Relationships between Vitreoretinal and Refractive Surgery

Giacomo Panozzo, MD, Barbara Parolini, MD

Objective: To describe retinal complications after posterior chamber phakic intraocular lens (PCPIOL) implantation and refractive surgery complications after scleral buckling surgery.

Design: Retrospective, noncomparative, small case series.

Participants: Four patients in whom retinal detachment developed after PCPIOL implantation and two patients with previously placed encircling scleral buckles in whom corneal steepening developed after laser in situ keratomileusis (LASIK).

Intervention: The four patients with retinal detachment after PCPIOL implantation underwent vitreoretinal surgery. One of the two patients in whom corneal steepening developed after LASIK underwent buckle removal.

Main Outcome Measures: The main parameters evaluated were vitreoretinal findings, corneal topography, and pachymetry.

Results: Retinal attachment was achieved for all patients. Mean postoperative best-corrected visual acuity (BCVA) was 20/30. One patient lost one line of BCVA. One patient with corneal steepening achieved partial corneal flattening after buckle removal.

Conclusions: Vitreous base stimulation related to PCPIOL implantation and manipulation during LASIK may trigger retinal complications. Laser in situ keratomileusis in patients with previously placed scleral buckles may result in unexpected corneal steepening. *Ophthalmology 2001;108:1663–1670 © 2001 by the American Academy of Ophthalmology.*

Myopic eyes have a higher incidence of sight-threatening retinal complications compared with emmetropic and hyperopic eyes.[1–3] Given the increasing number of persons with myopia who require refractive procedures, there likely will be patients undergoing both refractive and vitreoretinal surgery in the near future.

It is essential not only to understand whether refractive surgery causes a higher risk of vitreoretinal complications in persons with myopia but also whether ophthalmologists have to take special precautions when performing refractive or vitreoretinal surgery in eyes that have already undergone the other procedure.

The answers to these questions have not yet been established, although some data are now available, and the personal experiences of various refractive and vitreoretinal surgeons are becoming known.

The goal of this study was to report unexpected complications that occurred after two refractive procedures to treat myopic eyes: posterior chamber phakic intraocular lens (PCPIOL) implantation and laser in situ keratomileusis (LASIK).

Originally received: October 25, 1999.
Accepted: March 26, 2001. Manuscript no. 99440.

From the Vitreoretinal Service, Casa di Cura S. Anna, Brescia, Italy and TECLO, Tecnologie per Chirurgia e Laserterapia Oftalmica, Verona, Italy.

Presented in part at the annual meeting of the American Academy of Ophthalmology, Orlando, Florida, October 1999.

Reprint requests to Giacomo Panozzo, MD, TECLO S.R.L. Via del Perlar, 2, 37135 Verona, Italy.

Methods

Data were collected by retrospectively reviewing the charts of four patients who received PCPIOL implantation for very high myopia and those of two patients who underwent LASIK for high myopia a few years after undergoing encircling buckles placement for retinal detachment.

Results

Posterior Chamber Phakic Intraocular Lens Implantation Patients

Four patients, two men and two women, aged 26 to 35 years, were referred to our Vitreoretinal Service for retinal detachments (RDs) occurring 4 to 8 months after uncomplicated PCPIOL implantation. According to the referring ophthalmologists, examination of the fundus before implantation did not reveal any suspicious retinal lesions.

The main clinical findings of the four patients and their respective vitreoretinal procedures are described in Table 1. All the patients had a barely visible PCPIOL in the posterior chamber, and one had a mild subcapsular cataract. The causes of RDs were: a giant retinal tear in two patients, 4 clock hours wide; a retinal dialysis in one patient, 5 clock hours wide; and a horseshoe tear in one patient. In the cases of giant tears and dialysis, reattachment was obtained as follows: removal of PCPIOL, lensectomy, vitrectomy and implantation of intraocular lens in the posterior chamber, encircling buckle, and gas tamponade. The horseshoe tear–related RD was treated with a scleral buckle.

