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CASE REPORT

Burkitt's lymphoma in a young Brazilian boy

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Abstract

Burkitt's lymphoma is not an uncommon malignancy in the paediatric population. It is a high-grade non-Hodgkin B-cell lymphoma which may present as endemic, sporadic and human immunodeficiency-associated subtypes. The African, or endemic, variant usually involves the maxilla and other facial bones while head and neck manifestations in sporadic Burkitt's lymphoma are rare. We described a case of oral Burkitt's lymphoma involving the right jaw in a 4-year-old boy. The patient presented with a rapidly-enlarging swelling of one month duration, toothache-like pain and radiographical appearance of 'floating teeth' in the right mandible. Incisional biopsy revealed small round tumour cells with scarce cytoplasm and multiple small nuclei interspersed by phagocytic macrophages. The tumour cells were immunopositivity for CD20 and CD10, expressed weak positivity for CD3, negative for CD5 and showed >90% positivity for Ki-67. Tumour remission was achieved with six cycles of chemotherapy with the CHOP regime.

Keywords: Burkitt's lymphoma, non-Hodgkin B-cell lymphoma, cancer

INTRODUCTION

Burkitt's lymphoma was first characterized by Denis Burkitt in 1958 while he was a surgeon for the Colonial Medical Service in Uganda. It is an aggressive form of non-Hodgkin B-cell lymphoma, usually diagnosed in children and young adults, but rarely seen in middle-aged adults.[1-3] It is now accepted that there are three subtypes: the endemic (African) type, that has a peak incidence between the ages of 5 and 7 years and involves the jaw in more than 50% of cases; the sporadic (American) type, with a mean age of 11 years and usually presents as an abdominal mass; and the third type that is associated with acquired immunodeficiency states.[4]

The clinical presentation of Burkitt's lymphoma is characterized by rapid progression of symptoms with frequent multifocal extranodal involvement. Within the oral cavity, this tumour can progress very fast and appears as a facial swelling or exophytic mass involving the jaws.[5]

Herein the case reported describes the occurrence of oral Burkitt's lymphoma affecting the right mandible of a 4-year-old boy.

CASE REPORT

The patient, JPMV, is a 4-year-old male from Morrinhos-GO, who attended the Oral Diagnosis Service of Paulista University in April 2007. He was referred by the Oral Surgeon from Urgency's Hospital of Goiania, for evaluation of an injury in his right mandible. According to the referral, the child reportedly felt a sharp toothache-like pain for a month before he was referred for an extraction of the supposed offending tooth at the complaint site. Subsequently a rapidly-growing enlargement in his right mandible was noted. Physical and extra-oral examination revealed severe facial asymmetry on the right side (Figure 1a). The patient's skin was of normal color, he was eupneic and there were no symptoms of systemic changes. The patient did not present with any complaint of pain. However,

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the enlargement of his right mandible caused difficulty with oral functions. Upon intra-oral examination, a single lesion in the right mandible, presenting with a vegetative appearance, diffuse, irregular edges, and measuring approximately 12x11cm was found (Figure 1b).

Radiographically, the lesion was single, radiolucent and with imprecise limits, causing teeth displacement and resorption of cortical bone (Figure 2).

Under general anesthesia, incisional biopsy of the lesion was performed and the specimen was submitted for histopathological examination. Microscopical examination of the lesional tissues showed small round cells with scarce cytoplasm and multiple small nuclei interspersed by macrophages in the process of phagocytosis, consistent with a diagnosis of Burkitt´s lymphoma (Figure 3a). Immunohistochemical examination revealed diffuse positivity for CD20 and CD10, weak positivity for CD3, negative immunoreaction for CD5 and positivity in more than 90% of tumour cells for Ki-67, further supporting the morphological diagnosis (Figure 3b). The patient was referred to the Oncopaediatric Department of the Araújo Jorge Hospital, in Goiania. Myelogram was performed and the possibility of marrow involvement by lymphoma was ruled out. The patient was started on chemotherapy (CHOP regime) in May 2007. After three cycles of chemotherapy, there was massive reduction in the tumour size and with general health improvement. The patient continued his chemotherapy, and the only significant clinical complication was the development of herpetic stomatitis during the sixth cycle of chemotherapy, with fever and leucopenia.

