UNDER-FLAP STROMAL BED CXL FOR EARLY PORT-LASIK ECTASIA: A NOVEL TREATMENT TECHNIQUE

Avi Wallerstein, MD[1,2]; Eser Adiguzel, MD[1]; Mathieu Gauvin, MD[2]; Nima Mohammad-Shahi, MD[1]; Mark Cohen, MD[1,3]

PURPOSE

Collagen cross-linking (CXL) for post-laser-assisted in situ keratomileusis (LASIK) ectasia (PLE) is traditionally performed either epi-on or epi-off on the corneal surface. This study describes a novel technique in treating early PLE with under-flap CXL (ufCXL) to the stromal bed and reports on 6-month outcomes.

PATIENTS AND METHODS

Case series of seven patients (eight eyes) with topography-diagnosed early PLE treated with ufCXL. Inclusion criteria were early, mild PLE defined as new-onset postoperative manifest refraction cylinder ≤1.50 D, with new topographic inferior steepening consistent with ectasia, uncorrected distance visual acuity (UDVA) of 20/40 or better, and corrected distance visual acuity (CDVA) of 20/25 or better. Existing LASIK flap was lifted, riboflavin was applied directly to the stromal bed, flap was repositioned, and 18 mW/cm2ultraviolet light was applied for 3 minutes to the corneal surface. Post-ufCXL manifest refraction, UDVA and CDVA, corneal cylinder, Kmax, and corneal irregularity index were compared with pre-ufCXL measurements.

RESULTS

Patients had a pre-ufCXL sphere of 0.09±0.48 D and cylinder of −0.78±0.49 D. At 6 months, post-ufCXL sphere (0.06±0.8 D; *P*=0.89) and cylinder (−1.09±0.76 D, *P*=0.26) were unchanged. Cumulative post-ufCXL UDVA was unchanged, achieving 20/20, 20/30, and 20/40 in 25%, 88%, and 88%, respectively, compared with 13%, 63%, and 88% pre-ufCXL (*P*=0.68). Post-ufCXL CDVA was

[1] LASIK MD
[2] McGill University
[3] University of Sherbrooke

unchanged (P=0.93) with a gain of one line in two eyes, a loss of one line in one eye, and five eyes unchanged. The efficacy index (P=0.76), safety index (P=0.89), K_{max} (P=0.94), and corneal irregularity index (P=0.73) were also unchanged.

CONCLUSIONS

Preliminary results with ufCXL for early PLE are promising, demonstrating maintenance of visual accuracy, efficacy, safety, K_{max}, and cylinder, with much quicker recovery times than surface CXL.