

# Bilateral Ovarian Burkitt Lymphoma in a Female Adolescent, Case Report

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**Abstract:** *Non - Hodgkin's lymphoma (NHL) is a tumor derived from the hematopoietic and lymphoid tissue and is one of the most prevalent malignancies in the pediatric population. It was first described in the 20th century associated with infections, autoimmune diseases, drugs, or genetic predisposing factors. The incidence can vary in different regions of the world, with a higher prevalence in low and middle - income countries and higher frequency in males compared to females. Burkitt's lymphoma (BL) is a subtype of non - Hodgkin's lymphoma and rarely has been described with ovarian infiltration. We present a case report of a female adolescent diagnosed with bilateral ovarian Burkitt lymphoma with liver and central nervous system metastasis.*

**Keywords:** Burkitt lymphoma, non - Hodgkin lymphoma, Metastasis

## 1. Introduction

Burkitt's lymphoma is a type of cancer that affects the lymphatic system. It is more common in children than adults and is classified as a lymphoproliferative neoplasm. It has been associated with Epstein Barr virus, plasmodium falciparum, some medications such as phenytoin, genetic syndromes, and autoimmune diseases [5, 6]. Although pediatric oncologists widely study this pathology, in many cases, poor health systems, particularly in low - income countries, are linked to delayed diagnosis. [7]. The main reason for publishing this article is to familiarize practitioners so they can make an earlier intervention.

## 2. Methodology

The methodology of this case report involves a comprehensive review of the clinical history of a female adolescent patient with bilateral ovarian Burkitt lymphoma, combined with a relevant review of the literature in databases such as PubMed, Medline, and Embase to explain these findings.

## 3. Case Report

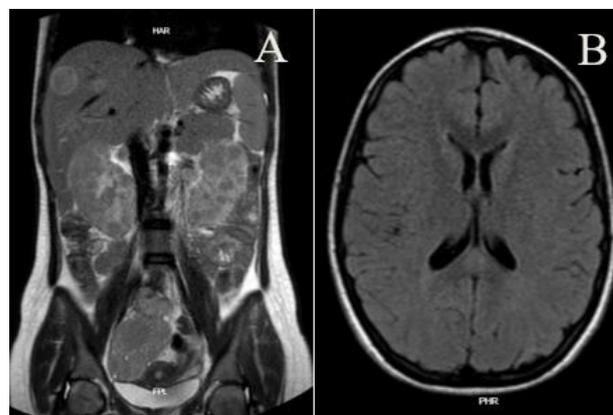
A 15 - year - old female adolescent with no significant previous history consulted the emergency department with 3 - day dysarthria and dysphagia, accompanied by tongue paresthesia. On physical examination, the patient had facial symmetry, centered uvula, Hypoesthesia in the right mandibular area, lower lip, and tongue with protrusion impairment. As a positive finding, an abdominal mass in the hypogastric region was also palpable at examination.

The initial blood test showed normochromic - normocytic anemia and increased uric acid. Biomarkers such as alpha - fetoprotein and chorionic gonadotropin were negative along with the bone marrow biopsy and flow cytometry. Abdominal

MRI revealed five nodular heterogeneous images in the liver and at both ovaries, a solid mass. The brain MRI also showed a focal supratentorial lesion that involved the corpus callosum with flow cytometry of spinal fluid in favor of lymphomatous involvement lineage B.

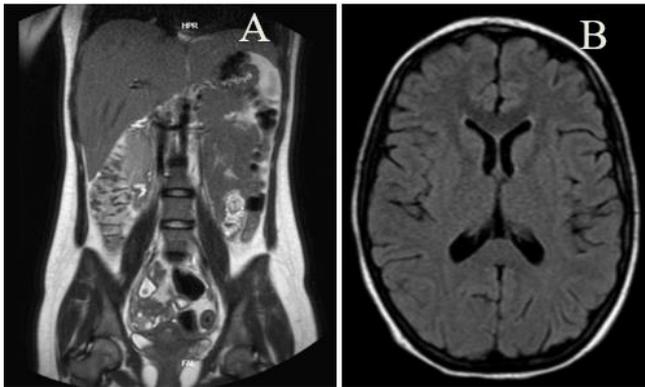
The patient underwent a laparoscopic left oophorectomy. The biopsy indicated a high - grade diffuse lymphoma with morphology suggestive of Burkitt lymphoma. Immunohistochemistry markers confirmed the diagnosis with solid positivity for CD10, CD19, CD20, and C - MYC with Ki67 of 95%. Chemotherapy was started with BFM protocol for lymphomas.

In the following controls, flow cytometry of the spinal fluid was negative, along with an MRI of the brain and abdomen without any residual tumor (see Figure 2). Four months after starting chemotherapy, the patient is in good general condition, currently without any data that suggests malignant disease.