Published by Elsevier Science Inc.
ISSN 0161-6420/01/$–see front matter
PII S0161-6420(01)00672-8

Table 1. Clinical Findings at the Time of Retinal Detachment and Subsequent Vitreoretinal Procedure in the Four Patients in Whom Retinal Detachment Developed after Posterior Chamber Phakic Intraocular Lens Implantation

Age (yrs)/ Gender	Time (mos)*	Anterior Segment	Best-corrected Visual Acuity before Retinal Detachment, with Posterior Chamber Phakic Intraocular Lens	Best-corrected Visual Acuity after Retinal Detachment	Retinal Lesion Responsible for Retinal Detachment	Postoperative Best-corrected Visual Acuity at 6 Months
26, Male	4	Normal	20/20	20/200	Giant tear	20/30
28, Female	6	Mild cataract	20/30	Count fingers	Retinal dialysis	20/30
32, Female	4	Normal	20/20	20/50	Horse-shoe tear	20/20
35, Male	8	Normal	20/40	Count fingers	Giant tear	20/40

*Time lapse between posterior chamber intraocular lens implantation and occurrence of retinal detachment.

Laser In Situ Keratomileusis Patients

Patient 1. A 27-year-old woman with high myopia experienced RD in the left eye in 1992. Her best-corrected visual acuities (BCVA) and refractions before RD occurred were 20/30 −12 diopters (D) in the right eye and 20/50 −14 D in the left eye. The retina was reattached with an encircling buckle. Six months after surgery, BCVA and refraction of the left eye was 20/60 −17 D.

In 1997, the patient underwent LASIK in both eyes with a Chiron ACS microkeratome by a highly experienced surgeon, who reported technical difficulty in obtaining the appropriate suction with the microkeratome while creating the corneal flap in the left eye because of the alteration in the globe circumference caused by the encircling buckle. The flap thickness was 130 μm. The goal of the refractive procedure was a minor undercorrection to leave a total corneal thickness of no less than 350 μm. The predicted result was reached and maintained for 1 month with a BCVA of 20/60 −2 D, but after that time the patient experienced a progressive regression in the left eye: −4 D 2 months after LASIK, −8 D 4 months after LASIK, and −16 D 1 year later (spherical equivalents). Corneal maps demonstrated progressive increase in corneal curvature up to 51.05 D on one axis and 49.77 D on the other axis (Fig 1), whereas the corneal thickness was stable (350 μm). Believing that the outward forces on the cornea created by the buckle could have been responsible for the corneal steepening, we removed the buckle, obtaining a corneal flattening of approximately 3 D (Fig 2). At this time, her BCVA is 20/60 −13 D.

Patient 2. A 34-year-old woman with monocular myopia of −11 D in the right eye and BCVA of 20/30 experienced an extramacular RD in 1997 as a result of two retinal breaks located in the superior and inferior temporal quadrants. The retina was reattached with an encircling scleral buckle and radial buckle. She decided to have LASIK in this eye in 1998. The refractive procedure was uneventful and left a stromal bed of 225 μm thickness under the flap. Immediate and complete recovery with BCVA of 20/30 was obtained. A progressive corneal steepening (51.1 D on one axis and 48.9 D on the other axis) led to a spherical equivalent regression of 8 D 10 months after LASIK. Pachymetry remained unchanged.

Discussion

Does Refractive Surgery Increase the Risk of Retinal Complications in Myopic Eyes?

Myopic eyes can sustain a major reduction in visual function as a result of three major retinal events: RD, macular hemorrhage, and progressive macular atrophy.[1,3] Retinal detachment is more frequent among those with myopia than among those without myopia because the former more often experience liquefaction of vitreous gel, causing posterior vitreous detachment, asymptomatic retinal breaks, and in patients with lattice and other peripheral degenerations.[1]

It has been calculated that the risk of RD for myopia of more than 5 D is 2.4% during the first 60 years of life, compared with a 0.06% risk in emmetropic subjects.[1] The Eye-Disease Case-Control Study Group published data in 1993[3] on 253 cases of RD and 1138 controls. Cases of pathologic degenerative myopia were excluded. Only one relevant risk factor, myopia, emerged from the analysis. An eye with a spherical equivalent ranging from −1 to −3 D had a fourfold risk of RD when compared with a nonmyopic eye. If the refractive error were more than −3 D, the risk increased 10-fold.

