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A Case of Infraorbital B-cell Lymphoma Masquerading as an Abscess

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Abstract

Background/Aim: Primary ocular adnexal lymphomas pose a diagnostic challenge for physicians due to their nonspecific symptom presentation and resemblance to other periorbital masses, such as skin and soft tissue infections. Early diagnosis and appropriate management are crucial for optimizing outcomes and coordination of therapy.

Case Report: We present a case of a 67-year-old male with a history of infraorbital trauma, initially managed as a soft tissue infection, which was later revealed to be a large B-cell lymphoma. Despite multiple specialty evaluations, including dermatology, ophthalmology, plastic surgery, and ENT, among others, diagnosis was delayed, leading to worsening symptoms and vision impairment.

Conclusion: This case highlights the importance of considering ocular adnexal lymphomas in the differential diagnosis of periorbital masses and the need for interdisciplinary collaboration for timely recognition and treatment.

Keywords: Infraorbital, lymphoma, ocular, abscess.

Introduction

Although primary ocular adnexal lymphomas (OALs) account for only 1%-2% of all lymphomas, they represent one in ten periorbital masses. Despite their prominence among periorbital masses epidemiologically, the similarity in appearance of these tumors to skin and soft tissue infections and the anatomic location within the threshold of multiple specialties make identifying and treating these tumors a unique challenge to physicians. We present a case where an infraorbital large B-cell lymphoma was first identified as neoplastic in an outpatient infectious disease encounter and the challenges that led to its delayed recognition and treatment.

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Case Report

A 67-year-old male with a 47 pack-year tobacco use history presented to his primary care physician for evaluation of right infraorbital swelling. A month prior, the patient endured trauma to the right orbit after injuring his right eye against a lawn mower. A small, well-circumscribed, non-painful infraorbital lump grew larger in size and became more painful. The patient's primary care physician recommended conservative management with cold compresses, over-the-counter neomycin-bacitracin-polymyxin ointment, and peroxide. Despite these measures, the lesion's size progressed and developed a central induration and non-draining scab. The patient was referred to the Dermatology department, where a superficial culture of the region was obtained, revealing a scant growth of coagulase-negative Staphylococcus bacteria. The patient was prescribed doxycycline and mupirocin 2% topical ointment and referred to Ophthalmology due to the lesion's proximity to his eye. Figure 1 and Figure 2 demonstrate the patient's appearance before and after the orbital mass presentation.

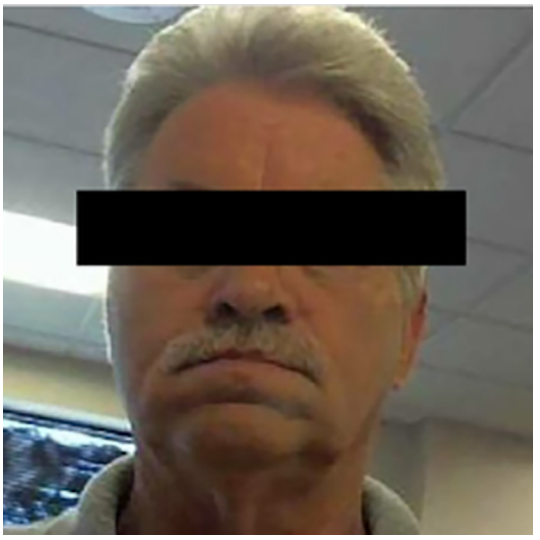

Figure 1. *Pre-tumor imaging of the patient. Photographs of the patient's face prior to the development of the infraorbital mass reveals normal facial anatomy. The patient displayed no visible swelling bilaterally. This image serves as a baseline for comparison with subsequent changes in appearance.*

Upon consultation, the ophthalmologist commented on the normal appearance, alignment, and extraocular movements of both eyes. A computed tomography (CT) scan of the head was ordered and demonstrated a 4.4×2.2×3.2 cm heterogeneously enhancing ovoid lesion involving the lower right eyelid and right infraorbital and maxillary facial soft tissues, without infiltration into the maxillary sinuses. Figure 3 demonstrates this lesion on CT imaging. Per the Radiologist, this could represent a complex fluid collection such as a phlegmon or an abscess. As a result, the patient was referred to Plastic Surgery for incision and drainage. The lesion's size increased and began to bleed, leading to vision difficulties. This was despite a month-long course of doxycycline treatment.