MaxCef® and Acyclovir® therapy was instituted and significant improvement was achieved following five days of treatment. The patient completed the sixth cycle of chemotherapy and progressed well, with no fever or major complications. The treatment ended uneventfully in August 2007. The patient is in remission disease-free for 11 months and he has been in regular follow-up in the Oncopaediatric Department of Araújo Jorge Hospital (Figures 4a, 4b and 4c).

DISCUSSION

Lymphomas account for about 10% of all malignant diseases in children younger than 15 years of age. Sixty percent of the lymphomas occurring in children are non-Hodgkin lymphomas (NHL). Burkitt's lymphoma (BL) is a subgroup of NHL with distinct epidemiological, clinical, pathological, immunological and molecular cytogenetic characteristics. The tumour consists of high grade, diffuse, small non-cleaved B-cell lymphocytes.[6] The Burkitt's lymphoma, a CD19, CD20, CD21 and surface immunoglobulin positive B cell lymphoma with the histological appearance of a "starry sky", is classified into three types, endemic, sporadic and immunodeficiency associated.[7]

Head and neck involvement in Burkitt's lymphoma includes the facial bones, jaws and other extranodal sites. The jaws are involved in 7-29% of the cases in studies of non-endemic BL and in 55% of the cases in Africa. The main clinical signs and features of the jaws in the diagnosis of BL are: loosening and extrusion of the molar teeth (primary and permanent), premature shedding of primary molars and premature eruption of permanent molars, swelling of alveolar regions and jaws, and gingival enlargement.[6] In the current case, a rapidly-enlarging swelling, toothache-like pain and radiographic appearance of 'floating teeth' concurred with the findings of Burkitt's lymphoma affecting the jawbones.

The frequency of the correlation between Epstein-Barr virus (EBV) infection and BL varies greatly in different parts of the world.[6] At least 90% of endemic Burkitt's lymphoma cases are thought to be EBV-associated, with supportive evidence including the presence of EBV-DNA clonally integrated into tumour tissue and serum-epidemiological associations with EBV antibodies.[8]

The variable EBV association in the 3 variants has prompted many to contemplate the possibility of the virus being a passenger in the neoplastic process and not the initiating factor. In all variants, irrespective of EBV status, constitutive activation of the c-*myc* oncogene through its translocation into one of the immunoglobulin loci is clearly the key factor in the oncogenesis of Burkitt's lymphoma.[9]

Burkitt's lymphoma is one of the first human malignancies shown to be curable by chemotherapy alone. A combination of cyclophosphamide, doxyrubicin, vincristine and predinisone is one example of a drug therapy. Radiotherapy is reserved for overt central nervous system disease that is resistant to chemotherapy and is reported to be useful in certain emergencies, such as airway obstruction.

FIG. 1a: Severe facial asymmetry on the right side of mandible

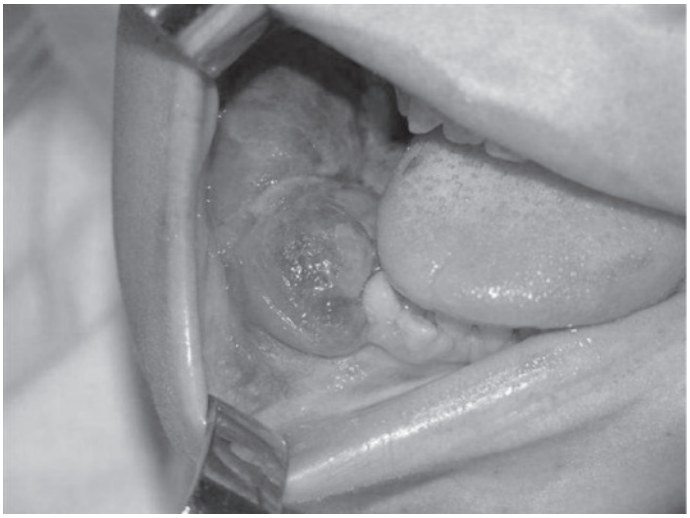

FIG. 1b: Oral lesion in right jaw with a vegetative appearance, diffuse, irregular edges and measuring approximately12x11cm

