Anterior-Segment Optical Coherence Tomography in the Diagnosis and Treatment of Diffuse Ocular Surface Squamous Neoplasia with Topical Mitomycin C: A Case Report

Tomografia de Coerência Ótica do Segmento Anterior no Diagnóstico e Tratamento de Neoplasia Difusa de Células Escamosas da Conjuntiva com Mitomicina C Tópica: Relato de Caso

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ABSTRACT

Ocular surface squamous neoplasia (OSSN) is the most common non-pigmented malignancy of the ocular surface. Interest in new, non-invasive diagnostic modalities and conservative management options has grown in recent years. We describe a challenging case of a 75-year-old man who presented with a large, diffuse, papilliform conjunctival lesion extending along the limbus from 6 to 3 clock hours in the right eye. Anterior-segment optical coherence tomography (AS-OCT) imaging revealed a thickened and hyperreflective epithelium, with an abrupt transition between normal and abnormal epithelium, suggestive of OSSN. Topical chemotherapy with mitomycin-C (MMC) was proposed as primary treatment given the risks associated with surgical excision. A total of four cycles were completed until clinical regression of the lesion was achieved, which was confirmed by AS-OCT. Topical MMC therapy showed to be a safe and efficient treatment option in diffuse OSSN, with AS-OCT having an important role in diagnosis, treatment guidance, and long-term monitoring of the patient.

KEYWORDS: Carcinoma, Squamous Cell/diagnosis; Carcinoma, Squamous Cell/drug therapy; Eye Neoplasms/diagnosis; Eye Neoplasms/drug therapy; Mitomycin/therapeutic use; Tomography, Optical Coherence.

RESUMO

A neoplasia de células escamosas da superfície ocular (OSSN) é o tumor maligno não-pigmentado mais comum da superfície ocular. Recentemente, tem-se verificado um interesse crescente por modalidades de diagnóstico não-invasivas e opções terapêuticas conservadoras. Descrevemos o caso clínico de um homem de 75 anos que apresentava uma lesão conjuntival

difusa no olho direito, de aspeto rosado e papiliforme. Foram adquiridas imagens de tomografia de coerência ótica de segmento anterior (AS-OCT), que revelaram um epitélio conjuntival espessado e hiperrefletivo no local da lesão, achados sugestivos de OSSN. Devido aos riscos associados à excisão cirúrgica, foi iniciada quimioterapia tópica com mitomicina-C (MMC) como tratamento primário da lesão. Realizaram-se quatro ciclos de quimioterapia tópica, constatando-se regressão clínica completa, confirmada por AS-OCT. A quimioterapia tópica com MMC mostrou ser uma opção terapêutica segura e eficaz, com a AS-OCT a desempenhar um papel importante no diagnóstico, tratamento e vigilância a longo prazo do doente.

PALAVRAS-CHAVE: Carcinoma de Células Escamosas/diagnóstico; Carcinoma de Células Escamosas/tratamento farmacológico; Neoplasias Oculares/diagnóstico; Neoplasias Oculares/tratamento farmacológico; Mitomicina/uso terapêutico; Tomografia de Coerência óptica.

INTRODUCTION

Ocular surface squamous neoplasia (OSSN) is the most common non-pigmented malignancy of the conjunctiva and cornea.[1] It encompasses a spectrum of conjunctival and corneal squamous epithelial tumours which include dysplasia, intraepithelial neoplasia, and squamous cell carcinoma.[2–4] The diagnosis of OSSN is usually suspected clinically with the identification of an elevated lesion in the interpalpebral conjunctiva with a characteristic gelatinous, papilliform, or leukoplakic appearance.

Confirmation of diagnosis is made by histopathologic evaluation after biopsy of the lesion. However, there has been a growing interest in non-invasive diagnostic modalities, such as anterior-segment optical coherence tomography (AS-OCT).[4,5] AS-OCT imaging provides an optical biopsy of conjunctival and corneal tissue, helping in the diagnosis and follow-up of OSSN lesions.

Conservative management options have also emerged in the treatment of OSSN, including topical medical agents such as mitomycin-C (MMC). These are valuable alternatives to surgical excision, which is generally considered the primary treatment option for OSSN.

The purpose of this work was to describe a case of diffuse OSSN successfully treated with topical MMC at our centre, and to demonstrate the importance of AS-OCT in the diagnosis and management of these lesions.

