Mimicking Odontogenic Pain Caused by Burkitt’s Lymphoma: A Case Report

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Burkitt’s lymphoma is a malignant monoclonal proliferation of early B-lymphocyte. Since Burkitt’s lymphoma is a highly aggressive disease, early detection is crucial. This disease often involves jaw and mandibular mass or swelling may also be seen, but in the early phase of Burkitt’s lymphoma these symptoms cannot be observed. A rare case of Burkitt’s lymphoma without any mandibular mass and the general symptoms was present. The excruciating toothache led the patient to visit the dental clinic and misdiagnosis of chronic periodontal abscess was made initially. Dentists should consider the oral manifestations of systemic disease when the multiple periodontal ligament space widening is observed and the dental treatment for mimicking odontogenic pain has no effect.

Key Words: Burkitt lymphoma; Periodontal ligament; Toothache

INTRODUCTION

Burkitt’s lymphoma is a malignant disease characterized by malignant monoclonal proliferation of early B-lymphocyte.¹ There are 3 types of Burkitt’s lymphoma; endemic (African), sporadic (non-African), and immunodeficiency-associated.² Although symptoms, age of onset, and prevalence vary depending on the types of disease, they share similar histological characteristics. Endemic type often involves jaw and shows mandibular mass or swelling, but these characteristics usually are not observed in the early phase of Burkitt’s lymphoma.³ Since Burkitt’s lymphoma is highly aggressive disease, early diagnosis is crucial for the promising prognosis. In this study, a Burkitt’s lymphoma case of 30-year-old male with the chief complaint of abrupt teeth sensitivity and severe pain was evaluated.

CASE REPORT

A 30-year-old male reported to the department of Conservative Dentistry, Seoul National University Dental Hospital (SNUDH) with the chief complaint of increased teeth sensitivity, pain, and mobility, and numbness of lower lip and jaw that started a month ago. The patient had a history of brain surgery due to injury after a fall 5 years ago and had been taking pregabalin to relieve the spinal pain. There was no other significant medical history or medication.

Intraoral examination showed hypersensitivity and hypermobility of multiple teeth (24, 25, 34, 35, 36, 37, 46, 47 based on federation dentaire internationale system) and distal gingival swelling around #37. No sign of caries was observed except a secondary caries at #37. #36 tooth was in the initial stage of endodontic treatment at a local clinic 1-month ago. Generally, the patient was in a good dental
condition without any calculus deposition. Radiological findings showed general loss of lamina dura with widening of periodontal ligament (PDL) space (Fig. 1, 2). Initial diagnosis with chronic apical periodontitis on multiple teeth was made and the patient was prescribed with antibiotics and non-steroidal anti-inflammatory drugs (NSAIDs). The patient was then referred to the department of Oral and Maxillofacial surgery of SNUDH for further examination. Two days later, the patient was admitted to the emergency room due to intensive teeth pain because antibiotics and NSAIDs showed no significant pain-relieving effect on the patient. This time, morphine was injected to manage the pain but showed a limited effect. Next day the patient re-visited the department of Conservative Dentistry with intensified teeth pain. Even mild pressure on the right and left mandibular molars triggered excruciating pain and headache.

The patient was suspected with hematopoietic malignancy based on maxilla and mandible computed tomography (CT), which showed significantly increased attenuation of both sides of mandibular body and ramus and complete loss of lamina dura at mandibular molar areas (Fig. 3). But the laboratory test showed no significant abnormal findings that indicates hematopoietic malignancy. The patient was referred to the department of Hemato-Oncology of Seoul National University Hospital for additional examinations with brain magnetic resonance imaging and position

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**Fig. 1.** Dental panoramic radiograph; total loss of lamina dura and widening of periodontal ligament space of multiple teeth were observed.

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**Fig. 2.** Periapical radiograph; widened periodontal ligament space of right mandibular first molar and second molar was observed.

