Excimer Laser Photorefractive Keratectomy in Lebanon

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ABSTRACT

We report on 50 eyes of 50 patients treated by photorefractive keratectomy (PRK) using the Summit Technology OmniMed excimer laser. Follow up ranged from 3 to 9 months, and the eyes were divided into three groups on the basis of the initial myopia (<6.00 diopters [D], 6.00 D to 10.00 D, and >10.00 D). Mean preoperative spherical equivalent refraction in each group was -4.15 D, -7.88 D, and -12.00 D respectively, and -0.24 D, -1.41 D, and -1.70 D postoperatively. Ninety percent in group 1, 56.25% in group 2 and 55.71% in group 3 had a final refraction within 1.00 D of the attempted correction.

Complications consisted of one case of infectious keratitis, medically treated with no sequelae; one case of significant loss of spectacle corrected visual acuity related to corneal haze; and one case of corticosteroid-induced elevated eye pressure controlled with topical treatment.

In this series, PRK appeared to be effective and safe for the correction of myopia of less than -6.00 D. For higher myopia, other methods of treatment should be used. [J Refract Surg. 1995;11(suppl):S270-S273.]

As demand for refractive surgery increased among Lebanese people and as international reports on the results of the excimer laser for the correction of myopia became more encouraging, we started photorefractive keratectomy (PRK) for myopia in December of 1993 with the Summit Technology OmniMed. By September 1994 we had treated 190 eyes of 122 patients. We report on 50 eyes in 50 patients having at least 3 months' follow up and complete required data.

PATIENTS AND METHODS

Photorefractive keratectomy was performed on eyes with myopia greater than -2.00 diopters (D) and with astigmatism less than 2.00 D. Myopia ranged between -2.25 D and -16.50 D (Figure 1). Eyes that exhibited pathological features such as keratoconus, uveitis, retinitis pigmentosa, or previous herpetic disease were excluded.

Patient motivation mostly consisted of avoiding heavy spectacles or contact lenses for professional or personal reasons. Patients were clearly informed about the effect, course, and complications of PRK before the operation.

All 50 patients received a complete preoperative evaluation including manifest and cycloplegic refraction, visual acuity, keratometry, videokeratography, ultrasonic pachymetry, applanation tonometry, slit-lamp microscopy of the anterior segment, and fundus examination. The follow up period ranged from 3 to 9 months (mean 4.56 mo).

The 50 patients were 23 males and 27 females, and ranged in age from 18 years to 50 years (mean 28.8 years). We divided them into three groups (Figure 2) according to the amount of initial myopia: group 1 less than -6.00 D, group 2 between -6.00 D and -10.00 D, and group 3 higher than -10.00 D. In the first two groups, single-step treatment was applied with an ablation zone of 5 or 6 mm. Multistep treatment with two zones of 5 and 6 mm was applied in the high myopia group 3. The attempted goal was emmetropia for all patients.

Just prior to PRK, two drops of tetracaine chlorhydrate 1% were instilled for topical anesthesia. After preparing the patient, manual mechanical removal of the central corneal epithelium (7 mm diameter) was done.

At the end of PRK, topical antibiotic ointment (containing polymyxin B sulfate, neomycin sulfate and bacitracin), cycloplegic eyedrops (cyclopentolate HCl 1%), and eye patch were applied, and an oral analgesic was prescribed to the patient for the first 24 hours. At day one the patch was removed, and antibiotic drops were instilled every 2 hours until total reepithelialization. When this occurred, usually at day three or four, topical corticosteroid (flurometholone 0.1%) eyedrops were started four times daily and then tapered according to the degree.

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and speed of regression. The patient was then examined monthly for visual acuity, refraction, corneal haze, keratometry, and intraocular pressure.

**RESULTS AND COMPILATIONS**

Pain was reported as constant in the first 24 to 48 hours, and disturbed the sleep of all patients the first night. Nevertheless it was quickly forgotten, and subjective satisfaction was very high in all groups at 1 month following the procedure. Overcorrection was present initially and gradually decreased by regression.

In the first group of 20 eyes, mean refraction was $-4.15$ D preoperatively and $-0.24$ D postoperatively; 90% (18 eyes) were within $1.00$ D of the attempted correction. In the second group of 16 eyes, mean refraction was $7.88$ D preoperatively and $-1.41$ D postoperatively; 56.25% (9 eyes) were within $1.00$ D of the attempted correction. In the third group of 14 eyes, the mean refraction was $-12.00$ D preoperatively, and $-1.70$ D postoperatively. Thirty-five percent (5 eyes) were within $1.00$ D of the attempted correction.

Figures 3, 4, and 5 show best corrected visual acuity before and after PRK. One case of significant loss of spectacle corrected visual acuity (3 lines on Snellen chart) occurred in a 40-year-old man with $-14.25$ D of initial myopia who developed severe corneal haze 2 months after PRK. Except for this case, subepithelial corneal haze present in 28 eyes (56%) was trace to grade 1, and tended to gradually decrease after 3 to 6 months.

Corticosteroid-induced elevation of eye pressure occurred in one eye and was easily controlled by
Figure 3: Spectacle corrected visual acuity before (solid bars) and after (open bars) PRK in eyes with less than -6.00 D of myopia.

Figure 4: Spectacle corrected visual acuity before (solid bars) and after (open bars) PRK in eyes with -6.00 to -10.00 D of myopia.
choice for this group in our opinion, preferable to radial keratotomy, which demonstrates significant hyperopic shift with time.35

But the problem remains partially unsolved for moderate and especially high myopes because of frequent undercorrection and possible corneal haze.6 It is our impression that present techniques, such as excimer laser in situ keratomileusis (LASIK), or other future techniques will replace PRK alone in the treatment of moderate and high myopia.

REFERENCES


DISCUSSION

Despite the short follow up of our study, PRK appears to be a simple and safe procedure for the correction of myopia. Its high predictability for less than 6.00 D of myopia (90% within 1.00 D of attempted correction), makes it the procedure of

topical treatment. Another eye in 24 hours showed whitish infiltration of the central cornea suggestive of infectious keratitis (Figure 6). Cultures were negative and the keratitis resolved totally with topical antibiotic treatment, leaving no sequelae. Since this complication we stopped patching the eyes after PRK and realized that patients had much less pain compared to the first protocol. Also the addition of diclofenac, which has a mild anesthetic effect, decreased the intensity of pain.