Case Report

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Burkitt´s Lymphoma with Prior Varicella Infection Presenting with Guillain–Barré Syndrome: A Case Report

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ABSTRACT

Burkitt's lymphoma (BL) emerges as the most prevalent subtype of non-Hodgkin lymphoma (NHL) in pediatric populations. Several studies have demonstrated a connection between certain viral infections and Burkitt's lymphoma, suggesting a potential correlation between these factors. Although BL typically presents with lymph node involvement, neurological manifestations are quite rare.

In this report, we detail the case of a 13-year-old male patient who initially presented with a varicella zoster infection, accompanied by neurological symptoms consistent with Guillain-Barré syndrome (GBS), and subsequently developed a substantial submandibular mass. Diagnostic imaging, along with biopsy, confirmed a diagnosis of high-grade B-cell lymphoma consistent with BL.

Introduction

Burkitt's lymphoma (BL) represents the most prevalent subtype of non-Hodgkin lymphoma (NHL) among children and adolescents, accounting for approximately 50% of cases [1]. Burkitt's lymphoma is an exceedingly aggressive, mature, MYC-driven B-cell non-Hodgkin lymphoma, characterized by rapid cellular proliferation with a doubling time of 24–48 hours [2,3]. Initially identified by Denis Burkitt in 1958 in malaria-endemic regions of Africa, it was first described as a jaw sarcoma in Ugandan children [4]. The average age of onset for sporadic BL is 8 years, with a higher prevalence in males compared to females [5]. The abdomen especially the ileocecal area is the predominant site of involvement, although the ovaries, kidneys, omentum, Waldeyer's ring, CNS, and other sites may also be affected [6–8]. Studies show that neurologic complications are quite rare; specifically, the prevalence of central nervous system (CNS) involvement is reported to be 0.02–0.5% [9].

In this report, we present the case of a 13-year-old boy who initially experienced a varicella zoster infection two months prior and later presented to the emergency room with a large submandibular mass

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and neurological symptoms consistent with Guillain-Barré syndrome (GBS).

Case Presentation

A 13-year-old boy presented to the emergency room with a 6 × 6 cm submandibular mass, which had gradually increased in size over the past month. The mass was neither warm, erythematous, nor painful, but visible edema was noted. The patient had no difficulty breathing.

Upon further inquiry, the patient reported chickenpox-like symptoms two months prior, including a vesicular skin rash, pruritus, and fever. These symptoms were self-limited and resolved within days without pharmaceutical treatment. He also reported difficulty blinking with the left eye, accompanied by pain and tinnitus.

On examination, upward eyebrow movement while looking up was asymmetrical. Other eye movements and physical findings were normal. The neurological symptoms suggested Guillain-Barré syndrome (GBS); therefore, a neurology consultation was arranged.

Laboratory tests and neck soft tissue sonography were performed to evaluate the mass. Sonography revealed three enlarged lymph nodes on the left side of the neck, measuring 21 × 12 mm, 31 × 12 mm, and 28 × 13 mm. These lymph nodes maintained their echogenicity and were identified as hypertrophic and reactive. Radiographs of the adenoids and a chest X-ray were normal, with no signs of inflammation. A spiral neck CT scan revealed a large left anterior cervical solid tumor with central necrosis, extending into the parapharyngeal space. The tumor encased and compressed the left external carotid artery and internal jugular vein, measuring approximately 80 × 65 mm.

Laboratory tests revealed several abnormal results. The white blood cell (WBC) count was elevated at 16.04 × 10^3/μL, with neutrophils also elevated at 14.03 × 10^3/μL (87.5%). Eosinophil levels were low at 0.02 × 10^3/μL (0.1%), and the red blood cell (RBC) count was elevated at 5.34 × 10^6/μL. Mean corpuscular hemoglobin (MCH) was below the reference range at 24.9 pg. Immunoglobulin E (IgE) levels were elevated at 137 IU/mL. Additionally, the CD3 percentage was high at 48.7%, and the CD20 percentage was elevated at 16.3%.

Examination of the cerebrospinal fluid revealed a mild increase in protein without an increase in cell count. A neurology consultation suggested the possibility of third facial nerve paralysis and recommended MRI and EMG-NCV studies, both of which reported no significant abnormalities.

