ISSN: 2996-2544

Case report

Journal of Research and Education

Oropharyngeal Burkitt Lymphoma Masquerading as Oropharyngeal Carcinoma in An Adult: A Diagnostic Challenge

Sudeep KC[1*] and Himani Poudyal[2]

[1]*Department of Radiology, Patan Academy of Health Sciences. Lalitpur, Nepal*

[2]*Department of Internal Medicine, Dhulikhel Hospital, Nepal*

[*]Corresponding Author
Sudeep KC, Department of Radiology, Patan Academy of Health Sciences. Lalitpur, Nepal

Submitted: 2024, Mar 12 ; **Accepted**: 2024, Apr 15: **Published**: 2024, Apr 24

Citation: Sudeep, K. C., Poudyal, H. (2024). Oropharyngeal Burkitt Lymphoma Masquerading as Oropharyngeal Carcinoma in An Adult: A Diagnostic Challenge. *J Res Edu, 2*(1), 01-04.

Abstract

Burkitt Lymphoma (BL) is a highly aggressive B-type non-Hodgkin lymphoma typically manifests in cervical lymph nodes or facial bones, making oropharyngeal involvement unusual. The lesion clinically mimicked oropharyngeal carcinoma; MRI revealed homogenously enhancing mass lesion in oropharynx/tonsillar fossa which was later histopathologically proven as oropharyngeal Burkitt Lymphoma. Successful treatment involved six cycles of chemotherapy, resulting in complete remission and followed up for 6 months without any recurrence.

Keywords: Burkitt Lymphoma, Oro- pharynx, Immunohistochemistry ,Whenever an Enlarging Mass Is Seen in Oropharynx, Possibility of Lymphoma Should Be Considered, Timely Diagnosis of Burkitt Lymphoma Is Crucial for Prompt Intervention, Early Diagnosis, Imaging, Immunohistochemistry, Intensive Multiagent Chemotherapy Remain Pivotal in Achieving Favorable Outcomes for Patients

1. Introduction

Burkitt lymphoma (BL) is a non-Hodgkin B-cell lymphoma derived from germinal center lymphoid B cells; named after Dennis Parsons Burkitt, an Irish surgeon who first described it as sarcoma of jaws in children from equatorial Africa in 1958 [1]. Burkitt lymphoma accounts for 1–5% of all non-Hodgkin lymphoma cases. It is uncommon in adults and usually involves the gastrointestinal system, central nervous system or the head-and-neck region. Sporadic Burkitt's lymphoma is relatively rare in the head and neck region, accounting for about 25% of all cases [2]. Burkitt's lymphoma is the fastest-growing tumour in humans, with a cell-doubling time of about 24–48 hours [3]. The etiology of this tumor is debatable, but strong evidence implicates Epstein-Barr virus in its development [4]. Three distinct forms of Burkitt's lymphoma have been described; each of them having own clinical and epidemiological features. Multi-agent chemotherapy is the mainstay of Burkitt's lymphoma treatment [5]. This case report presents the diagnostic challenges encountered in identifying oropharyngeal Burkitt lymphoma (BL) in a 41- year-old male who initially presented with mass lesion in oropharynx. Owing to rarity of BL in the oropharynx, this case underscores the importance of considering rare malignancies in atypical presentations and highlights the role of comprehensive diagnostic approaches in clinical management.

2. Case Presentation

41-year, male, smoker 15 pack year, occasional alcohol drinker, with no prior co-morbidities and notable previous medical history presented to the Otolaryngology Clinic with complaints of sore throat and something stuck in right side of throat for 2 months. He had no history of fever, night sweats, dysphagia, odynophagia and difficulty in breathing. On examination of the oral cavity, polypoidal pinkish-white colored tissue mass lesion was seen in right side of the oropharynx. Rest of the clinical examination were unremarkable.

2.1 Methods

2.1.1 Differential Diagnosis

On the basis of history and clinical examination, following differential diagnosis were considered.