CASE REPORT

A 75-year-old man presented for ophthalmic evaluation with complains of foreign body sensation and ocular redness in his right eye (RE) with several months' duration. He had no relevant past medical history. At ophthalmological examination, visual acuity was 20/63 in the RE and 20/25 in the left eye. RE slit lamp biomicroscopy revealed a diffuse, exophytic, papilliform conjunctival lesion with a pearly rose appearance involving the temporal, superior, and nasal bulbar conjunctiva and extending along the corneo-scleral limbus from 6 to 3 clock hours (Fig. 1). No other relevant findings were noted on ophthalmic evaluation.

Figure 1. Right eye anterior segment photographs showing a diffuse, papilliform-appearing conjunctival lesion involving the temporal, superior, and nasal bulbar conjunctiva and extending along the corneo-scleral limbus from 6 to 3 clock hours. A conjunctival haemorrhage can also be noted in the nasal and inferior conjunctiva.

AS-OCT images were acquired at the level of the lesion, revealing a thickened and hyperreflective epithelium with an abrupt transition between normal and abnormal epithelium, suggestive of OSSN (Fig. 2). Based on characteristic clinical and imaging findings, a presumptive diagnosis of OSSN was established. An ultrasound evaluation of the

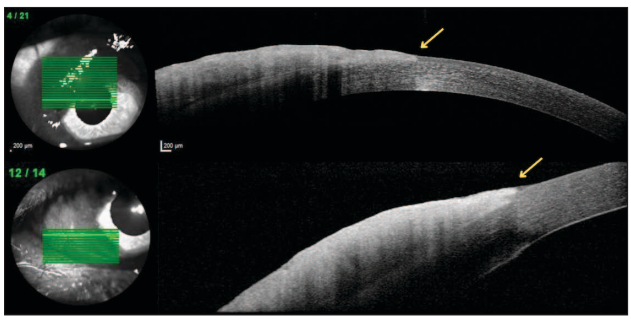

Figure 2. Right eye anterior segment optical coherence tomography scans demonstrate a thickened and hyperreflective epithelium at the level of the lesion, with an abrupt transition (arrows) between normal and abnormal epithelium.

pre-auricular and neck lymph nodes was performed, with no relevant alterations being detected.

Treatment options were discussed with the patient, and the use of topical chemotherapy with MMC was proposed given the lesion' size and risks associated with surgical excision. The treatment regimen consisted of topical MMC 0.03% drops delivered four times daily for one week, followed by a "holiday" week with no topical MMC instillation, repeated until clinical regression of the lesion was achieved. A preservative-free ocular lubricant was applied four times daily and topical dexamethasone 0.01% was administered twice daily during the "holiday" week to minimize ocular surface irritation. Temporary punctal plugs were placed in the RE to prevent punctal stenosis and minimize systemic absorption of MMC.

A total of four cycles were completed, with the lesion showing gradual reduction in size until it became clinically regressed (Fig. 3), which was confirmed by AS-OCT (Fig. 4). The topical therapy was relatively well tolerated by the patient, who reported mild discomfort. Mild to moderate conjunctival hyperemia was noted, but resolved after topical MMC was stopped. No other signs of toxicity were present during the treatment period. The patient maintained regular follow-up visits, which included complete ophthalmic examination and AS-OCT imaging, with no signs of recurrence of the disease or adverse effects related to treatment at 12-month follow-up.

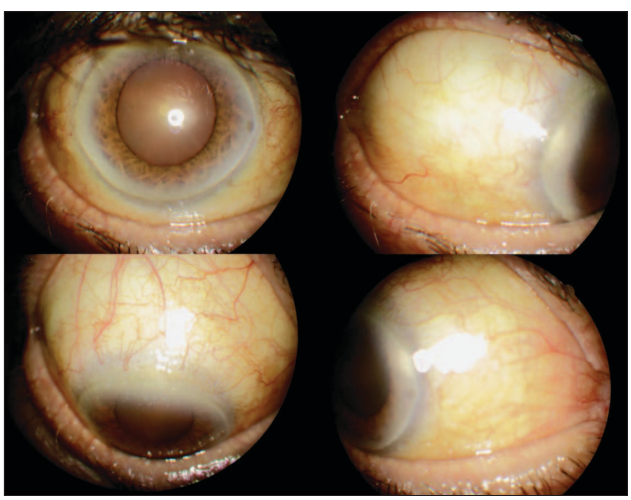

Figure 3. Complete regression of the presumed ocular surface squamous neoplasia can be noted on right eye anterior segment photographs obtained after four cycles of topical therapy with mitomycin C.

