

# Photorefractive keratectomy with mitomycin-C for the treatment of compound moderate myopia with astigmatism in buccal pemphigus vulgaris

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We report a case of controlled buccal pemphigus vulgaris with compound moderate myopia with astigmatism that was treated with photorefractive keratectomy with mitomycin-C (PRK + MMC) in both eyes. The preoperative manifest refraction was  $-6.50$  sphere and  $-5.5 -0.75 \times 20$  in the right eye and left eye, respectively, with a best corrected visual acuity of 10/10 in both eyes. Seven months after surgery, the uncorrected visual acuity was 10/10 in both eyes. The manifest refraction was 0.75 sphere and  $0.50 -0.75 \times 120$  in the right eye and left eye, respectively. Haze was not detected in the follow-up examinations. Reepithelialization was complete 5 days after surgery in both eyes. The results show that PRK + MMC for compound moderate myopia with astigmatism in a patient with controlled pemphigus vulgaris may be an effective and safe treatment.

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Many patients with an autoimmune disease may also have refractive errors. Autoimmune diseases are contraindications to keratorefractive surgery, including photorefractive keratectomy with mitomycin-C (PRK + MMC).<sup>1–6</sup> The proposed reasons are a risk for a higher postoperative inflammatory response, a potentially damaging effect on the postoperative healing properties of the cornea, and the theoretical possibility that surgery could trigger a latent predisposition to corneal melting and significant scarring. However, the relationship between corneal disease and autoimmune disease depends on the type of autoimmune disease. Some are strongly associated with corneal disease, some are weakly associated, and some have no known association.<sup>3</sup> Immunosuppressive and

immunodeficient conditions are also contraindications to keratorefractive surgery procedures.<sup>1</sup>

The autoimmune disease pemphigus vulgaris is characterized by intraepithelial bulla formation.<sup>7</sup> In this disease, autoantibodies are directed against an antigen present in the intercellular space of the squamous epithelium, both epidermal and mucosal (Figure 1).<sup>8,9</sup> In nearly all cases, IgG and complement components can be demonstrated in the intercellular space of early acantholytic lesions.<sup>10,11</sup> The most common type of pemphigus encountered in the United States is pemphigus vulgaris.<sup>12</sup> Ocular lesions occur in approximately 16% of patients.<sup>13</sup> Intraepithelial conjunctival bullae are seen mainly on the palpebral conjunctiva, commonly near the inner canthus.<sup>12</sup> The bullae rupture and usually heal without scarring.<sup>12</sup>

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## CASE REPORT

A 28-year-old woman came to Noor Vision Correction Center for refractive surgery. She had a history of blistering buccal mucosal lesions and had seen a dermatologist. The pathology report of the buccal mucosal lesion biopsy showed a cleavage between squamous cells and basal cells and inflammatory cell infiltration in the connective tissue. The pathologic diagnosis was pemphigus vulgaris (Figure 1), and the patient was treated with pulse oral prednisolone 100 mg/d and immunane 100 mg/d. Immunane was tapered and discontinued after 10 months. At the time of the ophthalmic visit, the patient was taking a 5 mg/d maintenance dose of prednisolone. She had buccal mucosal

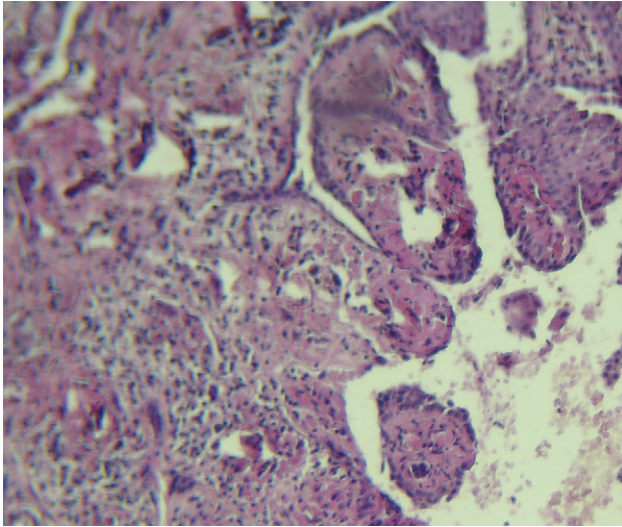


Figure 1. Buccal mucosal pathology.

membrane lesions only, no ophthalmic or cutaneous symptoms. There was no other significant issue in the medical history.