- Oropharyngeal carcinoma
- Lymphoma

3. Investigations:

3.1 Imaging Findings:

In suspicion of oro-pharyngeal malignancy, the patient underwent CE MRI of neck which showed a homogenously enhancing well circumscribed lobulated T1 hypointensity and T2 hyper intensity lesion measuring 4.0 x 2.8 x 2.0cm involving the right side of the oropharynx and tonsil(Fig 1). The lesion was causing partial effacement of the right side of vallecula, without midline extension of the lesion noted. No extension of the lesion beyond the confinement of oropharynx seen. Diffusion restriction noted with ADC value of 0.4 x 10^-3mm2/sec on b value of 800. Patient

was counselled about the possibility of malignant lesion and was advised for biopsy to rule out malignancy. Punch biopsy was done and histopathology followed by immunochemistry and Interphase fluorescence in situ hybridization (FISH) confirmed it as case of Burkitt Lymphoma.

Microscopic Findings showed multiple fragments of tissue, partially lined by non-keratinized stratified squamous epithelium. Sub epithelium showed infiltration by monotonous population of atypical lymphoid cells. Those atypical lymphoid cells were intermediate to large in size with round to ovoid with coarse chromatin, irregular nuclear membrane, scant cytoplasm. Cytoplasm was scant in amount. Immunohistochemistry showed atypical lymphoid cells which were diffusely positive for CD45, CD20, PAX-5, CD10, BCL6 (weak), MUM-1, c-MYC (45%), while they are negative for CK (AE1/AE3), CD3, BCL2, Cyclin-D1, CD21 and CD34. Ki67 proliferation index is approximately 90%. Thoracic abdominal and pelvic CT scans did not show any distant extension of the disease. Bone marrow aspiration and biopsy showed normocellular marrow. The complete blood count was unremarkable. Human immunodeficiency virus (HIV) serology was negative. Serology testing was positive for anti-Epstein–Barr virus IgG.

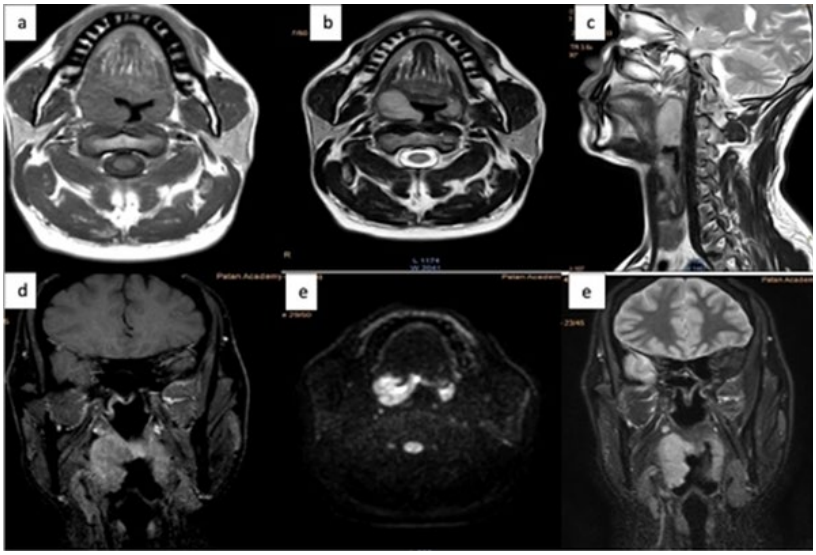

Figure 1: Plain and contrast MRI showing well defined lesion in right side of oropharynx/ tonsil demonstrating T1 isointensity (a), T2 hyperintensity (b,c) with mild diffusion restriction(e). Post contrast study shows mild and homogenous enhancement on post contrast study(d,f)

4. Treatment, Outcome and Follow up:

He was stared on R-Da-EPOCH regimen(Rituximab, etoposide phosphate, prednisone, vincristine sulfate (Oncovin), cyclophosphamide, and doxorubicin hydrochloride (hydroxydaunorubicin). CT scan following the 6th cycle showed a complete regression of lesion(figure 2)

