

Treatment of Primary Scleral Maltoma: A Technical Challenge for Radiation Oncologist

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Abstract

We present a case of 53 years old male who developed reddish thickening on sclera and was diagnosed as scleral maltoma after investigations. Primary scleral involvement remains only a theoretical possibility and has never been documented in literature except for one odd case report where orbital lymphoma was misdiagnosed as scleritis but later proved to be of conjunctival origin by histology.¹ This case report has been brought up to highlight the technical challenges faced in planning and execution of external radiation therapy in primary scleral lymphoma.

Keywords: Ocular adnexal lymphoma, Scleral maltoma, Radiotherapy.

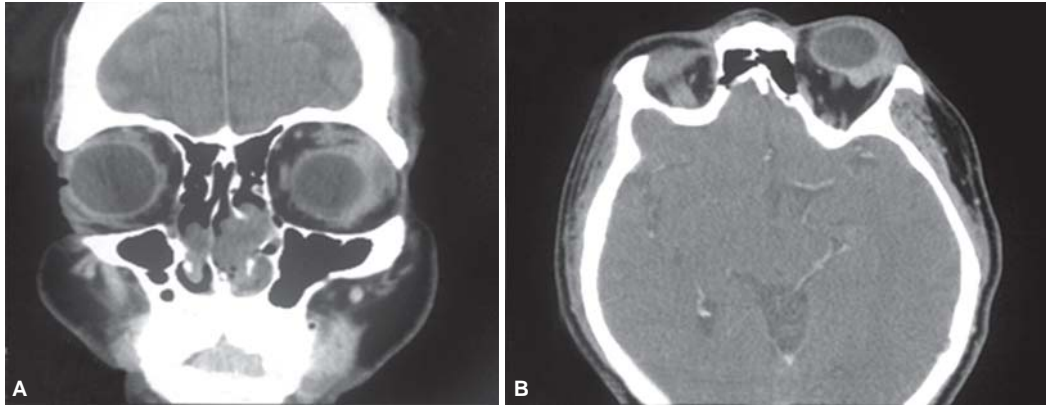
INTRODUCTION

Lymphomas of the ocular adnexa are a heterogeneous group of malignancies, accounting for approximately 1 to 2% of non-Hodgkin lymphomas (NHLs) and 8% of extranodal lymphomas.² More than 95% are of B-cell origin and 80% are low-grade lymphomas. Ocular adnexal lymphomas (OAL) are predominantly of mucosa associated lymphoid tissue (MALT) histology (57%), but also include other histological subtypes, such as follicular lymphomas (19%), diffuse large B-cell lymphomas (DLCL) and mantle cell lymphomas.^{3,4} Most frequent site of origin is the orbit (~ 40%), followed by conjunctiva (35-40%), lacrimal gland (10-15%), and eyelid (~ 10%).⁵ Herein we report a patient of low grade maltoma of sclera which is well-documented to be of scleral origin on radiology and confirmed on histopathology.

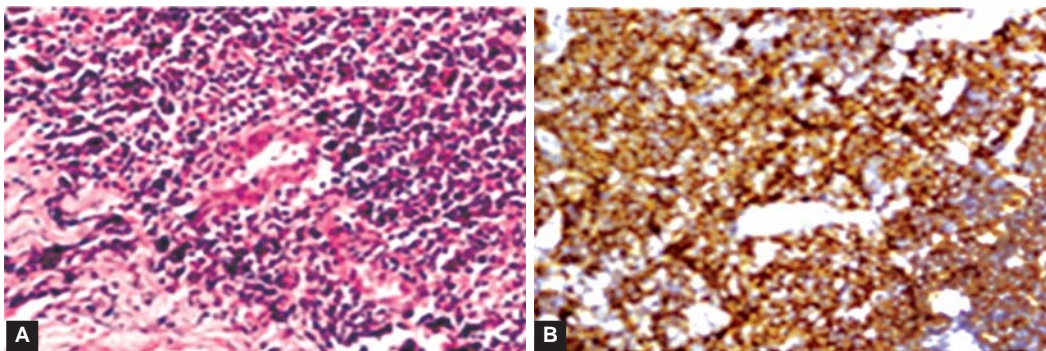
CASE REPORT

A 53 years old male presented in September 2009 with redness of left eye and discharge from left eye for 3 months and was not associated with pain, any other ophthalmic and systemic symptoms. Examination of peripheral lymph nodes did not reveal any abnormality and findings from systemic examination were normal. At local examination there was reddish thickening along left lateral side of sclera with mild chemosis and dilated episcleral vessels. There was no restriction of eye movements and visual acuity was normal. The right eye was normal.