At the ophthalmic examinations, the uncorrected visual acuity (UCVA) was counting fingers at 1.5 m in both eyes. The best corrected visual acuity (BCVA) was 10/10 with  $-7.00 -0.75 \times 180$  in the right eye and  $-6.00 -1.50 \times 20$  in the left eye. The manifest refraction was  $-6.50$  sphere and  $-5.50 -0.75 \times 20$ , respectively. The subjective refraction was  $-7.00$  sphere and  $-5.50 -1.00 \times 20$ , respectively, with a BCVA of 10/10 in both eyes. The cycloplegic refraction was  $-6.50$  sphere in the right eye and  $-5.50 -1.00 \times 20$  in the left eye. The refraction had been stable for the past 2 years, and the patient had been wearing the same spectacles.

Since the patient was on corticosteroid treatment, it was important to rule out refractive instability caused by high blood sugar or cataracts. The intraocular pressure (IOP) was 15 mm Hg in both eyes, and the Marcus Gunn sign was negative. All findings on slitlamp examination were normal in both eyes. The keratometry with the Javal keratometer was 44.25 @ 180/45.50 @ 90 in the right eye and 44.25 @ 10/46.25 @ 105 in the left eye. On the funduscopy examination, the cup/disc (C/D) ratio was 2/10 in both eyes, with normal maculae, vessels, and peripheral retinae. The topography pattern (EyeSys) was normal (Figure 2). The pachymetry was 514  $\mu$ m and 508  $\mu$ m in the right cornea and left cornea, respectively.

Before surgery, the risks of the operation relative to pemphigus vulgaris and corticosteroid consumption were thoroughly discussed. The patient was informed that the risk for

infection could be greater than in normal cases and that since there were no reports of PRK + MMC in pemphigus vulgaris patients, there was no information about the healing process and scar formation on the cornea. The patient insisted on having the operation despite the risks and signed a legal informed consent. Therefore, after dermatologic consultation and documentation of the pemphigus vulgaris being under control, standard PRK + MMC was performed. The dermatologic consultant suggested increasing the dose of oral prednisolone from 5 mg/d to 30 mg/d 3 days before surgery, continuing this dose for 3 days after surgery, and then tapering it to 5 mg/d over a 3-week period.

Surgery was performed under topical anesthesia. The center of the cornea was marked using a microtrephine with an 8.0 mm diameter and a 70  $\mu$ m deep calibrated blade (Janach J 2900S). The epithelium was removed mechanically with a hockey knife, and the ablation was performed using a Technolas 217C excimer laser (Bausch & Lomb). The overall ablation diameter was 8.40 to 8.90 mm and consisted of a central optical zone of 5.80 mm with a 2.90 mm transition zone. The attempted refraction was  $-7.00$  diopters (D) in the right eye and  $-5.50 -1.00 \times 20$  in the left eye. Because of mitomycin application, the eyes were intentionally undercorrected by 5% compared with the LASIK nomogram.<sup>14</sup>

Immediately after laser ablation, a single topical application of MMC 0.02% (0.2 mg/mL) diluted in balanced salt solution was instilled in each eye with a Weck sponge placed over the ablated stroma for 2 minutes. The corneal surface and the entire conjunctiva were then vigorously irrigated with 20 mL cold normal saline to remove the residual MMC. At the end of the procedure, a bandage contact lens (Hydrone-Actifresh 400) was applied; this was removed after complete reepithelialization on the fifth postoperative day.

Immediately after surgery, an oral analgesic (acetaminophen codeine) was given. The postoperative regimen included artificial tears (Sno Tears) and betamethasone eyedrops 0.1% every 4 hours for 2 weeks. In addition, ciprofloxacin 0.3% drops were administered every 4 hours and diclofenac sodium 0.1% eyedrops every 6 hours until reepithelialization was complete. The contact lenses were then removed, and the betamethasone eyedrops were replaced by fluorometholone every 4 hours until the end of the second postoperative week. During the following 2 weeks, fluorometholone and Sno Tears eyedrops were administered every 6 hours. During the second and third months, fluorometholone and Sno Tears were administered every 8 and 12 hours, respectively; they were then discontinued. The patient was instructed to wear sunglasses in direct sunlight for 6 months.

