

Clinically, oral sBL behaves as a quickly developing, rapidly expanding tumor that can cause sudden teeth loosening, occlusal precontact with chewing difficulty, teeth malposition, and toothache-like pain. In addition to resembling inflammatory lesions, sBL is readily confused with an odontogenic disease, causing the general dentist (GDP) to give antibiotics and carry out pointless procedures like root canals on the teeth most proximal to the painful or swollen area.<sup>10</sup>

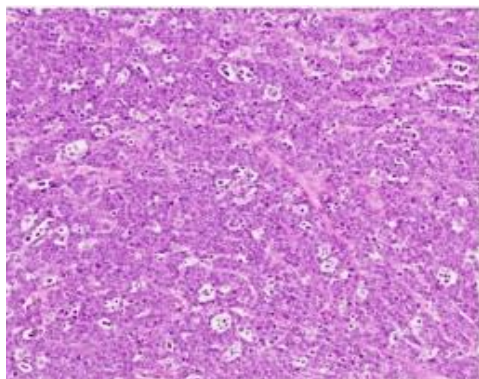
The clinical symptoms that appear in several disorders of the oral cavity have some similarities with one another. Dentists who fail to conduct a thorough examination may make an incorrect diagnosis. A

thorough examination, including clinical, systemic condition, radiograph, and histopathological examination, is needed to get a definite diagnosis and avoid misdiagnosis. In the three previously reported cases, it was stated that the operator performed radiographic and histopathological examinations until a diagnosis of Burkitt's lymphoma was obtained.

In the first case<sup>1</sup>, according to the computed tomography, found a lesion at the left anterior maxilla and the masticator muscle. Following an incisional biopsy of the left anterior maxillary gingiva, the histopathological diagnosis was BL. Atypical lymphoid cell proliferation was monotonous, and hematoxylin and eosin staining revealed a "starry sky" look with medium-sized cell proliferation, numerous cell divisions, and numerous apoptosis (Fig.1).<sup>1</sup>

The second case<sup>10</sup> mentions that Orthopantomography (OPT) was unremarkable and did not reveal any indications of odontogenic illness. The inter-radicular tissue from the extracted permanent maxillary right second molar, gingiva, palatal bone, and mucosa was sampled during a field mapping biopsy. Each histology slide displayed a diffuse infiltration of monomorphic, non-cleaved round nuclei and a high rate of spontaneous

apoptosis.



**Figure 1.** Histological features of BL were found in an 8-year-old boy biopsy specimen. There were starry sky patterns with numerous cell divisions and apoptosis.<sup>1</sup>

The third case<sup>11</sup> reported that A cone beam computed tomography (CBCT) scan of tooth 35 revealed root resorption, and the area between teeth 33 and 36 had severe demineralization with loss of trabecular bone structure, destruction of the buccal and thinned lingual cortical plates (Fig.2). Burkitt's lymphoma was discovered through a histopathological analysis.



**Figure 2.** Panoramic reconstruction from CBCT examination in 11 y.o patient. The apical region of tooth 35 saw a "floating in the air" appearance and apical resorption.<sup>11</sup>

In this case, tooth mobility and swelling were common in patients with periodontitis and periodontal abscesses. Still, in the three previously reported cases, a starry sky (Fig. 1) was found after histopathological examination, which is characteristic of Burkitt's lymphoma. Histological features of BL generally show a starry sky pattern of pleomorphic and highly lymphocytic macrophages.

## CONCLUSION

Several case reports show that sporadic Burkitt's Lymphoma (sBL) symptoms are similar to several inflammatory lesions that show symptoms of swelling and tooth mobility. A thorough examination is required to diagnose with certainty, especially in pediatric patients with complaints similar to sBL to avoid misinterpretation of some inflammatory lesions.

## CONFLICT OF INTEREST

We state there is no conflict of interest in this article.

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