**Figure 1:** Patient images at the time of diagnosis A) Contrast - enhanced magnetic resonance imaging of the pelvis: Multiple solid - looking lesions are observed in the pelvis, the largest in the left inguinal region measuring 100

mm x 59 mm B) Brain MRI: A focal lesion measuring 13 mm x 18 mm is observed at the supratentorial level involving the splenium of the corpus callosum.



**Figure 2:** Images of the patient after four months of treatment A. Contrast - enhanced magnetic resonance imaging of the pelvis: Empty endometrial cavity, right ovary measuring 23 x 28 mm with images of follicular appearance (study without evidence of malignancy) B. Brain MRI: parenchyma without evidence of focal lesions

#### 4. Discussion

Burkitt's lymphoma was first described by Denis Burkitt in 1958 while observing tumors with jaw malformation in Uganda, Central Africa [1]. It falls under the group of mature B - cell non - Hodgkin's lymphomas and is highly malignant, with the most dreaded complication being the tumor lysis syndrome leading to acute kidney failure and death [2, 3]. It is classified by the world health organization (WHO) based on its clinical presentation into three groups: endemic, sporadic and immunodeficiency - related [4, 5].

The endemic form is linked to malaria and Epstein Barr virus (EBV) and the immunodeficiency - related variant is associated with HIV and organ transplantation [5, 6]. It can also be linked to chromosomal translocations that cause the overexpression of oncogene c - myc. The MYC family is composed of regulator genes and oncogenes that encode transcription factors that regulate the cell cycle. Translocations of the c - Myc gene on chromosome 8 is the hallmark of BL, occurring in approximately 95% of cases [6, 7].

Burkitt's lymphoma (BL) incidence is low, accounting for only about 1% to 5% of all non - Hodgkin lymphomas. Like most types of lymphoma, BL is more common in males, with a male - to - female ratio of 3 - 4 to 1 [7]. According to Derqaoui et al. [4], the disease is most commonly presented in patients between the ages of 2 and 10 years, accounting for 66.7% of cases. The frequency was higher in men at 77.2%, compared to 22.8% in women. These findings differ significantly from our patient who was diagnosed at 15 years of age.

In addition, our patient debuted with neurological symptoms such as dysarthria and paresthesias. There are few reports in literature of neurological manifestations at BL diagnosis. Soyland DJ et al [1] reported a Burkitt - type primary tumor in a 3 - year - old patient with neurological manifestations due

to acute primary paraspinal myelopathy, total inability to walk, and absence of deep tendon reflexes. Although our patient presented neurological symptoms due to CNS infiltration, we can infer that her clinical outcome was favorable, given the early intervention after diagnosis. There have been case reports of individuals beyond pediatric age who have shown CNS involvement due to BL. For instance, Yu - Sub - Kim et al [8] described a 69 - year - old patient with progressive neurological symptoms. The patient had a dumbbell - shaped epidural mass extending from L2 to L3, which was suggestive of a neurogenic tumor. However, histopathological study confirmed BL, indicating that CNS involvement can occur at any age, whether primary or secondary.

There are only a few known cases of primary bilateral ovarian Burkitt Lymphoma in pediatric patients. De Soto et al. [9] reported a similar case to ours, where a bilateral ovarian tumor was present without any involvement of the central nervous system or surrounding abdominal organs. The patient had a favorable prognosis after two years, responding well to surgical and chemotherapy treatments. According to the literature, the prognosis for adults is different from children, Briseño Hernández et al [10], reported the case of a 31 - year - old female patient with a bilateral ovarian Burkitt lymphoma and a poor prognosis, unfortunately, the patient passed away just two months after being diagnosed. In our case, the clinical outcome was satisfactory, and after 4 months of chemotherapy, there were no signs of tumors or metastases in either the CNS or the liver. Therefore, we believe that the prognosis for Burkitt's lymphoma is favorable during adolescence if it is treated early. However, strict follow - up is necessary due to the high risk of recurrence of all NHLs.

#### 5. Conclusions

Bilateral ovarian Burkitt lymphoma in pediatric age is a rare form of tumor that has been associated with many environmental and intrinsic factors. Knowing this disease can significantly improve the prognosis if immediate treatment is initiated. Hence, it is crucial to understand when to refer to specialized consult.

#### 6. Future Scope

Our case of Burkitt's lymphoma analyzes the complexity of this malignant entity that can cause systemic dissemination. The involvement of a multidisciplinary team is essential in making an appropriate diagnosis and treatment. Furthermore, this information contributes to updating knowledge on pediatric oncology and raising awareness among the medical team to consider this diagnosis.

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