

Consecutive Exotropia after LASIK in a Patient with Accommodative Esotropia

Sepehr Feizi, MD; Khosro Jadidi, MD

Shaheed Beheshti Medical University, Tehran, Iran

Purpose: To report consecutive exotropia after hyperopic laser in situ keratomileusis (LASIK) in a patient with accommodative esotropia.

Methods: A 22-year-old female patient with hyperopia and mild to moderate amblyopia in her right eye was referred for accommodative esotropia. She had undergone right medial rectus recession 4 years ago. Examination revealed right esotropia of 25 and 6 prism diopters (PD) without and with correction, respectively. She underwent LASIK in both eyes to correct the refractive accommodative esotropia. Eight months after LASIK, her refraction was plano-0.75@160 and +0.5-0.75@180 in the right and left eyes respectively, but she developed right exotropia of 20 PD without correction.

Conclusions: Although hyperopic LASIK may be considered as an alternative treatment for refractive accommodative esotropia, the presence of amblyopia and absence of fusion preoperatively increase the risk of postoperative exotropia.

Iran J Ophthalmic Res 2007; 2 (2): 154-156.

Correspondence to: Sepehr Feizi, MD. Anterior segment fellow; Ophthalmic Research Center, Labbafinejad Medical Center, Shaheed Beheshti Medical University, Boostan 9 St., Pasdaran Ave., Tehran 16666, Iran; Tel: +98 21 22585952, Fax: +98 21 22590607, e-mail: sepehrfeizi@yahoo.com

INTRODUCTION

Accommodative esotropia is defined as a convergent ocular deviation associated with activation of the near synkinetic reflex to eliminate blurred retinal images produced by high hyperopic refractive errors.¹ This accommodation can lead to excessive convergence, which eventually exceeds the fusional divergence amplitude, resulting in esotropia.²

Traditional methods of treating accommodative or partially accommodative esotropia include spectacle or contact lens correction of the hyperopic refractive error determined under full cycloplegia.³ Recently, there have been several reports demonstrating the efficacy and safety of keratorefractive surgery for correction of refractive errors and esodeviation in patients with refractive accommodative esotropia.^{4,5}

However, it is important to consider amblyopia and the fusional status of the eyes prior to keratorefractive surgery if ocular alignment is a matter of concern.

Herein, we report a patient with refractive accommodative esotropia who developed exotropia after hyperopic laser in situ keratomileusis (LASIK).

CASE REPORT

A 22-year-old hyperopic female patient with history of right medial rectus recession (5 mm) for correction of the non-refractive component of partially accommodative esotropia 4 years ago, was referred for keratorefractive surgery. Best-corrected visual acuity (BCVA) was 20/50 in the right eye and 20/20 in the left. Deviotometry by prism cover test disclosed right eso-

tropia at distance (RET) of 25 prism diopters (PD) and right esotropia at near (RET') of 30 PD without correction (Fig. 1-a) and RET of 6 PD and RET' of 8 PD with correction (Fig 1-b). Manifest refraction was OD: +6.0-0.75×180 and OS: +6.0-0.5×30; cycloplegic refraction (with cyclopentolate 1.0%) was OD: +7.5-0.5×180 and OS: +7.5-0.5×30. Her stereoacuity measured by Randot Circles (StereoOptical Co., USA) was 200 seconds of arc. Bagolini striated lenses revealed absence of central fusion and only trivial peripheral fusion.

The patient underwent LASIK in both eyes for correction of the manifest refractive error by Keracor Technolas 217 Z Zyoptix 100 excimer laser machine and the Hansatome microkeratome (Bausch & Lomb, Rochester, New York, USA). Three months after LASIK, the results of examinations were as follows: uncorrected visual acuity (UCVA) 20/50 (OD) and 20/20 (OS), manifest refraction plano-0.75×160 (OD) and +0.5-0.75×180 (OS) and cycloplegic refraction +1.5-0.75×160 (OD) and +2.0-0.75×180 (OD). Eight months after LASIK she developed right exotropia at distance (RXT) of 20 PD and right exotropia at near (RXT') of 8 PD (Fig. 2) without correction and RXT of 16 PD and RXT' of 6 PD with correction. Because of cosmetic problems with the recent onset deviation, right lateral rectus recession (8 mm) was performed. Six months after the last operation, deviotometry revealed orthophoria for distance and RET' of 6 and 2 PD without and with correction, respectively.