The PCPIOL is a relatively new type of implant that has to be positioned carefully in the posterior chamber of a phakic eye.[4] Information regarding the vitreoretinal risks related to this surgical procedure is still minimal. Zaldivar et al[5] reported one RD among 124 PCPIOL implants observed for 11 months (0.8%). Lovisolo and Pesando,[6] in their book on PCPIOL, refer to cases of RD without giving the exact incidence. At the 1999 ISRS meeting, Lovisolo reported a 1.2% incidence of RD (four cases, two of which were caused by giant tears) among 354 PCPIOL implantations with a mean follow-up of 26 months. These data are in agreement with the incidence of RD reported in previous series of anterior chamber phakic lenses.[7–10]

Reviewing the history of our four patients with RD, the relevant finding is not the occurrence of RD itself in highly myopic eyes, but the unusual occurrence of giant tears and dialysis, also reported after PCPIOL implantations by other investigators.[6]

We are unsure of the mechanism of retinal tear formation after PCPIOL insertion. The anatomy of the retinal breaks indicates that PCPIOL insertion may induce traction on the anterior or posterior margin of the vitreous base, or both. Perhaps anteroposterior movements of the PCPIOL and the crystalline lens, resulting from iris contraction, stress the vitreous base, the anterior hyaloid, and vitreous body. Further studies and additional data are needed to support these or other hypotheses.

Table 2. Case Series of Excimer Laser Surgery (Note the Low Prevalence of Retinal Complications)

Year	Ref No.	Authors	No. Eyes per Treatment	Range of Myopia (D)	Follow-up	Retinal Complications
1998	11	Machat et al	10,000 excimer surgery			1 MAC HEM
1998	12	Talamo, Krueger				2 Fuchs' spots
1992	13	Salz et al	FDA Study, 12 PRK	−1.75/−5	1 yr	None
1993	14	Brancato et al	1165 PRK	−0.8/−25	1 yr	None
1993	15	Lavery	472 PRK	−1.25/−9.6	6 mos	None
1995	16	Amano, Shimizu	60 PRK	−2/−7	6 yrs	None
1995	17	Aron-Rosa et al	265 PRK	−0.7/−19.4	6 mos	None
1995	18	Waring et al	FDA Study, 80 PRK	−2/−6.9	1 yr	None
1996	19	Salah et al	88 LASIK	−2/−20	5.2 mos	2 Fuchs' spots
1997	20	Kim et al	201 PRK	−2.25/−12.5	5 yrs	None
1997	21	Hersh et al	FDA Study, 701 PRK	−1.5/−6	2 yrs	None
1997	22	Loewenstein et al	825 PRK	−2/−10	1 yr	None
1997	23	Gimbel et al	100 LASIK		6 mos	None
1998	24	Maldonado-Bas, Onnis	300 LASIK	−3/−25.5	6–25 mos	None
1998	25	Stephenson et al	83 PRK	−2/−7	6 yrs	None
1998	26	Stulting et al	1062 LASIK	−2/−22.5	9.5 mos	1 RD/1 ERM
1999	27	Ruiz-Moreno et al	1554 LASIK		16–54 mos	4 RD

ERM = epiretinal membrane; MAC HEM = macular hemorrhage; LASIK = laser in situ keratomileusis; PRK = photorefractive keratectomy; RD = retinal detachment.

Excimer Laser Surgery

Retinal complications after excimer laser surgery for myopia are rarely mentioned in textbooks or case series (Table 2).[11–27] The paradox is that retinal complications after excimer laser surgery seem to occur less frequently than in the natural history of myopia. Although available literature does not provide the estimation of the incidence and the possible increased risk of retinal complications after excimer laser surgery, multiple case reports of RDs and macular hemorrhages have recently appeared (Table 3).[28–34]

Several mechanisms may result in adverse vitreoretinal effects of excimer laser procedures in myopic eyes:

1. Shock waves generated by the excimer laser may increase the risk of posterior vitreous detachment and, hence, RD. Because the total energy and the duration of the shock waves increase with the refractive error, higher refractive errors may be associated with a higher risk of retinal complications.
2. Tractional forces on peripheral retina may be created by the suction ring of the microkeratome in LASIK.
3. Blockage of retinal blood flow during suction in LASIK followed by sudden return to regular blood flow when releasing suction could stress the delicate posterior pole in degenerative myopia.

Do We Have to Use Special Precautions Performing Refractive Surgery in an Eye That Already Underwent Scleral Buckling Surgery or Undertake Prophylactic Retinal Treatment of Eyes Undergoing Posterior Chamber Phakic Intraocular Lens Placement?