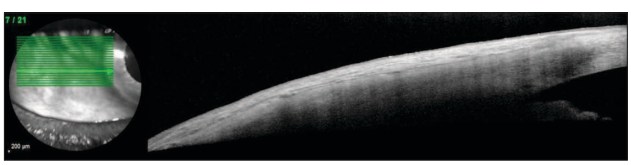

Figure 4. Right eye anterior segment optical coherence tomography scans in the area where the lesion was located show normal epithelial thickness and appearance after the patient completed four cycles of topical therapy with mitomycin C.

DISCUSSION

In this case report, we describe a complex case of diffuse OSSN managed safely and efficiently with topical MMC therapy guided by AS-OCT. This approach resulted in manageable ocular toxicity and prevented the development of sequelae typically associated with surgical excision.

AS-OCT is a recent diagnostic tool that provides fast, non-invasive, high-resolution images of the ocular surface. Histopathological evaluation is considered the gold standard for the diagnosis of OSSN, but AS-OCT has emerged as a useful tool for diagnosis of ocular surface lesions, follow-up during medical treatment, and monitoring of disease recurrence.[6–10]

OSSN in AS-OCT has a classic appearance of a thickened and hyperreflective epithelium, with an abrupt transition between normal and abnormal epithelium.[3,11] These findings have a reported high sensitivity and specificity in distinguishing OSSN from other ocular surface lesions.[7,12,13] In our case, the clinical and AS-OCT imaging features of the conjunctival tumor made the diagnosis of OSSN very likely. Nevertheless, because a biopsy was not performed, no histopathological grading of the lesion and assessment of deep invasion was obtained.

In parallel with the rising interest in less-invasive diagnostic modalities, there has also been a move to more conservative therapeutical approaches for OSSN. Surgical excision has been considered the gold standard treatment for OSSN.[14–16] It is both a diagnostic and therapeutic procedure, providing rapid tumour resolution and definitive histopathological diagnosis.[14] Possible disadvantages include surgical sequelae such as conjunctival scarring, symblepharon, and limbal stem cell deficiency, and risk of tumour recurrence, with reported recurrence rates of up to 56%.[17]

Surgical excision of OSSN remains the standard treatment for tumours occupying ≤4 clock hours of the limbus or with a basal diameter ≤5 mm, while primary topical chemotherapy is currently preferred for larger or multifocal lesions, avoiding the risks associated with surgical excision and treating the entire ocular surface, including subclinical disease.[14,18–20] MMC, a non-cell-cycle dependant alkylating agent, has been reported to cause tumour resolution in 76%–100% of cases when used as primary therapy, including in advanced tumours, with a recurrence rate of 0%–35%.[5,21–24] The most common side effects include limbal stem cell deficiency, conjunctival injection, lid toxicity, punctal stenosis, recurrent corneal erosion, and punctate keratopathy.[5,22–24]

Giving the size and extension of the OSSN lesion in our patient, a decision was made to initiate topical chemotherapy with MMC, with the aim of achieving complete regression of the tumor and preventing recurrences, while ensuring a good functional and cosmetical result. Despite the side-effects profile of MMC, topical therapy was relatively well tolerated by the patient. AS-OCT scans were obtained regularly during follow-up to confirm good response to treatment and monitor possible recurrence.

In conclusion, prompt diagnosis and effective treatment

of OSSN can be achieved when combining new diagnostic modalities and primary topical chemotherapy, especially in diffuse disease, thus minimizing morbidity associated with surgical treatment.

CONTRIBUTORSHIP STATEMENT / DECLARAÇÃO DE CONTRIBUIÇÃO

CF: Conception and design of the work, data acquisition and analysis, draft of the paper, critical review, and approval of the final version.

PM: Conception and design of the work, data acquisition and analysis, critical review, and approval of the final version.

RR: Patient care, conception and design of the work, critical review, and approval of the final version.

CF: Conceção e desenho do trabalho, aquisição e análise dos dados, redação do artigo, revisão crítica e aprovação da versão final.

PM: Conceção e desenho do trabalho, aquisição e análise dos dados, revisão crítica e aprovação da versão final.

RR: Assistência aos pacientes, conceção e desenho do trabalho, revisão crítica e aprovação da versão final.

RESPONSABILIDADES ÉTICAS

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