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**Fig. 3.** Total loss of lamina dura at right and left maxillary molars was observed in computed tomography.
emission tomography (PET)-CT. The hypermetabolism in the soft tissue of anterior mediastinum, bone marrow, spleen and thymus was identified in PET-CT, which suggested probably lymphoma. The patient was finally diagnosed with Burkitt’s lymphoma after bone marrow biopsy. The patient has since been receiving chemotherapy (methotrexate and leucovorin), and his previous dental symptoms, such as severe teeth pain and mobility has subsided without any dental treatment.

**DISCUSSION**

Burkitt’s lymphoma is malignant monoclonal proliferation of early B-lymphocyte and categorized as non-Hodgkin’s lymphoma. Burkitt’s lymphoma was named after Denis Burkitt who first identified and characterized the disease from an African child. According to 2008 World Health Organization, Burkitt’s lymphoma can be categorized into 3 different types; endemic, sporadic, and immunodeficiency-related. Endemic (African) is associated with Epstein-Barr virus and highly prevalent among African children. This type commonly involves jaw bone and may affect central nerve system to induce neural damages, numbness, and systemic prostration. Sporadic (non-African) type occurs world-wide but significantly more prevalent in Africa and Europe. Sporadic type has little association with Epstein-Barr virus (EBV). Immunodeficiency-associated type commonly occurs in patients with human immunodeficiency virus infection and acquired immune deficiency syndrome. Sporadic and immunodeficiency-associated type of Burkitt’s lymphoma usually forms abdominal mass. In our case, the patient showed negativity for EBV in the site of lymphoma and spleen and thymus involvement.

Diagnosis of Burkitt’s lymphoma can be confirmed by biopsy of affected lymph nodes and affected sites. Since Burkitt’s lymphoma is highly aggressive malignant disease and may affect central nervous system, early diagnosis and treatment are the most crucial factors for promising prognosis. Patients with chemotherapy at the early stage of the disease show significantly higher survival rate than those with chemotherapy at the advanced stage.

The main reason for the patient to visit a dental clinic is a pain that seems to be originated from teeth and jaw bone. However in rare cases, cause of tooth pain may be associated with malignancy and it is easy to misdiagnose without other clinical evidences confirming it. Thus, the dentist should differentiate odontogenic and non-odontogenic origins.

In this case study, the initial symptoms of the patient with Burkitt’s lymphoma were extreme toothache, hypersensitivity, and mobility. The most important initial diagnostic tool was dental radiographs, which showed PDL widening of multiple teeth. Nzeh examined dental radiographs of Burkitt’s lymphoma patients and found that 20 (91.0%) out of 22 Burkitt’s lymphoma cases show erosion of dental lamina dura. As the disease progresses, lamina dura is completely lost and teeth displaces from the sockets due to bone resorption and soft tissue infiltration around teeth. Various sizes of mass can be observed in Burkitt’s lymphoma involving mandible accordingly to its grades, but in many cases there might be no observable mass. Burkitt’s lymphoma without observable mass or mandibular swelling resembles the symptoms of periodontitis, such as toothache, tooth displacement, tooth loss, and gingival swelling.

Generally, odontogenic tooth pain is mitigated by antibiotics and NSAIDs, but toothache due to tumor cell infiltration does not respond to such drugs. Since the prognosis of Burkitt’s lymphoma depends on the early diagnosis and treatment, it is important to suspect Burkitt’s lymphoma when a patient complains with severe toothache that does not respond to antibiotics or NSAIDs. Dental radiographs have to be carefully examined and if multiple PDL space widening is observed, hematopoietic malignancy should be considered as one possibility. The following diseases are associated with the widening or loss of PDL space and should be differentiated from Burkitt’s lymphoma: osteomyelitis; osteosarcoma; chondrosarcoma; progressive systemic sclerosis; radiation-induced bone defect; and bisphosphonate-related osteonecrosis. A careful history taking can help to diagnose radiation-induced bone defect and bisphosphonate-related osteonecrosis. Infection focus should be found in the osteomyelitis. A thorough clinical examination, a history taking, the proper laboratory tests and the radiographs should be performed. Dentists should acknowledge the oral manifestations of systemic disease and refer to the medical doctors for an early diagnosis and the proper treatment.
CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES