

# PHOTOTHERAPEUTIC EXCIMER KERATECTOMY

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**SUMMARY** - Phototherapeutic keratectomy with excimer laser is commonly used to treat recurrent corneal erosion syndrome. The aim of this case report is to present success of phototherapeutic keratectomy in patients with recurrent epithelial erosion and persistent epithelial defect following initial treatment with phototherapeutic keratectomy. Phototherapeutic keratectomy provides a therapeutic option for refractory recurrent erosions and persistent epithelial defects. The benefit from phototherapeutic keratectomy is fast reepithelialization of the affected area and quick relief of painful symptoms.

**Key words:** *excimer laser, cornea, erosion, epithelial defects*

## Introduction

Phototherapeutic keratectomy (PTK) may be considered medically necessary for treatment of the following conditions: corneal scars and opacities, anterior corneal dystrophy, recurrent corneal erosion refractory to conservative treatment, and desire to smoothen irregularities of the corneal surface<sup>1</sup>. PTK involves the use of excimer laser to treat visual impairment or irritative symptoms relating to diseases of the anterior cornea by sequentially ablating uniformly thin layers of corneal tissue. A variety of treatments are available for recurrent corneal erosion, reflecting the lack of total efficacy of any single treatment. In the first instance conservative therapy with ocular lubricants is frequently used. More active intervention with a bandage contact lens, epithelial debridement<sup>2</sup>, superficial keratectomy with a diamond burr<sup>3</sup>, anterior stromal puncture<sup>4</sup>, and Nd:YAG laser<sup>5</sup> have been used with a varying success. Recently, several authors have reported the use of excimer PTK for this condition<sup>6-9</sup>.

The purpose of the paper is to present the results of treatment with PTK in two patients.

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## Patients and Methods

We treated 2 eyes in two patients: a 50-year-old female who suffered from therapy-resistant, recurrent epithelial erosion from April 2005. Visual acuity before PTK was VOD: 0.0125; and a 43-year-old male with post-traumatic superficial scar on the left eye following foreign body removal. Visual acuity before PTK was VOS: 0.05. Patients were treated with a MEL 80 Carl-Zeiss 193-nanometer argon-fluoride excimer laser. We used excimer laser in spot-mode under manual guidance, combined with zonal corneal ablation. Ablation depth varied from 7.5  $\mu\text{m}$  to 10  $\mu\text{m}$ , depending on the individual laser parameters. All patients received topical dexamethasone four times daily for 1 week and then twice daily for a week after ablation. The patients wore therapeutic contact lenses for 3 months. In addition, the patients were asked to use paraffin based lubricant nightly for a month after the procedure.

## Results

The epithelium healed in 4 days in both patients. Patients only reported more severe pain on the first day after PTK, which then subsided until epithelial closure. No haze was noted. Visual acuity after PTK was VOD: 1.0 in our female patient and VOS: -1.25 dcyl ax 70=0.9 in male patient.

## Discussion and Conclusion

There are several reports on the treatment of recurrent corneal erosion with PTK<sup>11-18</sup>. The ultimate goal of PTK treatment is good clinical result and patient satisfaction. The PTK procedure results in rapid epithelial healing with quick relief of painful symptoms and improved vision.

## References

1. FAGERHOLM P. Phototherapeutic keratectomy: 12 years of experience. *Acta Ophthalmol Scand* 2003;81:19-32.
2. BROWN N, BRON A. Recurrent erosion of the cornea. *Br J Ophthalmol* 1976;60:84-96.
3. BUXTON JN, FOX ML. Superficial epithelial keratectomy in the treatment of epithelial basement dystrophy. *Arch Ophthalmol* 1983;101:392-463.
4. McLEAN EM, MacRAE SM, RICH LF. Recurrent erosion treatment by anterior stromal puncture. *Ophthalmology* 1986;93:784-7.
5. GEGGEL HS. Successful treatment of recurrent corneal erosions with Nd:YAG anterior stromal puncture. *Am J Ophthalmol* 1990;110:404-7.
6. HOPE-ROSS MW, CHELL PB, KERWICK GN, McDONNELL PJ, JONES HS. Oral tetracycline in the treatment of recurrent corneal erosions. *Eye* 1994;8:384-8.
7. O'BART DPS, KERR-MUIR MG, MARSHALL J. Phototherapeutic keratectomy for recurrent corneal erosions. *Eye* 1994;8:378-83.
8. CAVANAUGH TB, LIND DM, CUTARELLI PE, MACK RJS, DURRIE DS, HASSANEIN KM, GRAHAM CE. Phototherapeutic keratectomy for recurrent erosion syndrome in anterior basement membrane dystrophy. *Ophthalmology* 1999;106:971-6.
9. HO CL, TAN DT, CHAN WK. Excimer laser phototherapeutic keratectomy for recurrent corneal erosions. *Ann Acad Med Singapore* 1999;28:787-90.
10. DINH R, RAPUANO CJ, COHEN EJ, LAIBSON PR. Recurrence of corneal dystrophy after excimer laser phototherapeutic keratectomy. *Ophthalmology* 1999;106:1490-7.
11. DAUSCH D, LANDESZ M, KLEIN R, SCHRODER E. Phototherapeutic keratectomy in recurrent corneal epithelial erosion. *Refract Corneal Surg* 1993;9:419-24.
12. FÖRSTER W, GREWE S, ATZLER U, LUNECKE C, BUSSE H. Phototherapeutic keratectomy in corneal diseases. *Refract Corneal Surg* 1993;9(Suppl):85-90.
13. TUUNANEN TW, TERVO TM. Excimer laser phototherapeutic keratectomy for corneal diseases; a follow-up study. *CLAO J* 1995;21:67-72.
14. JOHN ME, Van Der KARR MA, NOBLITT RL, BOLEYN KL. Excimer laser phototherapeutic keratectomy for treatment of recurrent corneal erosion. *J Cataract Refract Surg* 1994;20:179-81.
15. HERSH PS, BURNSTEIN Y, CARR J, ETWARU G, MAYERS M. Excimer laser phototherapeutic keratectomy: surgical strategies and clinical outcomes. *Ophthalmology* 1996;103:1210-22.
16. FÖRSTER W, ATZLER U, RATKAY I, BUSSE H. Therapeutic use of the 193-nm excimer laser in corneal pathologies. *Graefes Arch Clin Exp Ophthalmol* 1997;235:296-305.
17. MORAD Y, HAVIV D, ZADOK D, KRAKOWSKY D, HEFETZ L, NEMET P. Excimer laser phototherapeutic keratectomy for recurrent corneal erosion. *J Cataract Refract Surg* 1998;24:451-5.
18. JANE S, AUSTIN DJ. Phototherapeutic keratectomy for treatment of recurrent corneal erosion. *J Cataract Refract Surg* 1999;25:1610-4.

## Sažetak

### FOTOTERAPIJSKA KERATEKTOMIJA EXCIMER LASEROM

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Fototerapijska keratektomija excimer laserom se upotrebljava za liječenje opetovanih rožničnih erozivnih sindroma. Cilj prikaza dvaju slučajeva je opisati uspjeh fototerapijske keratektomije kod bolesnika s opetovanom refraktornom epitelnom erozijom rožnice te kod bolesnika s tvrdokornim epitelnim defektom. Navedena metoda predstavlja terapijsku mogućnost u liječenju ovih stanja. Korist od fototerapijske keratektomije je brza reepitelizacija zahvaćenog područja i brzo oslobađanje od bolnih simptoma.

Ključne riječi: excimer laser, rožnica, erozija, defekt epitela