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Triad for Ocular Surface Bowen Disease: Surgical Excision Adjuvant Topical Mitomycin C and Amniotic Membrane Transplantation in One-Year Outcomes A Case Report

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ABSTRACT

A 52-year-old man with remote HBV positivity presented with a recurrent, circumferential right-eye conjunctival lesion and underwent wide excision with intraoperative 0.02% mitomycin C (MMC)–soaked sponges, amniotic membrane grafting, and subsequent topical MMC 0.02% in alternating-week cycles; histopathology showed squamous cell carcinoma in situ (Bowen's disease), an entity within the ocular surface squamous neoplasia spectrum managed effectively with surgery and topical chemotherapy to reduce recurrence risk. Early postoperative recovery was favorable, with re-epithelialization under a bandage contact lens, complete amniotic membrane resorption, and later conjunctival autografting to cover temporal bare sclera. No tumor recurrence was observed during short-term follow-up; longer surveillance was curtailed due to death from systemic causes unrelated to the ocular disease. This case aligns with literature supporting adjuvant topical MMC (commonly 0.02–0.04% in cyclic regimens) for conjunctival–corneal intraepithelial neoplasia to achieve high resolution rates while balancing risks such as delayed corneal epithelial erosions and limbal stem cell deficiency.

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Introduction

Bowen's disease denotes squamous cell carcinoma in situ confined above the epithelial basement membrane and, in the conjunctival–corneal setting, falls within Ocular Surface Squamous Neoplasia (OSSN) encompassing intraepithelial lesions through invasive squamous cell carcinoma [1]. Standard management includes complete excision with cryoadjuvant when feasible and topical chemotherapeutics such as MMC, 5-fluorouracil, or interferon alpha-2b to treat subclinical disease and reduce recurrence, with additional modalities (e.g., radiotherapy and photodynamic therapy) reserved for selected scenarios [2].

MMC is a non–cell-cycle–specific alkylating agent applied topically in cycles (e.g., 0.02– 0.04% QID for 1–3 weeks on/off) or intraoperatively on sponges, achieving high resolution in CCIN with low to moderate toxicity when dosing and exposure are limited [3]. Reported short- and long-term adverse effects include transient keratoconjunctivitis, allergy, punctal stenosis, and, less commonly at 0.02%, delayed corneal epithelial erosions and limbal stem cell deficiency, underscoring the importance of regimen individualization and ocular surface protection during therapy [4].

Materials and Methods

This single-patient case report was managed at a tertiary ophthalmic center (Ospedale Cannizzaro, Catania) between 2024 and 2025 following established surgical and topical MMC protocols for CCIN/Bowen's disease and contemporary techniques for Amniotic Membrane Transplantation (AMT) in ocular surface reconstruction. Per standardized practice, wide conjunctival excision was combined with intraoperative MMC 0.02% sponges, AMT, bandage contact lens protection, and postoperative cyclic topical MMC 0.02% (QID) with supportive antibiotic–steroid drops, with subsequent surface rehabilitation by conjunctival autograft for residual bare sclera as indicated by healing dynamics [5].

Clinical assessments included slit-lamp biomicroscopy, documentation of lesion extent in clock hours, and histopathologic confirmation of squamous cell carcinoma in situ, with scheduled follow-up to detect early complications and recurrence consistent with published follow-up schemes for MMC-treated OSSN.

Results

At presentation, the right-eye circumferential gelatinous conjunctival lesion extended approximately 270° (from 4 to 1 o'clock), compatible with diffuse CCIN patterns described in series where adjuvant topical MMC is favored to treat subclinical margins and limbal field change [2]. The patient underwent wide excision with intraoperative MMC 0.02%–soaked sponge application followed by AMT and a bandage contact lens, reflecting evidence

that MMC can be used intraoperatively and that AMT supports rapid epithelialization with reduced inflammation and scarring [3].

Histopathology demonstrated squamous cell carcinoma in situ (Bowen's disease), aligning with historical and contemporary definitions of intraepithelial epithelioma without basement membrane invasion in ocular sites [1]. Postoperatively, an antibiotic– corticosteroid combination was administered for 8 weeks, and topical MMC 0.02% QID was given in alternating-week cycles, a regimen consistent with effective cyclic dosing schedules used to balance tumor control and surface toxicity in OSSN [4].

By approximately three weeks, conjunctival sutures were removed and the bandage lens reapplied, and the amniotic membrane had completely resorbed within the subsequent three weeks, consistent with reports that AM dissolves while facilitating re-epithelialization and stromal stability [5]. Due to a temporal bare sclera after AM dissolution, a conjunctival autograft from the fellow eye was transplanted, a standard approach for definitive surface coverage when residual defects persist after initial reconstruction [6].

The patient recovered well and was discharged with planned surveillance; however, subsequent follow-up was curtailed by death from systemic causes unrelated to Bowen's disease, precluding long-term recurrence assessment, though literature indicates low recurrence with appropriately dosed topical MMC in CCIN [2].

Discussion

This case illustrates comprehensive management of extensive conjunctival Bowen's disease using multimodal therapy: wide excision for debulking, intraoperative and adjuvant MMC for field control, and staged surface reconstruction with AMT followed by conjunctival autograft, mirroring strategies that achieve high lesion resolution while minimizing structural morbidity in CCIN (2). MMC 0.02% used intraoperatively on sponges and postoperatively in cyclic QID regimens is supported by multicenter and long-term series demonstrating complete regression in most cases after 1–2 cycles with low recurrence, particularly at the lower concentration and with careful punctal practices to limit nasolacrimal exposure [4].