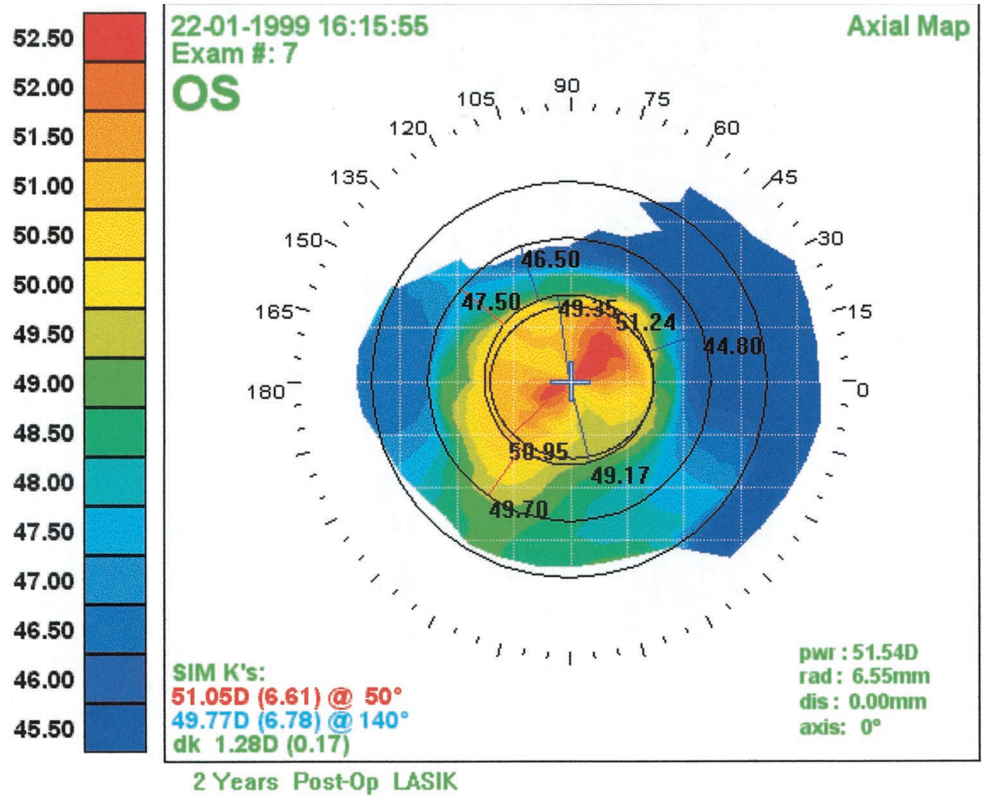
An encircling scleral buckle may create temporary shallowing of the anterior chamber, zonular laxicity with anterior displacement of the lens–iris diaphragm, corneal steepening, and refractive changes.[35–37]

Two cases of corneal steepening that developed 1 month after uneventful LASIK are described in this paper. Before surgery, both eyes had normal corneal thickness and curvature and no preoperative contraindications, and both underwent corneal ablation leaving no less than 220 μm of stroma under the flap. We suspect that in eyes with an encircling scleral buckle, a deep corneal ablation with significant cen-