The patient arrived at his scheduled Plastic Surgery appointment, where he was referred to the Emergency Department. In the Emergency Department, he was discharged home and scheduled for outpatient incision and drainage (I&D) with Plastic Surgery the following morning. Plastic Surgery deferred to the Ear Nose Throat department. Ear Nose Throat deferred to Ophthalmology services, who also deferred performing the procedure due to the mass's sensitive location. Per surgical providers' recommendations, an oral surgeon evaluated the patient and performed the I&D, with no drainage from the site. Eventually, the patient saw an infectious disease specialist who, after being concerned for an underlying neoplastic process, recommended another biopsy. Pathology showed atypical lymphocytes, which stained positive for CD45, CD20, MUM-1, PAX5, with an elevated Ki67 at 75%. A diagnosis of clonal high-grade large B-cell lymphoma was made, and the patient was referred to Oncology for treatment planning.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. The case report and the entirety of the figures and images were reviewed and approved by the Institutional Board of Review (IRB). MHC IRB File #391.

Figure 2. *Post-excision biopsy appearance of the patient. Photographs of the patient's face after the excision of the right-sided infraorbital mass. Right-sided inflammation is visible even past the area of excision. Post-surgical changes are visible.*

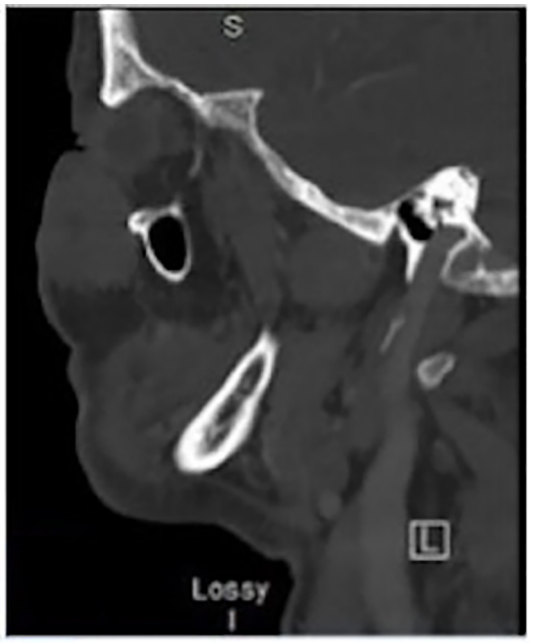

Figure 3. *Computed tomography (CT) imaging of the infraorbital mass. Contrast-enhanced CT was obtained to aid with diagnosis, revealing a 4.4×2.2×3.2 cm mass. The mass is displayed in sagittal cross-sectional view.*

Discussion

Primary OALs are malignant lymphoproliferative diseases that may involve the orbital soft tissue (including extraocular muscles), lacrimal gland, conjunctiva, eyelid, and lacrimal sac. Although they constitute only 1-2% of all lymphomas, they constitute 8% of extranodal lymphomas and around 11% of all orbital masses (1). The most frequent subtype is extranodal marginal zone lymphoma of mucosa-associated lymphoid tissue (MALT Lymphoma). According to the National Cancer Institute Surveillance, Epidemiology, and End Results (SEER), OAL incidence rates have increased from 1975 to 2001, at 6.2% and 6.5% per year among males and females, respectively (2).

OALs frequently present with nonspecific symptoms that can delay appropriate diagnosis. The median diagnosis age is 65 years old, with a slight female predominance (3). OALs may present as orbital masses, conjunctival hyperemia, exophthalmia, decreased visual acuity, and ptosis (4). Other associated ocular symptoms may include proptosis and dystopia (5). The interval between developing symptoms and diagnosis is variable, with a median of 6-7 months (6).

Orbital masses in the setting of adnexal lymphoma may often present as or be mistaken for orbital cellulitis. Orbital cellulitis is an infectious condition of the orbital

Table I. Selected cases of ocular adnexal lymphoma in the literature.

Case (reference)	Sex	Age	Initial diagnosis	Symptom presentation	Initial treatment
Bobba (8)	Female	15	Allergic conjunctivitis	One year of bilateral ocular erythema, discomfort	Topical corticosteroids
Shah (9)	Male	77	Orbital cellulitis	Left eye swelling (30 days), left eye pain (2 days)	IV antibiotics, IV corticosteroids
Khouchoua (10)	Male	65	Orbital cellulitis	Right orbital pain, blurred vision, and proptosis (15 days)	Diagnosis reached after imaging, treated for lymphoma
Chaurasiya (7)	Male	66	Orbital cellulitis	Painful proptosis, poor vision in left eye (15 days)	Corticosteroids (Prednisone), IV Antibiotics (Gentamicin, Ceftriaxone)
Rama (11)	Male	48	Preseptal/orbital cellulitis	Proptosis, Chemosis, Ptosis	Antibiotics (Bactrim), Corticosteroids (Prednisone)

soft tissue posterior to the orbital septum. Ocular lymphoma spreading to the ocular orbit can masquerade as orbital cellulitis, as direct tumor invasion can lead to orbital soft tissue inflammation (7).

