Sporadic form of isolated orbital Burkitt lymphoma presenting with fulminant proptosis and dystopia

Mansour Al-Mohaimeed

This is a rare case report of fulminant proptosis with dystopia caused by isolated orbital involvement of nonendemic Burkitt lymphoma. We present the case of a 6-year-old Egyptian child who suffered from progressive, painful proptosis and dystopia in his left eye for 10 days. We discovered a noncompressible, soft-tissue mass at the superotemporal part of the orbit. The presentation of an orbital inflammatory pseudotumor was suspected when the patient was administered with systemic corticosteroids and antibiotics. Histopathological examination of the obtained specimen revealed the “starry-sky” appearance of histiocytes, which is characteristic of Burkitt lymphoma. The patient underwent chemotherapy with remarkable improvement of his dystopia and proptosis. Although orbital Burkitt lymphoma is a rare tumor, ophthalmologists should be aware of its differential diagnosis of rapidly progressive proptosis with dystopia in children, which may initially masquerade as orbital cellulitis or a pseudotumor.

**Key words:** Burkitt lymphoma, dystopia, proptosis

Burkitt lymphoma is a rapidly growing, aggressive malignancy. It is characterized as a high-grade non-Hodgkin's lymphoma of B-cell origin. As a mandibular malignancy, Burkitt lymphoma was initially described in African children, in 1958. It is the first human tumor described to be caused by a virus, the Epstein–Barr virus (EBV). The overexpression of the c-MYC oncogene occurs due to translocation, which in turn disrupts its usual function in controlling cell growth and proliferation. The endemic form is the most common form with a geographic distribution like endemic *falciparum* malaria. The disease mostly occurs in low, warm, and humid lands and almost always found to be associated with EBV infection. It mostly affects the jaw and other facial bones, distal ileum, cecum, kidney, ovaries, or breast. The incidence of immunodeficiency-associated form is similar to that of nonendemic form but is considered clinically more aggressive as it is frequently associated with the invasion of the central nervous system. Among human neoplasms, Burkitt’s lymphoma has the fastest cell doubling time, thus creating special challenges for diagnosis and treatment. In this case report, we present a rare case of fulminant proptosis with dystopia caused by isolated orbital involvement of nonendemic Burkitt lymphoma.

**Case Report**

A 6-year-old Egyptian child was reported with a chief complaint of rapidly progressive, painful proptosis and dystopia in his left eye for 10 days (Figure 1a). The patient was not immunologically challenged. During the examination, a noncompressible soft-tissue mass was felt at the superotemporal part of the orbit without pulsation and thrill. A down-and-in displacement (3 mm) of the globe was detected along with a down-and-in proptosis (2 mm). The pupil was reactive to direct and consensual light, and the fundus was normal in both eyes. Visual acuity was 6/6 in both eyes, and extraocular muscle motility was full in all directions.

A computed tomography scan revealed a homogeneous lump in the upper-lateral part of the left orbit, with the lesion inseparable from the lacrimal gland. In addition, a bilateral maxillary sinusitis with no bone destruction was detected (Figures 2a and b), suggesting the presence of an orbital inflammatory pseudotumor. No other focus of the same lymphoma in other parts of the body was observed. Thus, systemic corticosteroids and antibiotics were prescribed for the patient.

After 5 days of such treatment, the patient’s condition remarkably deteriorated. Visual acuity became 6/24 in the left eye with the limitation of ocular motility, especially on attempted abduction. Displacement and proptosis in the left eye increased to 7 mm and 5 mm, respectively. Left upper eyelid ecchymosis appeared, but no mitosis was observed.

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Tumor debulking with excision biopsy was performed through transcutaneous anterior orbitotomy. Histopathological examination of the obtained specimen revealed “starry sky” appearance, with abundant clear cytoplasm and the presence of multiple, monotonous, medium-sized, highly mitotic lymphoid cells with vesicular basophilic nuclei and prominent nucleoli, which is characteristic of Burkitt’s lymphoma [Figure 3]. Immunohistochemical staining for CD20 (a marker of B-cell differentiation) was positive for the tumor cells, thus confirming the diagnosis. His chemotherapy regimen included two cycles of cyclophosphamide, vincristine, prednisolone, and doxorubicin, resulting in remarkable improvement of his dystopia, proptosis, and ocular motility [Figure 1b]. No regional or distant lymphadenopathies were observed. Visual acuity stayed stable at 6/24 due to exposure keratitis. The child remained in remission for >1.5 years of follow-up.

Discussion

The nonendemic form of Burkitt’s lymphoma is a rare aggressive malignancy, which is less frequently associated with EBV infection, compared to the endemic form, and is typically presented as a painful abdominal mass in children. The mean age of the onset of Burkitt lymphoma is about 12 years, and it is very rare in adults, but the incidence increases at the second and third decades of life. The male-to-female ratio (3.5:1) varies depending on the geographical areas. A few previous case reports have described nonendemic Burkitt lymphoma as an initially masquerading condition that can resemble several different conditions, including conjunctival mass, Tolosa–Hunt syndrome, an orbital pseudotumor, and advanced retinoblastoma. Shields et al. reviewed 1264 patients with orbital masses, out of which, only one case of Burkitt lymphoma was discovered. In our case report, we have described a case of the sporadic form of isolated orbital Burkitt lymphoma with a fulminant presentation involving painful proptosis and dystopia in a 6-year-old child, which was initially masqueraded as an orbital pseudotumor. Because ocular involvement is rare with Burkitt lymphoma, misdiagnosis typically occurs. As a consequence, patients with Burkitt lymphoma are often mistakenly suspected of having infectious and inflammatory diseases of the orbit and are initially administered antibiotics and/or steroids. However, this type of treatment leads to transient improvement or none. The progressive growth over a 2-week period that was observed in the present study was highly suggestive of Burkitt lymphoma – one of the fastest growing malignancies in humans.

However, this lymphoma is curable in many patients who receive good supportive care, which may involve undergoing aggressive forms of chemotherapy (with drugs such as cyclophosphamide, doxorubicin, vincristine, methotrexate, ifosfamide, cytarabine, and etoposide), surgical resection, monoclonal antibody-targeted therapy (with rituximab), radiotherapy, and bone marrow or stem cell transplantation. According to the extremely high mitotic index of Burkitt lymphoma (cell doubling time of 24–26 h), it is necessary to keep the time period between diagnosis and identification of stage and the initial treatment as short as possible. A cure can be achieved in about 80%–90% of those with localized disease and in more than half of the children.
with a disseminated disease. Other treatment options, such as immunotherapy, radiation therapy, and surgical debulking of a tumor, may help improve the prognosis, especially if combined with the recently developed aggressive combination chemotherapy.\[6\]

In conclusion, despite the rare occurrence of the nonendemic form of orbital Burkitt lymphoma, ophthalmologists should be aware of its differential diagnosis of rapidly progressive proptosis with dystopia in children, which may initially masquerade as orbital cellulitis or a pseudotumor.

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Conflicts of interest
There are no conflicts of interest.

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