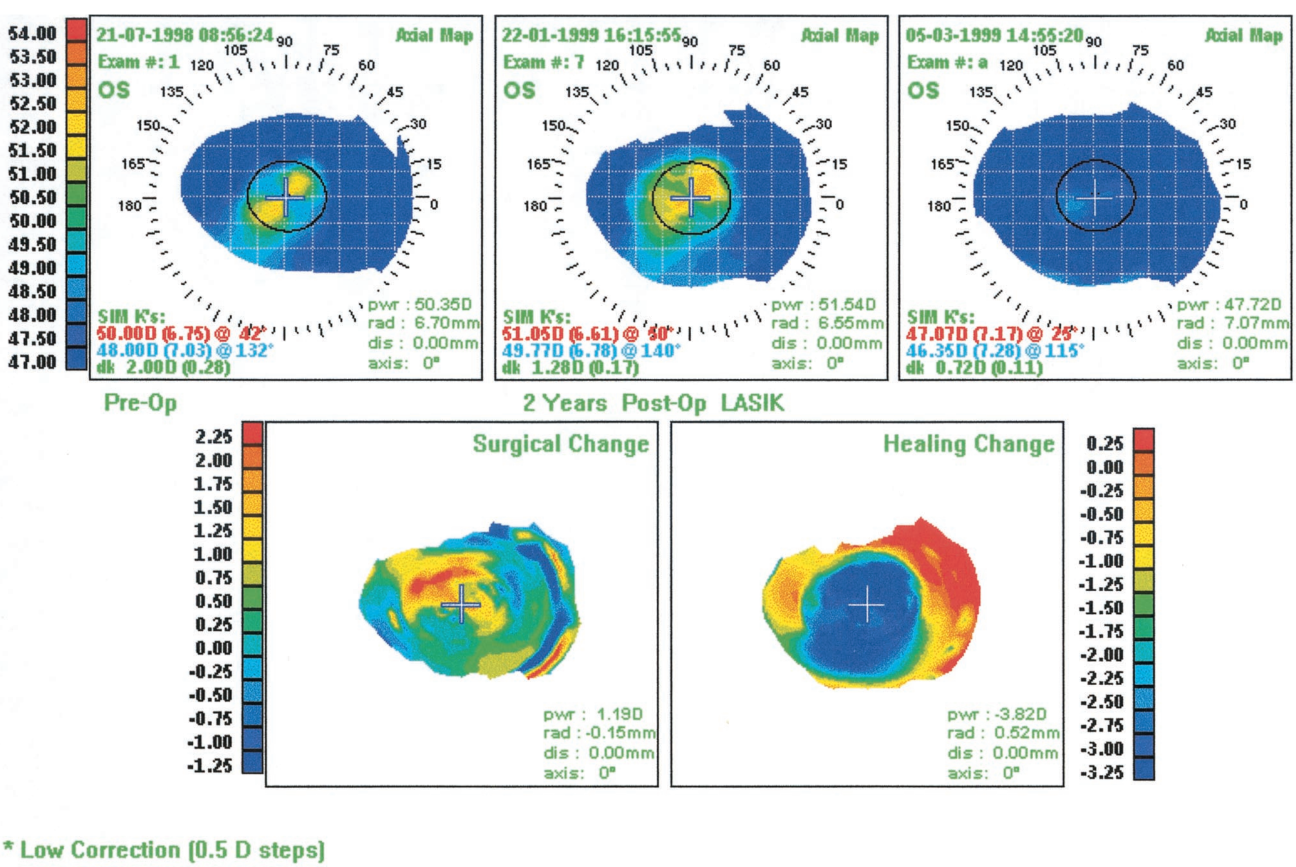
Table 3. Case Reports of Retinal Complications after Excimer Laser Surgery

Year	Ref No.	Authors	Procedure	Retinal Complications
1993	28	Janknecht et al	PRK	1 cystoid macular edema
1996	29	Kim, Jung	LASIK	1 macular hemorrhage (among 18 LASIK for myopia >10 D)
1997	30	Loewenstein et al	PRK	3 macular hemorrhages
1997	31	Charteris et al	PRK or PTK	11 RDs
1998	32	Ozdamar et al	LASIK	Giant tears
1999	33	Vilaplana et al	PRK	2 giant retinal tears
1999	34	Luna et al	LASIK	Bilateral macular hemorrhage

D = diopters; LASIK = laser in situ keratomileusis; PRK = photorefractive keratectomy; RD = retinal detachment.


22-01-1999 16:15:55
Exam #: 7
OS
Axial Map
SIM K's:
51.05D (6.61) @ 50°
49.77D (6.78) @ 140°
dk 1.28D (0.17)
pwr : 51.54D
rad : 6.55mm
dis : 0.00mm
axis: 0°
2 Years Post-Op LASIK

1


21-07-1998 08:56:24
Exam #: 1
OS
Axial Map
SIM K's:
50.00D (6.75) @ 42°
48.00D (7.03) @ 132°
dk 2.00D (0.28)
pwr : 50.35D
rad : 6.70mm
dis : 0.00mm
axis: 0°
22-01-1999 16:15:55
Exam #: 7
OS
Axial Map
SIM K's:
51.05D (6.61) @ 50°
49.77D (6.78) @ 140°
dk 1.28D (0.17)
pwr : 51.54D
rad : 6.55mm
dis : 0.00mm
axis: 0°
05-03-1999 14:55:20
Exam #: a
OS
Axial Map
SIM K's:
47.07D (7.17) @ 25°
46.35D (7.28) @ 115°
dk 0.72D (0.11)
pwr : 47.72D
rad : 7.07mm
dis : 0.00mm
axis: 0°
Pre-Op
2 Years Post-Op LASIK
Surgical Change
pwr : 1.19D
rad : -0.15mm
dis : 0.00mm
axis: 0°
Healing Change
pwr : -3.82D
rad : 0.52mm
dis : 0.00mm
axis: 0°
* Low Correction (0.5 D steps)

2

Figure 1. Corneal topography indicating corneal steepening 2 years after laser in situ keratomileusis (LASIK). The eye underwent retinal surgery with encircling buckle 5 years before LASIK.

Figure 2. Corneal topography before removing the scleral buckle (**top left**), 1 month after removal (**top center**) and 3 months after removal (**top right**). The surgical change map (**bottom left**) shows the slight difference in topography between the situation before removal and 1 month after removal of the buckle. The healing change map (**bottom right**) shows the progressive corneal flattening when comparing topography 1 month and 3 months after removal of the buckle.

tral thinning could lead to corneal steepening. The corneal flattening obtained by removing the buckle in one of our cases seems to support this hypothesis. A flattening of only 3 D (Fig 2) is probably related to the permanent scleral distortion created by the encircling buckle positioned many years before refractive surgery.

In conclusion, we report four cases of RD occurring after PCPIOL implantation and two cases of unexpected corneal steepening occurring after LASIK in patients with a previously placed sceral buckle. This series is too small to conclude that there is an increased risk of vitreoretinal complications in patients with myopia related to refractive surgery or that there is an adverse relationship between vitreoretinal and excimer laser surgery.

While awaiting additional data, vitreoretinal surgeons dealing with an excimer lasered eye should measure corneal thickness before episcleral surgery to avoid possible corneal steepening and should consider vitrectomy with internal tamponade over episcleral surgery (if each approach seems comparable in risks and potential for achieving retinal reattachment).

When the cornea is 350 μm or less in thickness, pre- and postoperative corneal topography measurements are indicated to be able to detect corneal steepening either already present before vitreoretinal surgery or evolving after surgery. Although, based on our case series, it seems that PCPIOL placement may induce a change in the vitreous base not visible before surgery, moderate to highly myopic patients should probably undergo careful examination of the peripheral retina to detect rhegmatogenous retinal lesions that may predispose them to RD (e.g., flap retinal tears), to detect RDs already present, or to document a normal retinal periphery.

Highly myopic patients should undergo careful examination of the posterior pole as well, with or without fluorescein angiography, to detect lacquer cracks. If cracks are present, retinal vascular stress should be minimized during the LASIK procedure by slowly releasing the manual pressure on the suction ring after creation of the flap. Special attention should be given to eyes that already have undergone vitreoretinal surgery, especially scleral buckling surgery, because they may be subject to a higher rate of corneal steepening after LASIK.

References

1. Michels RG, Wilkinson CP, Rice TA. Retinal Detachment. St. Louis: Mosby, 1990;76–84.
2. Risk factors for idiopathic rhegmatogenous retinal detachment. The Eye Disease Case-Control Study Group. Am J Epidemiol 1993;137:749–57.
3. Soubrane G, Coscas G. Choroidal neovascular membrane in degenerative myopia. In: Ryan SJ, editor-in-chief. Retina, Vol. 2. St. Louis: Mosby, 1989;201–7.
4. Assetto V, Benedetti S, Pesando P. Collamer intraocular contact lens to correct high myopia. J Cataract Refract Surg 1996;22:551–6.
5. Zaldivar R, Davidorf JM, Oscherow S. Posterior chamber phakic intraocular lens for myopia of −8 to −19 diopters. J Refract Surg 1998;14:294–305.
6. Lovisolo C, Pesando P. The Implantable Contact Lens (ICL™) and Other Phakic IOLs. Thorofare, NJ: Slack, 1999; 189–90.
7. Alió JL, Ruiz-Moreno JM, Artola A. Retinal detachment as a potential hazard in surgical correction of severe myopia with phakic anterior chamber lenses [published erratum appears in Am J Ophthalmol 1993;115:831]. Am J Ophthalmol 1993; 115:145–8.
8. Alió JL, de la Hoz F, Pérez-Santonja JJ, et al. Phakic anterior chamber lenses for the correction of myopia: a 7-year cumulative analysis of complications in 263 cases. Ophthalmology 1999;106:458–66.
9. Foss AJ, Rosen PH, Cooling RJ. Retinal detachment following anterior chamber lens implantation for the correction of ultra-high myopia in phakic eyes. Br J Ophthalmol 1993:77:212–3.
10. Ruiz-Moreno JM, Alió JL, Pérez-Santonja JJ, de la Hoz F. Retinal detachment in phakic eyes with anterior chamber lenses to correct severe myopia. Am J Ophthalmol 1999;127: 270–5.
11. Machat JJ, Slade SG, Prost LE. The Art of LASIK, 2nd ed. Thorofare, NJ: Slack, 1998;304–5.
12. Pallikaris IG, Siganos DS. LASIK complications management. In: Talamo JH, Krueger RR, eds. The Excimer Manual: A Clinician's Guide to Excimer Laser Surgery. Boston: Little, Brown, 1997:241–2.
13. Salz JJ, Maguen E, Macy JI, et al. One-year results of excimer laser photorefractive keratectomy for myopia. Refract Corneal Surg 1992;8:269–73.
14. Brancato R, Tavola A, Carones F, et al. Excimer laser photorefractive keratectomy for myopia: results in 1165 eyes. Italian Study Group. Refract Corneal Surg 1993;9:95–104.
15. Lavery FL. Photorefractive keratectomy in 472 eyes. Refract Corneal Surg 1993;9:S98–100.
16. Amano S, Shimizu K. Excimer laser photorefractive keratectomy for myopia: two-year follow up. J Refract Surg 1995; 11:S253–60.
17. Aron-Rosa DS, Colin J, Aron B, et al. Clinical results of excimer laser photorefractive keratectomy: a multicenter study of 265 eyes. J Cataract Refract Surg 1995;21:644–52.
18. Waring GO 3rd, O'Connell MA, Maloney RK, et al. Photorefractive keratectomy for myopia using a 4.5-millimeter ablation zone. J Refract Surg 1995;11:170–80.
19. Salah T, Waring GO III, el Maghraby A, et al. Excimer laser in situ keratomileusis under a corneal flap for myopia of 2 to 20 diopters. Am J Ophthalmol 1996;121:143–55.
20. Kim JH, Kim MS, Hahn TW, et al. Five years results of

photorefractive keratectomy for myopia. J Cataract Refract Surg 1997;23:731–5.
21. Hersh PS, Stulting RD, Steinert RF, et al. Results of phase III excimer laser photorefractive keratectomy for myopia. The Summit PRK Study Group. Ophthalmology 1997;104:1535–53.
22. Loewenstein A, Lipshitz I, Varssano D, Lazar M. Complications of excimer laser photorefractive keratectomy for myopia. J Cataract Refract Surg 1997;23:1174–6.
23. Gimbel HV, Penno EE, van Westenbrugge JA, et al. Incidence and management of intraoperative and early postoperative complications in 1000 consecutive laser in situ keratomileusis cases. Ophthalmology 1998;105:1839–47; discussion 1847–8.
24. Maldonado-Bas A, Onnis R. Results of laser in situ keratomileusis in different degrees of myopia. Ophthalmology 1998; 105:606–11.
25. Stephenson CG, Gartry DS, O'Brart DP, et al. Photorefractive keratectomy. A 6-year follow-up study. Ophthalmology 1998; 105:273–81.
26. Stulting RD, Carr JD, Thompson KP, et al. Complications of laser in situ keratomileusis for the correction of myopia. Ophthalmology 1999;106:13–20.
27. Ruiz-Moreno JM, Pérez-Santonja JJ, Alió JL. Retinal detachment in myopic eyes after laser in situ keratomileusis. Am J Ophthalmol 1999;128:588–94.
28. Janknecht P, Soriano JM, Hansen LL. Cystoid macular oedema after excimer laser photorefractive keratectomy [letter]. Br J Ophthalmol 1993;77:681.
29. Kim HM, Jung HR. Laser assisted in situ keratomileusis for high myopia. Ophthalmic Surg Lasers 1996;27:S508–11.
30. Loewenstein A, Lipshitz I, Varssano D, Lazar M. Macular hemorrhage after excimer laser photorefractive keratectomy [a review]. J Cataract Refract Surg 1997;23:808–10.
31. Charteris DG, Cooling RJ, Lavin MJ, McLeod D. Retinal detachment following excimer laser. Br J Ophthalmol 1997; 81:759–61.
32. Ozdamar A, Aras C, Sener B, et al. Bilateral retinal detachment associated with giant retinal tear after laser-assisted in situ keratomileusis. Retina 1998;18:176–7.
33. Vilaplana D, Guinot A, Escoto R. Giant retinal tears after photorefractive keratectomy. Retina 1999;19:342–3.
34. Luna JD, Reviglio VE, Juarez CP. Bilateral macular hemorrhage after laser in situ keratomileusis. Graefes Arch Clin Exp Ophthalmol 1999;237:611–3.
35. Hayashi H, Hayashi K, Nakao F, Hayashi F. Corneal shape changes after scleral buckling surgery. Ophthalmology 1997; 104:831–7.
36. Weinberger D, Lichter H, Loya N, et al. Corneal topographic changes after retinal and vitreous surgery. Ophthalmology 1999;106:1521–4.
37. Michels RG, Wilkinson CP, Rice TA. Retinal Detachment. St. Louis: Mosby, 1990;1028–37.