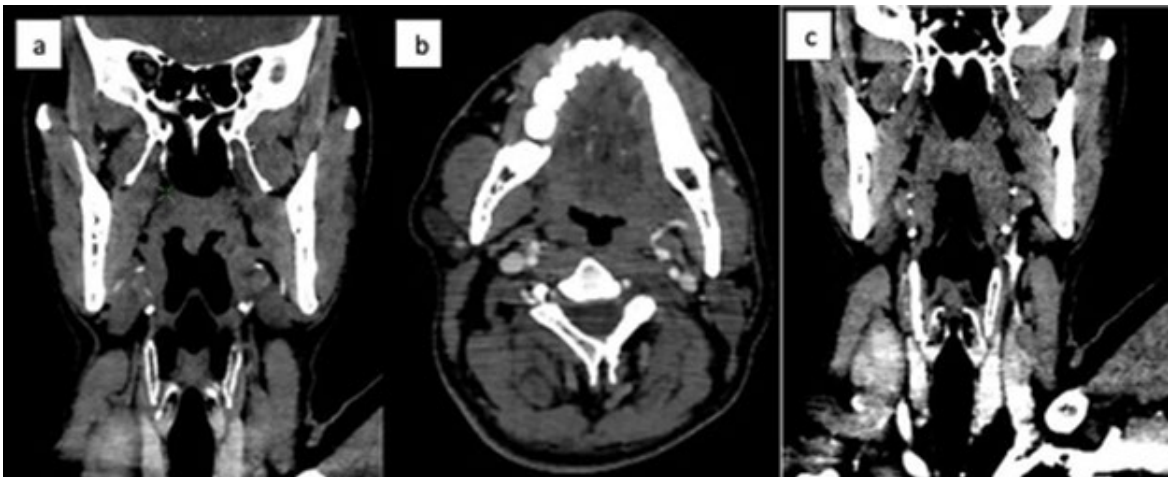

Figure 2: Post treatment Coronal (a and c) and axial(b)CECT of neck shows no obvious abnormally enhancing lesion at right oropharynx and tonsillar region.

5. Discussion

Lymphoid neoplasm encompasses group of white cell neoplasm varying in clinical presentation and behavior; *Leukemias* arising in bone marrow and circulating peripheral blood, *lymphomas* appearing as tumour masses from lymph nodes or other organs and *plasma cell dyscrasias* composed predominantly of plasma cells. Sometimes, distinction between these clinical categories of lymphoid neoplasia is difficult [6]. Lymphomas are divided into two major group; Hodgkin and Non-Hodgkin lymphoma. The non-Hodgkin lymphomas are further sub-divided into B-cell and T-cell lymphomas. Burkitt's Lymphoma belongs to peripheral B cell neoplasm [7]. There are 3 different types of BL: endemic (African) form, the sporadic (non-African) form and immunodeficiency-linked variety. The endemic form, which is the most prevalent worldwide; affects younger children (4 to 7 years) involving the head and neck (maxilla and mandible involvement in 58%). Concomitant (endemic) malaria (or other infections) impairs immune competence; allowing sustained B cell proliferation commonly seen in this variant [8]. Symptoms include cervical lymphadenopathy, swelling of the jaw or facial mass, proptosis, teeth mobility, paresthesia, and pain [9]. Sporadic Burkitt's lymphoma (usually seen in European populations) shows gastrointestinal involvement (56% of the cases) and is found more often in older children(male> female). Both endemic and Sporadic Burkitt's lymphoma rarely arises in the lymph nodes. Immunodeficiency associated Burkitt lymphoma is frequently seen in AIDS patients and patients on immunosuppressive drugs following organ transplantation and can be found in extra-nodal sites; abdomen being common site. Abdominal pain, vomiting, bowel obstruction and gastrointestinal bleeding constitutes the usual clinical presentation [10]. Manifestations of BL are variable depending on the site of involvement and the extension toward the adjacent structures. Sometimes, systemic symptoms such as fever, weight loss, and headache might be seen [11]. Rapid progression of symptoms can be seen that can even reach 24 to 48 hours [9]. Our patient mainly presented with sore throat and foreign body sensation in the throat that was attributed to the oropharyngeal extension. In fact, symptoms in oropharyngeal BL are not specific to this entity and can delay the diagnosis, since BL mainly manifests with cervical lymphadenopathy. Physical examination findings can also be misleading as oropharyngeal BL typically presents as a polypoid mass resembling other tumorous condition [9].

Although the diagnosis of BL is confirmed pathologically, multimodality imaging approach imaging plays a critical role throughout the clinical course from diagnosis to follow up imaging [12]. According to the National Comprehensive Cancer Network (NCCN) guidelines, initial staging should be performed with cervical and abdominal ultrasound, CT of the chest, abdomen, and pelvis. Depending on the clinical presentation, contrast-enhanced neck and/or brain MRI may also be done [12]. CT scan is a crucial to assess tumor localization, staging of the disease and post-treatment monitoring. Currently, Gadolinium enhanced MRI is also the best imaging modality for confirming oropharyngeal location, extension, its relationship to the adjacent structures, and follow-up of BL. Compared with CT, MR imaging can demonstrate homogenously enhancing mass with isointense signal on T1-weighted images and an iso or hyper-intense signal on T2-weighted images due to the cellularity and tends to infiltrate surrounding structures without their destruction, especially in sporadic forms. In contrast, endemic variants are characterized by osteolytic bone lesion with destruction of maxilla-facial bones with an enlargement and invasion of the adjacent structures [13]. Our patient also presented as an infiltrating homogenous mass with a hypo-intense signal on T2-weighted images. However, CT and MRI findings are not specific to this entity, and their findings can mimic other aggressive diseases of the oropharynx. Role of diffusion weighted imaging (DWI) and ADC value in BL is still under study. Positron emission tomography (PET), when combined with CT, offers the advantage of combining functional information with anatomic imaging.[14]An increasing amount of research is being done to assess the value of PET/CT in patients with BL and should be performed if possible, provided it will not delay treatment [12]. Biopsy, immunohistochemistry and genetic analysis are other tests helpful to get correct diagnosis. All variants of Burkitt lymphoma share the same morphology and it is almost impossible to differentiate these three variants on microscopic features alone. They are strongly associated with translocations involving the *MYC* oncogene on chromosome 8. Histopathology, BL typically has characteristic starry-sky pattern. However, immunohistochemistry is a useful method for identifying particular tumor cells that includes expression of CD20, CD10, and bcl-6, Ki-67 proliferation rate [15].

Bone marrow, Cerebrospinal fluid, Lactate Dehydrogenase Level, HIV and Epstein-Barr Virus serology may also be required [16]. EBV exhibits strong tropism for B cells and infects them, causing them to proliferate. In our case, the patient had positive antibodies for Epstein–Barr virus. Virtually all cases of endemic BL carry EBV genome whereas < 30% of sporadic and immunosuppression-associated variant are associated with this EBV virus [17]. The definitive treatment of BL is often based on the patient's age and the location of tumor. Different modalities such as surgery, radiotherapy, chemotherapy, and radioimmunotherapy have been used to treat Burkitt's lymphoma, but systemic chemotherapy is mainstay of treatment. BL dramatically responds to chemotherapies that includes cyclophosphamide, vincristine, methotrexate, and prednisone causing regressions of tumor and often lead to long-term remission [18]. Our patient was also placed under complex chemotherapy resulting in the regression of the mass confirmed on post-therapeutic imaging.

The role of surgery in BL is still controversial. Surgical treatment is generally not required unless disease complications require prompt surgical intervention such as in cases of bowel obstruction, optic nerve decompression and airway obstruction [19]. Prognosis depends on the stage of the disease at presentation, age of patient, chemotherapy, lactate dehydrogenase levels and the association with HIV. Patients who receive an early treatment are associated with better outcomes in comparison to the delayed treatment

which can cause BL to reach other distant organs [20]. Patients with relapsed disease usually present symptomatically and within the first year after the completion of treatment. Relapsed disease may occur at the sites of original presentation or remotely [12].

6. Conclusion

BL has a very heterogeneous pattern of presentation and clinical course. The diagnosis can be suspected on CT and MRI, but the confirmation requires histopathology and immunohistochemistry. Burkitt lymphoma is high grade tumour however, with aggressive chemotherapy regimens, majority of the patient can be cured. Delays in diagnosis and treatment have a significant impact on prognosis. In addition, radiologists need to identify typical and uncommon sites and presentations in order to properly guide clinicians considering the urgency of possible therapy.

