

Diffuse Large B Cell Lymphoma of the Neck with Secondary CNS Involvement in Newly Diagnosed HIV Positive Patient

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Abstract

Central nervous system (CNS) involvement by diffuse large B-cell lymphoma (DLBCL) is uncommon, particularly when it presents with features mimicking chronic subdural hematoma. Secondary CNS lymphoma often develops in immunocompromised patients and poses diagnostic and management challenges. We report the case of a 23-year-old newly diagnosed HIV-positive patient who presented with severe headaches of two weeks' duration, vomiting for two days, and confusion for one week. The patient also reported systemic symptoms including fever, involuntary weight loss, and night sweats. History included blunt head trauma three weeks prior. Examination revealed disorientation. Imaging demonstrated a left-sided chronic subdural collection with underlying bony erosion and marked degenerative changes, with part of the calvarial bone absent. Surgical exploration through a curvilinear scalp incision revealed gelatinous tissue and caseous material beneath the scalp, with erosion extending through the skull to the dura. Following cauterization and cruciate dural incision, 80 ml of chronic subdural collection was evacuated. Histopathological examination confirmed diffuse large B-cell lymphoma (DLBCL) of the neck with secondary CNS involvement. This case highlights an unusual presentation of secondary CNS lymphoma with subdural collection and extensive cranial bone destruction in the context of newly diagnosed HIV infection. It underscores the importance of considering lymphoproliferative disorders in the differential diagnosis of atypical subdural lesions, especially in immunocompromised patients. Early recognition and tissue diagnosis are crucial for timely initiation of appropriate therapy and improved outcomes.

Keywords: Diffuse Large B-cell Lymphoma, Secondary CNS Lymphoma, Chronic Subdural Collection, HIV, Bone Erosion.

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Abbreviations

CNS: Central Nervous system

DLBCL: Diffuse Large B-cell Lymphoma

HIV: Human immunodeficiency virus

NHL: Non-Hodgkin Lymphoma

PLWH: People Living With HIV

R: CHOP-Rituximab Cyclophosphamide, Hydroxydaunorubicin, Oncovin, prednisolone

CHOP: Cyclophosphamide, Hydroxydaunorubicin, Oncovin, prednisolone

CSF: Cerebrospinal Fluid

CD4: Cluster of Differentiation 4

HAART: Highly Active Antiretroviral Therapy

EBV: Epstein-Barr Virus

SCNCL: Secondary Central Nervous System Lymphoma

LDH: Lactate Dehydrogenase

IT: Intrathecal

MTX: Methotrexate

HD-MTX: High Dose Methotrexate

Introduction

Diffuse large B-cell lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphoma (NHL), accounting for substantial morbidity and mortality in both immunocompetent and immunocompromised populations. Extranodal involvement is frequent in

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DLBCL, affecting sites such as the central nervous system (CNS), bone marrow, and gastrointestinal tract; however, presentation as a scalp, skull, and subdural mass remains exceptionally rare [1,2]. Similarly, cranial vault lymphoma mimicking subdural hematoma poses diagnostic challenges, especially in patients with prior head trauma [2]. In persons living with HIV (PLWH), the risk of aggressive lymphoma with CNS involvement increases significantly, with de novo CNS disease reported in up to 13% of cases and associated with dismal prognosis without prompt intervention [3-5]. Secondary CNS DLBCL carries particularly poor survival, with median overall survival frequently under a year even when treated aggressively [5,6]. In this report, we present a rare case of diffuse large B-cell lymphoma manifesting as a scalp mass, skull erosion, and subdural collection in an HIV-positive patient with chronic head trauma. The clinical and radiological findings initially suggested an infectious or traumatic subdural hematoma. However, intraoperative discovery of caseous, gel-like material and histopathological analysis ultimately revealed DLBCL with secondary CNS involvement. This case underscores the importance of maintaining a broad differential diagnosis in immunocompromised patients presenting with subdural masses, even in the setting of trauma, and highlights the imperative of histological confirmation for appropriate management.