Discussion by Alvaro Rodriguez, MD

The authors describe (1) four cases of retinal detachment occurring after posterior chamber phakic intraocular lens (PCPIOL) implantation for the correction of high myopia and (2) the refractive surgery complications in two patients with previously placed encircling scleral buckles for retinal detachment in whom corneal steepening developed after laser in situ keratomileusis (LASIK).

The four cases of retinal detachment occurred after PCPIOL implantation, without gender differences, in patients 26 to 35 years of age, and appeared 4 to 8 months after the uncomplicated lens implantation.

Abnormal retinal findings were two giant tears, one retinal dialysis, and one horseshoe tear; preoperative fundus examination had been negative for retinal pathologic features in all four eyes. The patients' management consisted of removal of the PCPIOL, lensectomy, vitrectomy, implantation of an intraocular lens in the posterior chamber, encircling buckling, and gas tamponade. The retinal detachment case resulting from a horseshoe tear was treated with a scleral buckle. The retina was reattached in the four eyes with excellent visual recovery. Of the two patients who experienced giant tears, one recovered 20/40 visual acuity and the other recovered 20/30 visual acuity. The retinal dialysis patient recovered 20/30 vision, and the patient who experienced the horseshoe tear recovered 20/20 vision.

Refractive complications occurred after LASIK surgery in two patients. In the first patient, the medical history indicated a retinal detachment resulting from high myopia in 1992, which was treated successfully with an encircling scleral buckle. The preoperative refractive error in the left eye was −14.00 diopters (D) with 20/50 vision, but 6 months after retinal surgery, myopia increased to −17.00 D with visual acuity 20/60.

In 1997, this patient underwent LASIK, and the refractive surgeon reported difficulties obtaining the corneal flap (of 130 μm) because of alterations in the global circumference caused by the encircling buckle. She regained 20/60 vision, but after 1 month the patient experienced a progressive refractive regression. Thus, from −4.00 D at 2 months after surgery, myopia increased 1 year later to −16.00 D, and the corneal curvature increased to 51 D in one axis and 49.77 D in the other. Management consisted of removal of the scleral buckle to obtain a corneal flattening of 3.08 D and maintaining a best-corrected visual acuity of 20/60, with −13.00 D of correction.

The second patient experienced a similar event, in which an eye with monocular myopia of −11.00 D developed an extramacular detachment in 1997, with two retinal breaks. The retina was reattached with an encircling scleral buckle and a radial buckle. One year later, the patient was treated with LASIK, leaving a corneal stromal bed of 2.25 μm thickness and maintaining her 20/30 preoperative vision. However, a progressive corneal steepening (51.1 D in one axis and 48.9 D in the other axis) led to a spherical equivalent of 8.00 D 10 months after LASIK, maintaining the same corneal thickness.

The authors pose two questions: (1) whether refractive surgery causes a higher risk of vitreoretinal complications in myopes and (2) whether ophthalmologists have to take special precautions when performing refractive or vitreoretinal surgery in eyes that have already undergone other surgical procedures. Although these questions are still controversial, I respond affirmatively to both questions based on previous reports[1–3] and considering the increasing number of vitreoretinal complications after refractive procedures, LASIK included, and in eyes with pathologic myopia.[3]

From the Department of Ophthalmology, Rosario School of Medicine, Bogota, Colombia.

Address correspondence to Alvaro Rodriguez, MD, Department of Ophthalmology, Rosario School of Medicine, Fundacion Oftalmologica Nacional, Calle 50 No. 13-50, Bogota, Colombia.