The hematological and biochemical profile was within normal limits. Contrast enhanced computed tomography (CECT) of orbit, head and paranasal sinuses revealed homogenously enhancing scleral thickening involving predominantly lateral half of globe for thickness of about 2-3 mm on left eye with no evidence of any irregularity or intraocular component (Figs 1A and B). The paranasal sinuses and brain parenchyma was normal. No intracranial extension was seen. A biopsy was performed under local anesthesia from scleral thickening which revealed monomorphic sheets of atypical lymphoid cells which were 1.5-2 times size of mature lymphocytes with coarse chromatin, inconspicuous nucleoli and scanty amount of cytoplasm (Figs 2A and B). Immunohistochemistry showed that these cells were positive for CD20 and negative for CD3. Thus a diagnosis of low grade Maltoma was made. CECT of neck, thorax and abdomen did not reveal any abnormality. Bone marrow aspiration and biopsy was also performed and did not show any infiltration by lymphoma cells. After complete work up, patient was labeled as primary scleral lymphoma (low grade) stage I_{AE}. Patient was treated with radiotherapy alone. Radiation treatment was delivered with total dose of 36 Gy in 20 fractions administered by daily fraction of 1.8 Gy, 5 times a week. The patient was asked to look towards extreme right and was planned with 4 MeV electrons with a field size of 6 cm × 6 cm. The field was slightly angled. Shielding of normal lens and cornea was done by asking the patient to look towards extreme



Figs 1A and B: Contrast enhanced computed tomography of orbit and head of a patient showing scleral thickening of lateral half of globe



Figs 2A and B: (A) High power view showing atypical lymphoid cells and a lymphoepithelial lesion (H&E X40); (B) immunostaining with CD20 showing strong positivity for B cells (X40)

right and by using customized lens shield of 1 cm. Depth was calculated from CECT. Dose was prescribed at 3 mm and dose at 11 mm (region of lens) was 84%.

Patient tolerated radiotherapy well and no treatment interruption was required. Post-radiation patient had grade 1 periorbital erythema and grade 1 conjunctival congestion.

DISCUSSION

In this report we present a patient with primary scleral maltoma who achieved complete remission after local radiotherapy. The presenting age ranges from 15-70 years, but majority of orbital lymphomas occur around 60 years of age. Majority of the patients present with a palpable mass (64%) followed by eye irritation (28%), ptosis (20%), proptosis (18%), excessive tearing (16%), blurry vision (11%) and pain in the eye (3%) and our patient presented with redness and discharge of left eye. Majority of patients (85-90%) with OAL present with localized disease (stage I). Nodal involvement is reported in approximately 5% of patients. In various case series, 10 to 15% of patients have

disseminated disease (stage IV) at initial presentation, including bone marrow involvement in approximately 5%. The work up includes complete history, thorough systemic medical examination, complete blood counts, liver and kidney function tests, peripheral blood film, bone marrow biopsy, chest X-ray, CT of orbit, chest and abdomen. The patient described here had low grade MALT lymphoma stage IE, the most common histological subtype which accounts for more than half of the cases classified as extranodal marginal zone B-cell lymphoma according to the REAL classification.⁴

Various treatment modalities are available for the management of patients with OAL, including surgical resection, radiotherapy, single-agent or combination chemotherapy, and immunotherapy with monoclonal antibodies. However, no prospective clinical trials have been conducted to evaluate these therapeutic options or define the optimal treatment approach for these patients. For stage I and II localized disease process, radiation therapy is the primary modality of treatment. Reports in the literature^{6,7}

Table 1: Review of literature of orbital lymphoma treated with radiation therapy

Series	Number of patients	Stage	Histology	Dose(Gy)	Local control
Fung et al ⁴	98	I-IV	MALT, Follicular DLBCL	16.2-46	98%
Smitt et al ⁶	25	I-II	Low, intermediate and high	28-40.2	89%
Chao et al ⁷	20	I	Low and intermediate	20-43.2	100%

reveal local control rates of 89-100% and 5-year disease-free survival of 70-90% following local radiotherapy. The role of chemotherapy is uncertain. In a retrospective report, a local control rate of 100% was reported for patients treated with radiotherapy alone, but only 42% for patients treated with chemotherapy alone.⁸ No difference was observed in overall- or disease-free survival.

Treatment of this patient was challenging because of the radiosensitive lens, cornea and retina which were located near the target volume. For this superficial lesion confined to the lateral half of eye, electron beam therapy with a lead shield was used. The target volume included tumor plus 5 mm margin. Radiotherapy planning must be individualized, based on the extent of disease visualized on examination and imaging scans. Provided the planning target volume (PTV) is well covered and organs at risk well spared, what counts is individual treatment planning system (TPS) assisted—planning with individualized beam’s size, shape, angle and energy. The risk of cataract should be decreased with meticulous use of the customized lens shield. The electron energy used should be 4-9 MeV. Dose in the range of 25-30 Gy at 1.8-2 Gy per fraction can provide up to more than 95% local control.⁹ Fraction size is significant in the development of radiation retinopathy; therefore, whenever possible, daily fractions of 1.5-1.8 Gy are recommended. Reports in the literature reveal a local control rate of 83 to 100% following local radiotherapy (Table 1). Recently, in a review of the literature on radiation treatment of primary orbital lymphoma, Yadav et al report about acute and late toxicity of this type of therapeutic modality. The most frequent acute side effect is conjunctivitis that should be treated with artificial tears, while the most frequent late

toxicity is cataract that is today treated in a safe and efficient way by surgical technique.¹⁰

Our case has many common features with other cases of OAL described in the literature and very good response to radiotherapy. However, primary scleral maltoma of the orbit is rare and its treatment is a challenge.

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