Biopsies from the aforementioned enlarged lymph nodes were obtained and sent for microscopic evaluation. Histomorphologic and immunohistochemical (IHC) findings were compatible with high-grade B-cell lymphoma, favoring a diagnosis of Burkitt's lymphoma, with a recommendation for confirmatory molecular testing for MYC rearrangement. The biopsy sample was re-evaluated by a second pathologist to confirm the diagnosis.

A bone marrow aspiration and biopsy were also performed. The bone marrow aspiration revealed trilineage hematopoietic elements with normal distribution, except for a mild increase in the eosinophilic series.

The patient showed a good response to IVIg therapy (1 g/kg, administered once), with a full recovery from neurological symptoms and a decrease in tumor size with regular chemotherapy. Currently, a serological test has been performed to confirm the diagnosis of chickenpox in the patient, and the IgG level has increased.

Discussion

Burkitt's lymphoma is a highly aggressive form of non-Hodgkin lymphoma, predominantly affecting the abdomen, CNS, ovaries, lymph nodes, and other sites [10–12]. In pediatric cases, sporadic BL typically presents as an extra-nodal abdominal-onset disease, with most children developing a mass in the lower right quadrant of the abdomen, potentially involving the terminal ileum, cecum, ascending colon, or appendix [13–14]. Large cervical adenopathies are less common, and primary involvement of the brain, lungs, liver, spleen, kidneys, and bones is rare, with such manifestations usually indicating advanced disease. In both age groups, survival rates are poor at relapse. Endemic Burkitt's lymphoma characteristically affects the mandible, maxilla, and abdomen. In contrast, sporadic BL often manifests as an abdominal mass involving the mesenteric lymph nodes or ileocecal region, with jaw involvement being rare. The discovery of Epstein-Barr virus (EBV) in tumor samples from an African child seemed to support the viral hypothesis. The incidence in endemic regions is estimated to be 50 times higher than in the United States, with EBV detected in nearly all cases. This variant is universally associated with EBV, suggesting

a direct causative role of the virus in lymphoma pathogenesis. While studies commonly discuss EBV as associated with Burkitt's lymphoma, in this case, the patient had a prior chickenpox-like infection. The zosteriform pattern is rarely reported in some primary malignancies—for example, lung cancer, colon cancer, and hematologic malignancies, including T-cell and B-cell lymphomas—and cutaneous manifestations of Burkitt lymphoma are extremely rare. Various routes of skin metastases have been reported: hematogenous spreading, nearby afflicted lymph nodes, iatrogenic, etc. However, a pattern of zosteriform skin lesions has rarely been reported; to our knowledge, only one case report exists of such a presentation, published in 2020 by Nuntouchaporn Amonchaisakda et al., describing a 78-year-old man with prolonged fever, unexplained weight loss, and an asymptomatic skin rash on the right temporal area and forehead, which was initially diagnosed as varicella-zoster infection [13–15].

Endemic Burkitt's lymphoma primarily affects African children aged 4–7 years, with a male-to-female ratio of 2:1. It involves the bones of the jaw and other facial bones, as well as the kidneys, gastrointestinal tract, ovaries, breast, and other extra-nodal sites. Central nervous system (CNS) involvement is a serious complication of Burkitt lymphoma, with an incidence ranging from 5% to 40%. In relation to the association between GBS and Burkitt's lymphoma, in 2010, Seffo et al. documented a rare case involving a 70-year-old woman diagnosed with T/NK-cell Non-Hodgkin Lymphoma (NHL). During her treatment, she developed Guillain-Barré Syndrome (GBS). The patient experienced bilateral leg weakness and required the use of a wheelchair after undergoing six cycles of CHOP chemotherapy (cyclophosphamide, doxorubicin, vincristine, prednisone). Notably, she did not exhibit symptoms such as numbness, tingling, bladder or bowel dysfunction, or shooting pains. Remarkably, after four cycles of treatment, she achieved complete remission with total tumor regression. This study underscores the rarity of GBS as a paraneoplastic syndrome associated with NHL [13–15].

Conclusion

This report describes a 13-year-old boy who presented with facial edema two months after a chickenpox infection. Following this viral episode, the patient developed neurological symptoms suggestive of Guillain-Barré syndrome, with normal MRI and EMG-NCV findings and a good response to IVIg therapy. However, biopsies of enlarged lymph nodes ultimately confirmed the diagnosis of Burkitt's lymphoma.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

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Conflict of Interests

The authors declare that they have no conflicts of interest.

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