Case

We report the case of a 23-year-old male university student, newly diagnosed with HIV infection, who presented with a 2-week history of severe headache, 2 days of vomiting, and 1 week of progressive confusion. He also reported fever, night sweats, and involuntary weight loss. There was a background history of blunt head trauma three weeks prior. On examination, the patient was disoriented but had no focal neurological deficits. Notable findings included scalp swellings, skin lesions over the torso and limbs, and inguinal lymphadenopathy. Neuroimaging revealed a chronic left subdural collection with underlying bony erosion, degenerative calvarial changes, and partial absence of cranial bone. Surgical exploration through a curvilinear incision exposed gelatinous and caseous material beneath the scalp, with erosion extending through the skull to the dura. Evacuation of approximately 80 ml of chronic subdural collection was performed following dural incision. Histopathological analysis confirmed diffuse large B-cell lymphoma (DLBCL) with secondary central nervous system (CNS) involvement. Staging CT imaging showed a large retro auricular scalp-based tumor ($7.6 \times 3.2 \times 6.7$ cm) extending to the angle of the mandible and a left infratemporal fossa mass (4.2×2.7 cm), with no evidence of thoracic, abdominal, or pelvic disease. This case highlights an unusual presentation of secondary CNS lymphoma manifesting as a chronic subdural collection with calvarial bone destruction, in the setting of newly diagnosed HIV infection.



Figure 1: Posterior auricular lesions

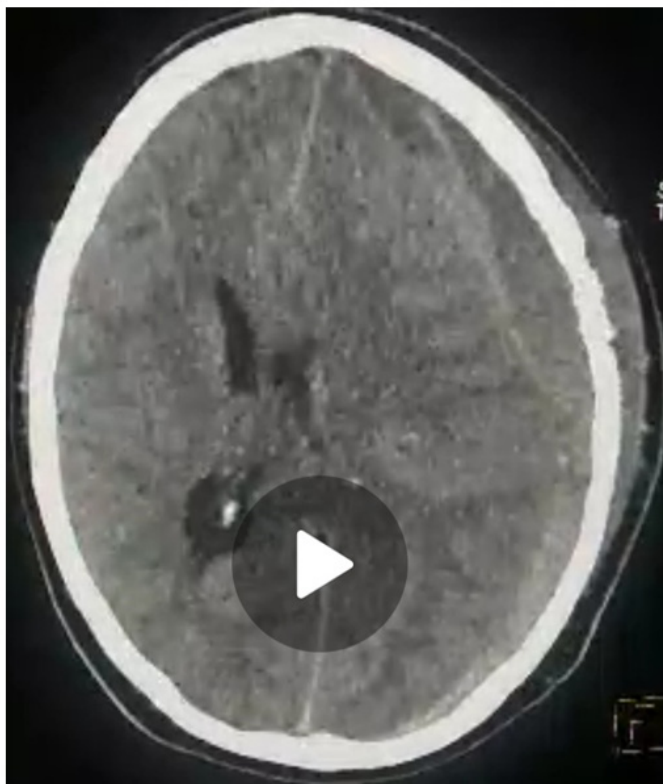


Figure 2: CT scan brain axial view showing, left sided soft tissue swelling, chronic subdural, effacement of ventricle and midline shift