At 1 month, the manifest refraction was  $2.50 -1.50 \times 170$  in the right eye and  $1.00 -0.25 \times 20$  in the left eye. The UCVA was 8/10 and 10/10, respectively, and the BCVA was 9/10 in the right eye. At 3 months, the manifest refraction was  $1.50 -0.75 \times 180$  in the right eye and  $1.00 -0.50 \times 65$  in the left eye, with a BCVA of 10/10 in both eyes. The UCVA was 9/10 and 10/10, respectively. At the end of 7 months, the manifest refraction was 0.75 and 0.50  $-0.75 \times 120$ , respectively. The UCVA was 10/10 in both eyes.

There was no delayed reepithelialization, persistent epithelial defect, microbial keratitis, corneal edema, melting and perforation, or any grade of haziness observable up to 7 months postoperatively (Figures 3 and 4).

## DISCUSSION

To our knowledge, there are no reports of PRK + MMC in patients with pemphigus vulgaris. The immunologic

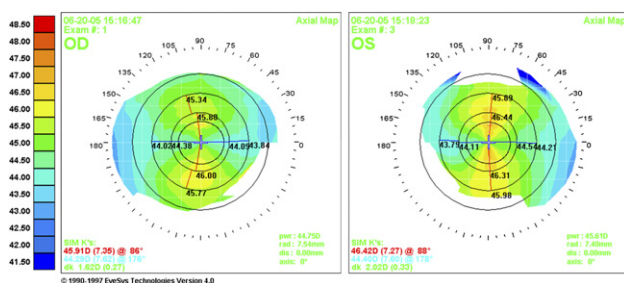
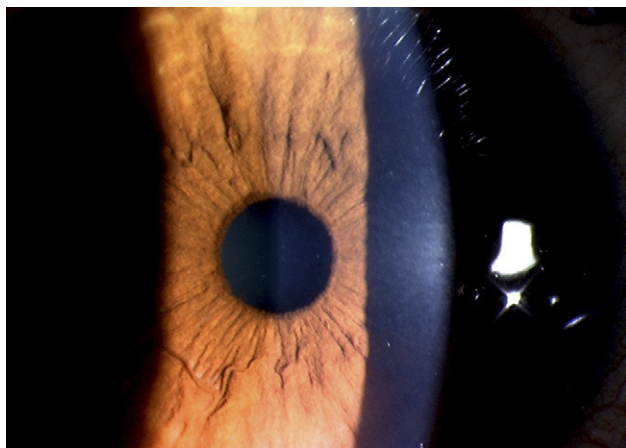


Figure 2. Preoperative topography.



**Figure 3.** Right eye, 7 months after surgery.



**Figure 4.** Left eye, 7 months after surgery.

issues may be the greatest concern in performing keratorefractive surgery, including PRK+MMC, in these patients, especially the occurrence of corneal haze. Because the cornea is not involved in this disease, the epithelial bulla healed without a scar, and the disease was under control, we anticipated a successful PRK+MMC procedure in this patient.

The importance of the autoimmune disease being inactive or well controlled has been proposed by Smith and Maloney<sup>3</sup> relative to the safety of laser in situ keratomileusis in patients with autoimmune disease. Another important risk of performing keratorefractive surgery in patients who are receiving immunosuppressive treatment with systemic corticosteroids is increased postoperative infections. For this reason, we used the broad-spectrum ciprofloxacin eyedrops until complete reepithelialization occurred (by the fifth day); this result is comparable to that in a previous study.<sup>14</sup> Another concern was possible complications ensuing from MMC, such as endothelial toxicity,<sup>15</sup> although no case of direct toxicity associated with the intraoperative use of MMC 0.02% for 2 minutes has been reported.<sup>16</sup>

After surgery, the UCVA and the BCVA improved gradually and at the end of the third month, despite 1.00 to 1.50 D of hyperopia, the UCVA was 10/10 because the patient was young and had good accommodative compliance. At the end of 7 months, the hyperopia decreased to 0.50 to 0.75 D. The absence of corneal haziness at all the follow-up visits suggests that MMC was an effective preventive measure in this patient. Considering there were no complications, we suggest that PRK+MMC may be a way to correct the refractive errors in patients with controlled pemphigus vulgaris. However, more studies with more cases are needed to support this observation, in

addition to investigations of the risks and complications associated with different MMC concentrations and exposure times in these patients.

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