Confirming a positive diagnosis of OAL is often long and difficult due to the small tumor size in most patients. Positive diagnosis must be based on histologic examination of a sufficient tumor sample obtained by surgical biopsy (4). Histopathologic examination consists of morphologic examination of cellular proliferation, usually combined with immunohistochemical analysis and molecular analysis. CT and magnetic resonance imaging may assist with diagnosis.

Table I demonstrates five select cases reviewed in the literature of OAL presenting as orbital masses, displaying patients of different ages, across both sexes, with different presenting symptoms, different initial diagnoses, and managed with therapies such as antibiotics and corticosteroids prior to biopsy. In four out of these five cases, lack of response to therapy with steroids and antibiotics prompted further investigation, eventually leading to diagnosis. These cases shed a light towards the difficulty of diagnosing OALs due to varying presentations.

Environmental exposure, autoimmune disorders (such as Sjogren's syndrome, systemic lupus erythematosus, and rheumatoid arthritis), and infectious agents (such as *Chlamydia psittaci*), have all been variously investigated as potential risk factors for OAL (12).

Pathogenesis for OAL is thought to involve autoantigen-related activation of B-cell receptors, driven by chromosomal translocations and gene mutations that regulate cell survival and apoptosis (3). Chronic antigenic stimulation due to autoimmune disorders may induce the accumulation of MALT, which provides an environment for the development of MALT-type lymphoma (13).

C. psittaci can induce chronic inflammation in the ocular orbit, which facilitates development of MALT in this region. In response, proliferation of B-cells in the marginal zone of lymphoid follicles can occur. These B-cells subsequently invade the germinal center of lymphoid follicles, causing chromosomal aberrations. These aberrations create an environment that supports clonal expansion of B-cells, even in the absence of antigenic stimulation (14).

Treatment for OALs usually involves radiation therapy; however, other modalities such as chemotherapy, immunotherapy, and surgical resection have all been

utilized. Many studies have been conducted over the past decade comparing conventional doses of radiation to lower doses and assessing treatment response. The International Lymphoma Radiation Oncology Group currently recommends dosing of 24-25 Gy (15). Despite radiation therapy, complications of OAL include frequent distant and contralateral relapses. This may be due to the presence of microscopic disease outside the initially targeted area of treatment (16). Novel agents and chemotherapy-free strategies are being investigated with the aim to reduce side effects and improve tumor control. With current treatment modalities, the 5-year survival rate is approximately 90%, while the disease-free survival rate is around 70% (1).

Several studies have reported treatment with chemotherapy alone or in combination with other modalities, but few have reported the response rates obtained with these treatments. Chemotherapy regimens have varied, including single-agent chemotherapy with chlorambucil or fludarabine, as well as combination regimens such as cyclophosphamide, doxorubicin, vincristine, and prednisone (CHOP). Immunotherapy is also emerging as a treatment, with agents such as IFN-α and rituximab showing promise. However, data on their efficacy are limited (4).

In cases of MALT lymphoma associated with *C. psittaci*, complete response can occur with antibiotic therapy alone (6). However, due to the small number of patients treated, anti-chlamydia antibiotic therapy (such as doxycycline) cannot yet be considered a standard treatment for OAL (4). Surgical resection remains the conventional treatment option for encapsulated tumors and is often necessary for diagnosing OAL. However, this approach carries a risk of recurrence (14).

Conclusion

Although the prognosis for primary OAL with treatment is excellent, reaching a diagnosis can be challenging. As in our case, diagnosis is often delayed, occurring only after unsuccessful courses of antibiotics for presumed bacterial infections and steroids for suspected cellulitis. Additionally, proper diagnosis and treatment can be complicated by the need for effective communication and collaboration across multiple specialties. In this case, ophthalmology, ENT, dermatology, and plastic surgery were some of the many providers evaluating the site of the tumor. Heightened awareness of primary OALs, their clinical presentation, and including them in the differential diagnosis for periorbital tumors are critical steps in improving coordination among specialties and ensuring timely and accurate diagnosis and treatment.

Conflicts of Interest

The Authors have no conflicts of interest to disclose in relation to this study.

Authors' Contributions

Saad Rashid and Mudassar Sandozi reviewed the literature and drafted the manuscript. Saagar Pamulapati, Ajay Doniparthi, and Suneha Pocha, were responsible for editing the manuscript. Saad Rashid was responsible for submission of this publication. All Authors have read and approved the final version of the manuscript.

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