DISCUSSION

Refractive accommodative esotropia is characterized by high hyperopia (mean +4.75 D; range +3.00 to +10.00 D), moderate angle of esodeviation (20 to 30 PD) and normal accommodative convergence to accommodation [AC/A] ratio (difference of 10 PD or less between distance and near esodeviations).² Looking at an approaching object, accommodation is required to maintain image sharpness at the foveal plane. Concurrently, convergence through the near synkinetic reflex brings the image on the fovea

in both eyes. In axial hyperopic eyes, due to the shorter lens-foveal distance, more accommodation is required. In most people, there is sufficient fusional amplitude to prevent accommodative esotropia; in others however, the accommodative stimulus is accompanied by excessive convergence inducing esotropia.⁴

In refractive accommodative esotropia, correction of refractive errors is essential to eliminate the excessive near synkinetic reflex. This goal can be achieved by different methods including glasses, contact lenses³ and recently, keratorefractive surgery.^{4,5} Miotic agents are another option but have been abandoned because of local and systemic side effects.⁶ Although some authors advocate muscle surgery to correct fully refractive accommodative esotropia, this procedure is usually reserved for the non-refractive component of partially accommodative esotropia.⁷ Maintenance of ocular alignment after treatment of deviations, non-surgically or surgically, depends on several factors such as preoperative stereopsis,⁸ appropriate treatment of amblyopia and good fusion.⁹

To our knowledge, this report is the first case of consecutive exotropia following LASIK, which was performed to correct hyperopia and refractive accommodative esotropia. Absence of adequate fusional amplitude, presence of amblyopia and only gross stereopsis preoperatively, prevented the success of the operation in maintaining ocular alignment. Previous right medial rectus recession further predisposed to the consecutive exodeviation. Before LASIK, medial rectus muscle weakening due to recession had been opposed by the convergence associated with the near synkinetic reflex, but after LASIK there was no stimulus for this reflex leading to outward ocular deviation.

Although, keratorefractive surgery is considered as a safe and effective option for children and adults with refractive accommodative esotropia, it is important to pay attention to the fusional status and visual acuity of patients preoperatively and postpone any muscle surgery after correction of the non-accommodative component by keratorefractive surgery.



Figure 1 Right esotropia without correction (a) and with correction (b) at distance fixation.

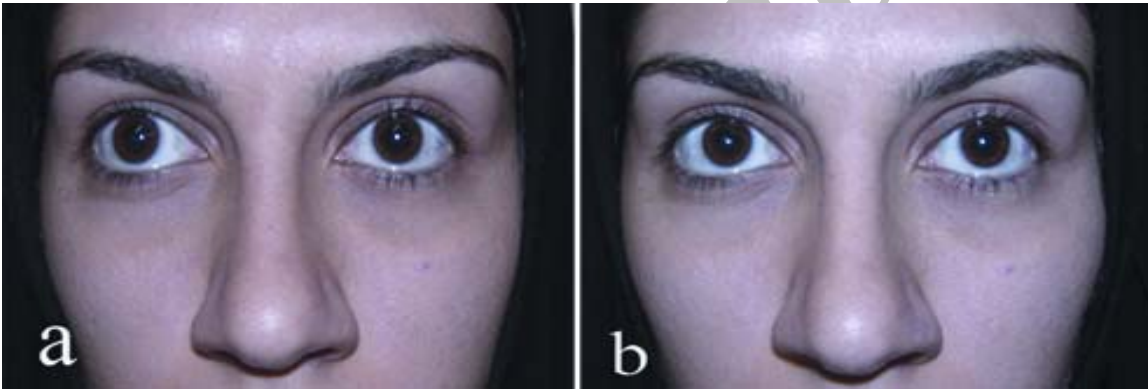


Figure 2 Right exotropia at distance (a) and near (b) fixation.

REFERENCES

1. Parks MM. Ocular motility and strabismus. Hagerstown: Harper & Row; 1975.
2. Parks MM. Abnormal accommodative convergence in squint. *AMA Arch Ophthalmol* 1958;59:364-380.
3. Parks MM. Management of acquired esotropia. *Br J Ophthalmol* 1974;58:240-247.
4. Hoyos JE, Cigales M, Hoyos-Chacon J, Ferrer J, Maldonado-Bas A. Hyperopic laser in situ keratomileusis for refractive accommodative esotropia. *J Cataract Refract Surg* 2002;28:1522-1529.
5. Phillips CB, Prager TC, McClellan G, Mintz-Hittner HA. Laser in situ keratomileusis for high hyperopia in awake, autofixating pediatric and adolescent patients with fully or partially accommodative esotropia. *J Cataract Refract Surg* 2004;30:2124-2129.
6. Diorio PC. The role of miotics in the management of accommodative esotropia. *Am Orthopt J* 1997;27:96-99.
7. Parks MM, Mitchell PR, Wheeler MB. Concomitant esodeviations. In: Tasman W, Jaeger EA (eds). *Duane's clinical ophthalmology*. Philadelphia: Lippincott; 1998: Vol. 1, Chap. 12.
8. Birch EE, Stager DR Sr, Berry P, Leffler J. Stereopsis and long-term stability of alignment in esotropia. *J AAPOS* 2004;8:146-150.
9. Yildirim C, Mutlu FM, Chen Y, Altinsoy HI. Assessment of central and peripheral fusion and near and distance stereoacuity in intermittent exotropic patients before and after strabismus surgery. *Am J Ophthalmol* 1999;128:222-230.