Regimen selection requires balancing efficacy and toxicity; while 0.04% for longer cycles increases short-term intolerance and risks of limbal stem cell deficiency and punctal stenosis, 0.02% with limited duration and intervals between cycles reduces adverse events, though delayed corneal epithelial erosions can still occur months later and warrant surveillance [3, 4]. In this context, ocular surface protection with a bandage contact lens and aggressive lubrication, plus timely suture removal, aligns with supportive measures described to reduce symptomatic keratoconjunctivitis during MMC cycles [4].

AMT was selected to promote rapid epithelialization, modulate inflammation and fibrosis, and temporarily scaffold the surface—an approach corroborated by histopathologic evidence that AM often dissolves without long-term remnants while conferring biological benefits that stabilize the ocular surface [5]. When residual bare sclera persists after AM dissolution, conjunctival autografting provides durable coverage and restores surface integrity, and AMT has been specifically reported as an adjunct in conjunctival Bowen disease excisional surgery to reconstruct the ocular surface effectively [6].

Alternative adjuvant or primary therapies inform individualized decision-making for OSSN/Bowen's disease: interferon alpha-2b and 5-fluorouracil have demonstrated efficacy, and orthovoltage or strontium-90 radiotherapy offers globe-sparing options in extensive cases where surgery and topical agents pose challenges, whereas dermatologic Bowen's disease data support photodynamic therapy and imiquimod for field-directed therapy or large lesions in anatomically delicate sites [7-11]. Mohs micrographic surgery is an effective tissue-sparing option for periocular Bowen's

disease of the eyelid and conjunctival margin in selected cases, with low recurrence when complete margin control is achieved [12].

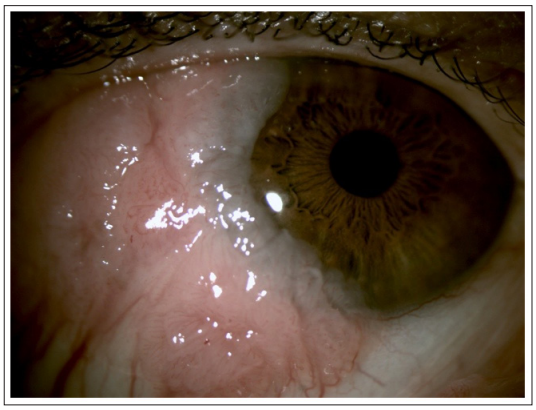

Figure 1: Circumferential Gelatinous Conjunctival Lesion of the Right Eye Spanning Approximately 270° from 4 to 1 O'clock with Corneal Invasion

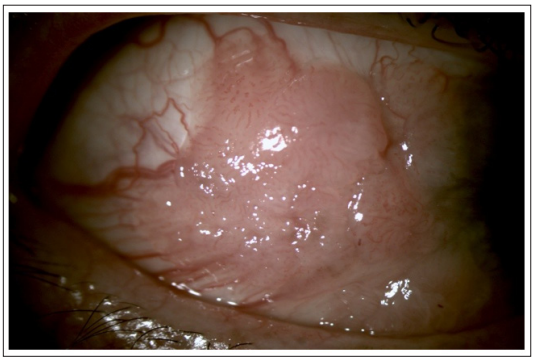

Figure 2: Circumferential Gelatinous Conjunctival Lesion of the Right Eye Spanning Approximately 270° from 4 to 1 o'Clock

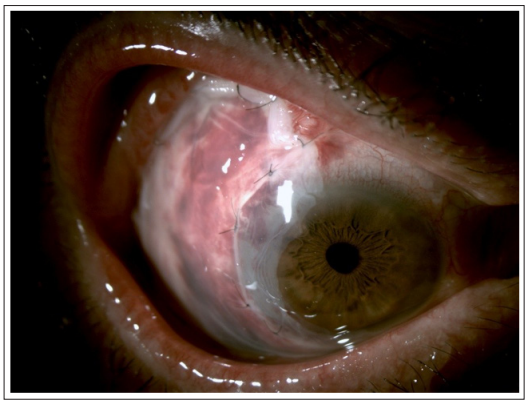

Figure 3: Conjunctivoplasty with Amniotic Membrane Transplantation

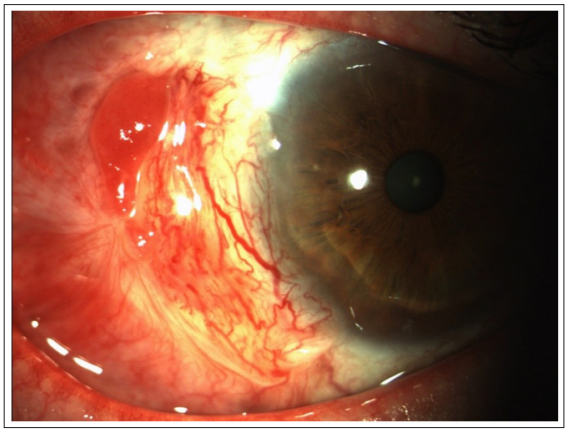

Figure 4: Three Weeks Later After Complete Resorption of the Amniotic Membrane a Conjunctival Autograft Was Performed to Reconstruct the Temporal Area of Bare Sclera

A key limitation is the abbreviated follow-up due to intercurrent death, preventing assessment of late recurrence or delayed MMC toxicities that can emerge months after therapy; long-term studies emphasize surveillance beyond one to two years, given rare late epithelial erosions and occasional recurrences [4]. Overall, the clinical course and early outcomes in this case align with the literature supporting combined surgical excision, adjuvant topical MMC 0.02% in cycles, and AMT with subsequent autografting to achieve tumor control and surface rehabilitation in extensive conjunctival Bowen's disease [3].

Conflicts of Interest

We declare that we have no economic interests or conflicts of interests.

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