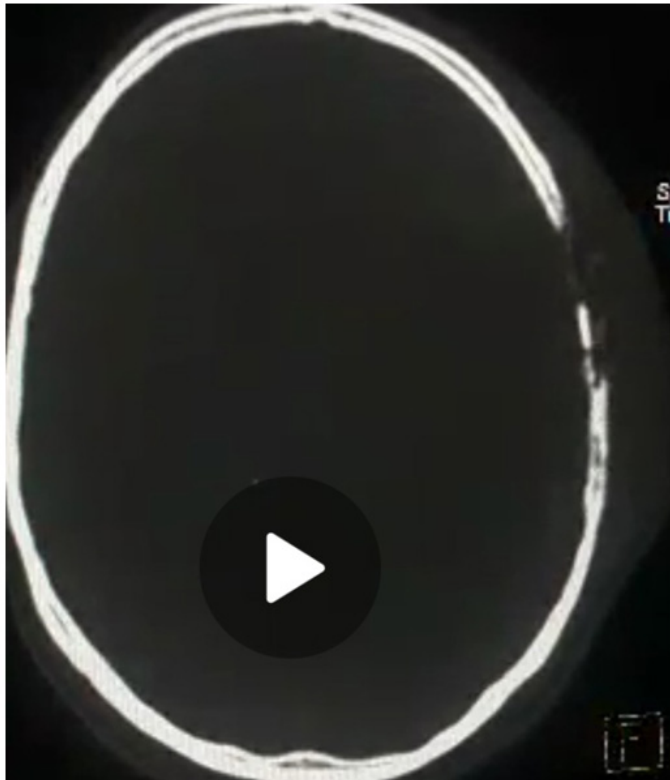


Figure 3: CT scan bone window showing left side bone erosion

Surgical Management

The patient was positioned supine with the head tilted 15 degrees to the right. A small curvilinear incision was planned, and local anesthesia was administered. Upon performing the scalp incision, gelatinous lumps and caseous material were observed beneath the scalp. The underlying skull was found to be eroded down to the dura. The dura was cauterized, and a cruciate incision was made, allowing evacuation of 80 ml of chronic haematoma. Samples were collected for histopathological analysis.

Medical Management

Given the diagnosis of diffuse large B-cell lymphoma (DLBCL) with secondary CNS involvement in the context of newly diagnosed HIV infection, several treatment strategies were considered which included:

1. R-CHOP combined with intrathecal methotrexate and cytarabine, readily available but not ideal in terms of CNS disease control.
2. R-CHOP combined with high-dose methotrexate, more effective, though limited by lack of facilities for serum methotrexate level monitoring.
3. R-CHOP combined with high-dose cytarabine, potential option but with uncertain efficacy.
4. Chemotherapy with whole-brain radiotherapy, was not currently feasible due to unavailable radiotherapy services at the institution

The patient was commenced on CHOP regimen, which was; cyclophosphamide (1300 mg IV stat), vincristine (2 mg IV stat), doxorubicin (90 mg IV stat), and prednisolone (70 mg orally once daily for five days). Supportive therapy included ondansetron (4 mg PO daily for five days), paracetamol (1 g

PO three times daily for one week), allopurinol (300 mg PO stat followed by 200 mg daily for one month), and omeprazole (20 mg PO twice daily for one month). To prevent CNS relapse, there was need for chemotherapy with good penetration into the cerebrospinal fluid (CSF). Additionally, initiating Rituximab was not feasible as the CD4+ count was below 50. Therefore, HAART was crucial and initiated. Initial treatment with CHOP was commenced and therapy escalated as from the second cycle.

Discussion

This case represents an unusual and aggressive presentation of diffuse large B-cell lymphoma (DLBCL) in a newly diagnosed HIV-positive 23-year-old, with secondary CNS involvement manifesting as a chronic subdural collection, extensive skull (calvarial) bone destruction, and extracranial scalp masses. DLBCL is among the most common HIV-associated non-Hodgkin lymphomas, often presenting with systemic (“B”) symptoms, extranodal involvement, and more aggressive disease than in HIV-negative patients [7]. HIV infection causes chronic immune activation, impaired cytotoxic control, especially of EBV, and B-cell proliferation, predisposing to oncogenesis [8,9]. Calvarial lymphoma, especially with bone destruction, is rare but has been documented, sometimes after trauma [8,10]. The mechanism of skull involvement might include infiltration along emissary veins or via diploic spaces, eventually causing osteolytic changes and cortical destruction. In a recent systematic review of cranial vault lymphoma, osteolytic skull changes were found in the majority of cases, though often disproportionate to soft-tissue mass growth [11]. Our patient’s presentation—a scalp mass, calvarial erosion seen on imaging and at surgery, and CNS extension—is consistent with this pattern, though the timeline (weeks rather than months) suggests very aggressive behavior or possibly a synergistic effect of immunosuppression.

A history of blunt trauma prior to presentation is notable. While causation is not established, trauma has been reported in case reports of cranial vault lymphoma, possibly acting as a local trigger for inflammation and creating opportunities for tumor cells to exploit altered vascular or tissue integrity [12]. This case highlights the diagnostic complexity of lymphoma with CNS involvement in HIV. Imaging findings were atypical for a simple subdural collection (chronic subdural hematoma) due to the presence of caseous/gelatinous material, bone destruction, scalp masses, and early CNS manifestations such as confusion, raised intracranial pressure. The lack of focal neurological deficits is interesting; often CNS lymphomas present with focal deficits, but subdural or epidural extension can compress diffusely. Histopathology remains indispensable, both to confirm diagnosis and to subclassify lymphoma for germinal centre B-cell vs non-GCB as well as EBV involvement, which have prognostic and therapeutic implications. Recent guidelines emphasize early tissue diagnosis [13].