References

1. Magrath, I. (2009). Denis Burkitt and the African lymphoma. ecancermedicalscience, 3.
2. Al Burshaid, D. I., Nasser, M. A., Nagaraj, V., & Al Shehabi, M. H. (2019). Sporadic Burkitt's lymphoma of the hypopharynx: A case report. Saudi Journal of Medicine & Medical Sciences, 7(2), 114-117.
3. Lee, D. H., Yu, M. S., & Lee, B. J. (2013). Primary Burkitt's lymphoma in the nasal cavity and paranasal sinuses. Clinical and experimental otorhinolaryngology, 6(3), 184.
4. Delecluse, H. J., Feederle, R., O'Sullivan, B., & Taniere, P. (2007). Epstein–Barr virus-associated tumours: an update for the attention of the working pathologist. Journal of clinical pathology, 60(12), 1358-1364.
5. God, J. M., & Haque, A. (2010). Burkitt lymphoma: pathogenesis and immune evasion. Journal of oncology, 2010.
6. Baba, A. I., & Câtoi, C. (2007). Comparative oncology. bucharest: The publishing house of the romanian academy; chapter 11, mammary gland tumors.
7. Bispo, J. A. B., Pinheiro, P. S., & Kobetz, E. K. (2020). Epidemiology and etiology of leukemia and lymphoma. Cold Spring Harbor perspectives in medicine, 10(6), a034819.
8. Patankar S. Burkitt's lymphoma of maxillary gingiva: A case report. World J Clin Cases. 2015;3(12):1011. DOI | PubMed | Full Text |
9. Kallel, S., Ayedi, S., Ben Ayed, M., Salem, N., Achour, I., Ben Mahfoudh, K., ... & Charfeddine, I. (2023). Sinonasal Burkitt Lymphoma in a 2-Year-Old Child: An Uncommon Case Report. Ear, Nose & Throat Journal, 01455613231182659.
10. Orem, J., Mbidde, E. K., Lambert, B., De Sanjose, S., & Weiderpass, E. (2007). Burkitt\'s lymphoma in Africa, a review of the epidemiology and etiology. African health sciences, 7(3).
11. Storck, K., Brandstetter, M., Keller, U., & Knopf, A. (2019). Clinical presentation and characteristics of lymphoma in the head and neck region. Head & Face Medicine, 15, 1-8.
12. Kalisz, K., Alessandrino, F., Beck, R., Smith, D., Kikano, E., Ramaiya, N. H., & Tirumani, S. H. (2019). An update on Burkitt lymphoma: a review of pathogenesis and multimodality imaging assessment of disease presentation, treatment response, and recurrence. Insights into imaging, 10, 1-16.
13. Derinkuyu, B. E., Boyunağa, Ö., Öztunalı, Ç., Tekkeşin, F., Damar, Ç., Alımlı, A. G., & Okur, A. (2016). Imaging features of Burkitt lymphoma in pediatric patients. Diagnostic and Interventional Radiology, 22(1), 95.
14. Giraudo, C., Simeone, R., Fosio, M., Marino, D., & Cecchin, D. (2021). Diagnostic Value of PET/MR with DWI for Burkitt Lymphoma. Diagnostics, 11(10), 1867.
15. Kanungo, A., Medeiros, L. J., Abruzzo, L. V., & Lin, P. (2006). Lymphoid neoplasms associated with concurrent t (14; 18) and 8q24/c-MYC translocation generally have a poor prognosis. Modern pathology, 19(1), 25-33.
16. Graham BS, Lynch DT. (2024). Burkitt Lymphoma. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing.
17. Rowe, M., Fitzsimmons, L., & Bell, A. I. (2014). Epstein-Barr virus and Burkitt lymphoma. Chinese journal of cancer, 33(12), 609.
18. Magrath, I. (2012). Towards curative therapy in burkitt lymphoma: the role of early african studies in demonstrating the value of combination therapy and CNS prophylaxis. Advances in hematology, 2012.
19. Gahukamble, D. B., & Khamage, A. S. (1995). Limitations of surgery in intraabdominal Burkitt's lymphoma in children. Journal of pediatric surgery, 30(4), 519-522.
20. Cunha, K. C. C. M. S., Oliveira, M. C. L. A., Gomes, A. C. S., Castro, L. P. F. D., & Viana, M. B. (2012). Clinical course and prognostic factors of children with Burkitt's lymphoma in a developing country: the experience of a single centre in Brazil. Revista brasileira de hematologia e hemoterapia, 34, 361-366.