Conventional Epi-LASIK and Lamellar Epithelial Debridement in Myopic Patients with Dermatologic Keloids

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We report the outcome of conventional epipolis laser in situ keratomileusis (Epi-LASIK, flap-on) and lamellar epithelial debridement (LED; Epi-LASIK, flap-off) in myopic patients with dermatologic keloids. Three patients, who were all noted to be susceptible to keloid scarring, received conventional Epi-LASIK in their right eyes and LED in their left eyes. The patients were followed-up for 6 to 21 months after their surgeries, and the outcomes were then evaluated. In case 1, the preoperative spherical equivalent (SE) was -6.5 diopters (D) in the right eye (OD) and -6.25 D in the left eye (OS). At 21 months postoperatively, the uncorrected visual acuity (UCVA) was 20 / 12.5 in both eyes. In case 2, the preoperative SE was -5.25 (OD) / -6.00 (OS). After six months, the postoperative UCVA was 20 / 12.5 in both eyes. In case 3, the preoperative SE was -4.5 (OD) / -2.0 (OS). The UCVA at the six-month follow-up was 20 / 12.5 in both eyes. No adverse events, including corneal haze, occurred in any of the patients. All three of our patients reported excellent visual outcomes following both conventional Epi-LASIK and LED, despite their histories of keloid formation. The present cases suggest that both Epi-LASIK and LED may be safe and effective techniques for myopic patients with dermatologic keloids.

Key Words: Epipolis laser in situ keratomileusis, Keloid, Lamellar epithelial debridement

A keloid is a hyperproliferative growth of dense fibrous tissue that occurs beyond the borders of a wound due to an abnormal healing response to a cutaneous injury [1]. The results of photorefractive keratectomy (PRK) or laser in situ keratomileusis (LASIK) in patients with dermatologic keloids have been contradictory and could potentially be misleading [2-5]. Epipolis (Epi)-LASIK is an alternative surface ablation procedure for refractive surgery [6]. In conventional Epi-LASIK (flap-on), the epithelial sheet is repositioned on the stroma after ablation. Whereas, lamellar epithelial debridement (LED; Epi-LASIK, flap-off) is a modified surface ablation that results in complete removal of the epithelial flap [7].

To the best of our knowledge, neither the healing response nor the visual and refractive outcomes of conventional Epi-LASIK or LED in patients with keloids have been reported previously. In this report, we describe the outcomes of conventional Epi-LASIK and LED in myopic patients with dermatologic keloids that were confirmed via dermatological consultations.

Case Reports

Surgical procedure

Each of the three patients in this study simultaneously received conventional Epi-LASIK in the right eye and LED in the left eye. An epithelial flap was created in both eyes using the Amadeus II (AMO Inc., Santa Ana, CA, USA). We used a blade oscillation speed of 11,000 rpm, a translation speed of 1.5 mm per second, and a vacuum pressure of 800 mmHg, which resulted in 9.0 mm epithelial flaps. The laser treatment was performed using an excimer laser (VISX Star S4; VISX Inc., Santa Clara, CA, USA). After ablation, the epithelial flap was repositioned on the stroma in the right eye and was removed from the left eye. A soft contact lens (Focus, Ciba Vision, Duluth, GA, USA; B.C 8.8 mm, Ф 12.0 mm) was placed onto the eyes at the end of the procedure. In this series of surgeries on a total of six eyes of three patients, the surgeries were performed uneventfully without any epithelial problems.
Postoperative care

Moxifloxacin 0.5% (Vigamox; Alcon, Fort Worth, TX, USA) and prednisolone acetate 1% (Pred Forte; Allergan, Westport, Ireland) eye drops were used every six hours for the first week after surgery. After the first week, 0.1% fluorometholone (Ocumetholone; Samil, Seoul, Korea) was administered four times daily for the first month, twice daily for the following month, and once a day for the third month. Routine postoperative examinations were scheduled at 1 day, 3 days, 1 week, 1 month, 3 months and 6 months from the surgery date.

Case 1

A 25-year-old woman was evaluated for refractive surgery. She was noted to be susceptible to keloid scarring, as demonstrated by the presence of scars on both ears. Preoperative best-corrected visual acuity (BCVA) was 20 / 16 in both eyes. Preoperative spherical equivalent (SE) was -6.5 diopters (D) in the right eye (OD) and -6.25 D in the left eye (OS). Ophthalmic examination was unremarkable except for moderate myopia. Preoperative characteristics and demographics are shown in Table 1.

The uncorrected visual acuity (UCVA) was 20 / 32 (OD) and 20 / 20 (OS) one day postoperatively. At 3 days, 1 week, 1 month, 3 months, and 6 months postoperatively, the UCVA was 20 / 100, 20 / 20, 20 / 20, 20 / 12.5 and 20 / 12.5 (OD) and 20 / 20, 20 / 20, 20 / 16, 20 / 12.5, and 20 / 12.5 (OS), respectively. The patient was invited to a re-examination 21 months after the surgery, when the SE was -0.125 D (OD) and -0.25 D (OS). No adverse events, including corneal haze, were observed in this patient, and her visual acuity remained at 20 / 12.5 in both eyes.

Case 2

A 28-year-old woman was examined for refractive surgery. Her general history revealed a tendency to form keloids, as demonstrated by a scar on her left shoulder (Fig. 1A). Preoperative BCVA was 20/16 in both eyes, and preoperative SE was -5.25 D (OD) and -6.00 D (OS). Ophthalmic examination was normal except for moderate myopia. Preoperative characteristics and demographics are shown in Table 1.

One day postoperatively, the UCVA was 20 / 25 in both eyes. At 3 days, 1 week, 1 month, 3 months, and 6 months postoperatively, the UCVA was 20 / 20, 20 / 20, 20 / 16, 20 / 12.5, and 20 / 12.5 (OD) and 20 / 25, 20 / 20, 20 / 16, 20 / 12.5, and 20 / 12.5 (OS), respectively. At her final examination, the SE was -0.50 D (OD) and -0.25 D (OS). There were no postoperative complications such as corneal haze (Fig. 1B).

Case 3

A woman 32 years of age was referred for refractive surgery. She had a tendency for keloids, which was indicated by the existence of an over-exuberant scar on her lower abdomen (Fig. 2A). Preoperative BCVA was 20/16 in both eyes. Preoperative SE was -4.50 D (OD) and -2.00 D (OS). Her ophthalmic examination was normal except for mild to moderate myopia. Preoperative characteristics and demographics are shown in Table 1.

One day postoperatively, the UCVA was 20 / 50 (OD) and 20/40 (OS). At 3 days, 1 week, 1 month, 3 months and 6

<table>
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<tr>
<th>Case</th>
<th>Age (yr)</th>
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</table>

SE = spherical equivalent; OD = right eye; OS = left eye.

Fig. 1. Photographs of a 28-year-old woman (case 2). (A) Keloid scar on the left shoulder. (B) No subepithelial corneal haze in either eye at six months postoperatively. OD = right eye; OS = left eye.