The literature establishes that HIV-associated DLBCL tends to have poorer baseline features such as advanced stage, elevated LDH, extranodal disease, and sometimes low performance status [14]. CNS involvement further worsens prognosis. Secondary CNS lymphoma (SCNSL) carries high risk of mortality [15]. Calvarial involvement correlates with more aggressive disease, extensive tumor burden, and potential for complications

However, reported survival among cranial vault lymphoma cases varies depending on how early diagnosis is made, extent of disease, HIV control, and treatment resources [11,16].

DLBCL patients with risk factors such as extranodal disease, bone involvement, HIV infection, large mass burden are known to have elevated risk of CNS relapse or overt CNS disease [13,17]. We had various treatment options for our case, and each option has its upside and downside and a balance had to be struck. Intrathecal (IT) chemotherapy of methotrexate and or cytarabine is widely used for CNS prophylaxis in high-risk DLBCL. However, its efficacy is somewhat mixed, especially in preventing parenchymal brain relapse [15,18]. High-dose intravenous methotrexate (HD-MTX) offers better CSF and brain parenchyma penetration, but is more toxic, requires close monitoring, and may require resources (renal function, drug level monitoring) that may not be available in all settings [19]. While high-dose cytarabine has been used in some regimens, alone or in combination, but evidence is less robust [20]. Combined systemic plus CNS-directed therapy, often in the form of R-CHOP plus IT or high-dose agents, is the standard approach in many centers for cases with established CNS involvement or very high risk. Guidelines recommend systemic CNS-penetrant agents + intrathecal therapy [19]. Recent reviews on CNS prophylaxis in DLBCL showed that IT MTX or HD-MTX both reduce risk of CNS relapse, especially early relapse, but benefits wane over time, and risk reduction is more modest for parenchymal disease compared to leptomeningeal disease [21].

In our setting, limitations include lack of facility to monitor methotrexate levels, nonfunctional radiotherapy services, and possibly limited access to rituximab if CD4+ count is very low. These constrain ideal therapy. Our approach of starting with CHOP (cyclophosphamide, doxorubicin, vincristine, prednisolone) is reasonable in such a context. CHOP is a standard backbone in DLBCL therapy. Adding CNS-directed therapy via IT or systemic high-dose agents in subsequent cycles is aligned with published strategies for secondary CNS involvement. Use of supportive measures such as antiemetics, tumor lysis prophylaxis with allopurinol, gastric protection, is essential, particularly in HIV, where comorbidities increase risk of complications. Initiation of antiretroviral therapy (HAART) is critical. HIV-associated lymphomas often respond better when immune function can recover. Moreover, HAART reduces risk of opportunistic infections, which are part of the differential diagnosis and contribute significantly to morbidity.

HIV-associated DLBCL with CNS involvement often has poorer prognosis compared to immunocompetent patients. Early diagnosis, aggressive combination therapy, and access to CNS penetrating agents improve outcomes [18]. Absence of radiotherapy may impair local control in certain lesions, especially with bone destruction or skull involvement. Some reports show benefit from adding surgery plus radiotherapy plus chemotherapy in HIV-associated CNS lymphoma [20].

Limitations

Lack of CD4+ count at baseline restricts accurate estimation of immune status and potential risk of infections vs. lymphoma

progression. Resource limitations for example methotrexate drug level monitoring, radiotherapy, necessitate adaptation and balancing risk vs benefit. Lack of flow cytometry of CSF for detecting leptomeningeal involvement; diagnosis via cytology alone may miss disease.

Conclusion

This case illustrates an uncommon presentation of secondary CNS lymphoma manifesting as a chronic subdural collection with extensive calvarial bone destruction in the context of newly diagnosed HIV infection. The overlap of infectious and neoplastic processes in immunocompromised patients presents unique diagnostic and therapeutic challenges. Early surgical intervention, histopathological confirmation, and timely initiation of systemic chemotherapy are critical to guide management. In resource-limited settings, stepwise escalation of therapy, integration of HAART, and multidisciplinary collaboration remain essential for optimizing outcomes.

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