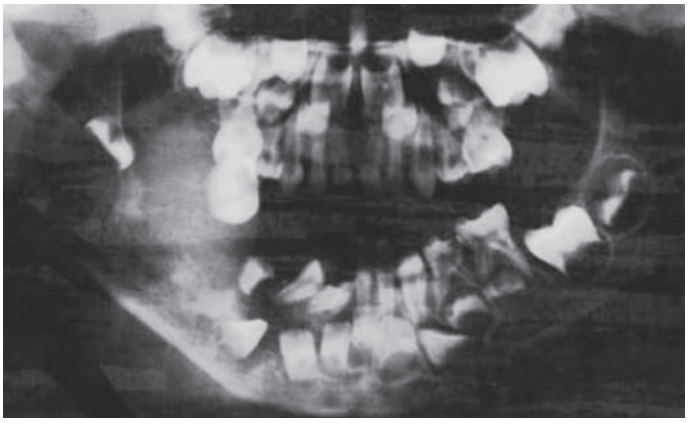

FIG. 2: Radiographically, the lesion was single, radiolucent and with ill-defined margins, causing tooth displacement and resorption of the cortical bone

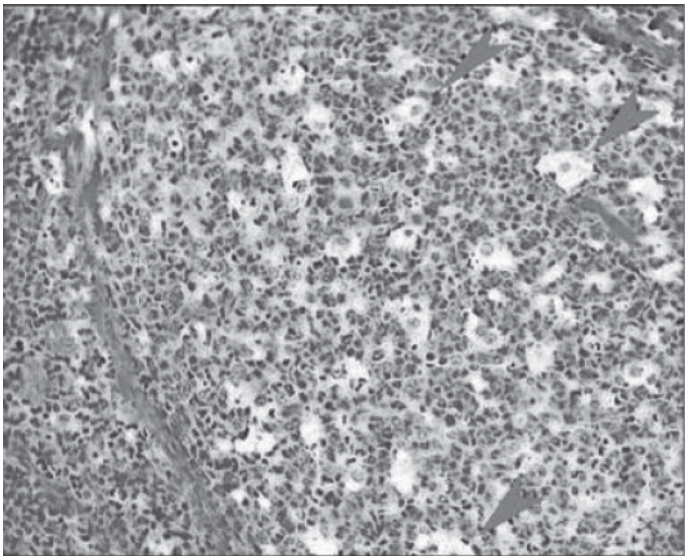

FIG. 3a: Photomicrograph of lesional tissues showed small round cells with scarce cytoplasm and multiple small nuclei interspersed by macrophages in the process of phagocytosis, consistent with diagnosis of Burkitt lymphoma

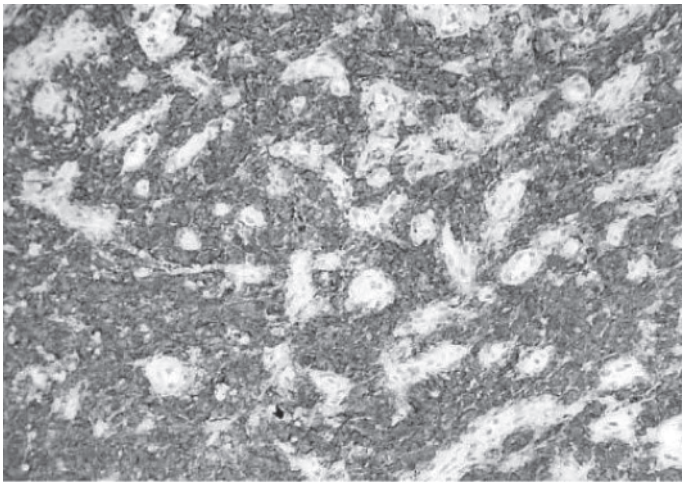

FIG. 3b: Immunohistochemical examination demonstrated diffuse positivity for CD20 in the tumour cell population.

FIG. 4a: Clinical appearance of the patient in remission 11 months after chemotherapy

FIG. 4b: The intra-oral aspect after remission of the lesion

FIG. 4c: The radiographical aspect after remission of the lesion

Bone marrow transplantation may be necessary after completion of chemotherapy cycles. The surgical management of Burkitt's lymphoma is limited to biopsy.[10]

The prognosis of Burkitt's lymphoma depends on the extent of the disease, the patient's age and the timing of diagnosis.[10] The prognosis is excellent for the early stages of the disease (I,II) with event-free survival rates of 85-100%. In the advanced stages (III,IV) the survival rate is 75-85%.[6]

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