

Referrals to the Wills Eye Institute Cornea Service after laser in situ keratomileusis: Reasons for patient dissatisfaction

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PURPOSE: To review the symptoms, findings, and management options in patients referred to the Cornea Service who were unsatisfied with results after laser in situ keratomileusis (LASIK).

SETTING: Cornea Service, Wills Eye Institute, Philadelphia, Pennsylvania, USA.

METHODS: A retrospective chart review was conducted of all patients seen for consultation between January 1, 2004, and December 31, 2006, who had LASIK performed elsewhere. The parameters extracted were demographic data, history, symptoms, postoperative best corrected and uncorrected visual acuities, surgical complications, examination findings, and treatment recommendations. The data were also compared with previously unpublished data collected at Wills Eye from 1998 to 2003.

RESULTS: One hundred fifty-seven eyes of 109 patients seen in consultation after LASIK were identified. Twenty-eight percent were referred by the LASIK surgeon and 54%, by another eye doctor; 17% were self-referred. The most common chief complaints were poor distance vision (63%), dry eyes (19%), redness/pain (7%), and glare and halos (5%). Forty-four eyes (28%) had surgical complications or enhancements. The most common diagnoses were dry eye or blepharitis (27.8%), irregular astigmatism (12.1%), and epithelial ingrowth (9.1%). Eleven percent were referred in the first month after LASIK; 23% and 10% were referred between 1 and 6 months and 7 and 12 months, respectively. Medical management (eg, artificial tears, steroids, other dry-eye treatment) was offered in 39% of cases, surgical intervention in 27%, and observation only in 7%. Nonsurgical therapy was offered in 73% of cases.

CONCLUSIONS: Most patients who came for consultation were referred by a doctor other than their LASIK surgeon. Poor distance vision, dry eye, redness/pain, and glare and halos were the most common chief complaints and dry eye or blepharitis, irregular astigmatism, and epithelial ingrowth, the most common diagnoses.

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The ablation of corneal tissue with the excimer laser to treat refractive errors was first reported in 1983 and approved for photorefractive keratectomy (PRK) by the United States Food and Drug Administration (FDA) in 1995.¹ The first study to compare laser in situ keratomileusis (LASIK) and PRK was published in 1994² and showed an advantage of LASIK over PRK in cases of high myopia. Laser in situ keratomileusis received FDA approval in 1999.³ Due to the excellent quality of postoperative vision, rapid recovery time, and minimal discomfort, LASIK quickly became the most popular form of refractive surgery.

However, LASIK is more technically challenging than PRK. Although PRK and LASIK share the risks

of poor refractive results, regression, undercorrection or overcorrection, dry eye, and infection, the creation of the corneal flap during LASIK is an additional surgical step and is associated with added possible side effects and complications. These complications include, but are not limited to, intraoperative flap complications, flap irregularities, keratectasia, infection under the flap, deep lamellar keratitis, and flap dehiscence.^{4–6}

In this study, we examined the charts of patients who presented to our practice for corneal consultation after LASIK surgery performed elsewhere to determine the range of patient complaints, objective findings, and management options. Although PRK is

also associated with surgical complications and unhappy patients, this study examined only unsatisfied patients after LASIK.

PATIENTS AND METHODS

The charts of all patients who presented to Corneal Associates, Cornea Service, Wills Eye Institute, between January 1, 2004, and December 31, 2006, after LASIK performed elsewhere were reviewed. Patients who were seen for routine postoperative care (eg, had moved to the Philadelphia area since their LASIK surgery) were excluded. All patients were examined by 1 of 5 corneal specialists (C.J.R., E.J.C., K.M.H., B.D.A., P.R.L.). The study was approved by the Institutional Review Board of the Wills Eye Institute.

Data abstracted (when available) included age, sex, operative eye(s), eye(s) with symptoms, consecutive versus sequential procedures, location of the flap hinge, date of LASIK surgery, intraoperative complications, date of further surgeries or procedures, source of referral, presenting symptoms, postoperative uncorrected visual acuity (UCVA) and best corrected visual acuity (BCVA), objective findings, and medical and surgical management options. Because of the retrospective nature of this study, some patient records recorded only UCVA or BCVA. To compare the best known vision in all eyes, this study used the term best recorded visual acuity (BRVA). The BRVA was the BCVA when available; when the BCVA was unavailable, the UCVA was the BRVA.

RESULTS

Demographics and Referral Source

One hundred fifty-seven eyes of 109 patients were included; 56 patients (51.4%) were women, and 53 (48.6%) were men. The mean age of the patients at the time of evaluation was 47.1 years \pm 11 (SD) (range 21 to 70 years).

Thirty-one patients (28%) were referred by their LASIK surgeon, 59 (54%) were referred by another eye doctor (ophthalmologist or optometrist), and 19 (17%) were self-referred (word-of-mouth or the Internet).

Time from Surgery to Referral

Figure 1 shows the time from LASIK to referral. The most frequent period for referrals was the 1- to 6-month postoperative period; 43.8% of patients were seen within 1 year of surgery.

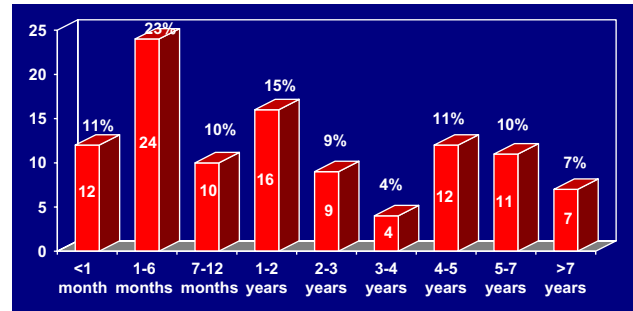


Figure 1. Time from LASIK to referral.

Laterality and Number of Eyes Referred Each Calendar Year

Table 1 shows the laterality of the eyes and the year of the referral. Fifty-six eyes (36%) were referred in 2004, 49 (31%) in 2005, and 52 (33%) in 2006. Some patients with bilateral surgery had complaints in 1 eye only.

Uncorrected Visual Acuity at Referral

The UCVA was documented in 135 eyes. Figure 2 shows the UCVA at the time of initial evaluation. Overall, 64.4% of eyes had a UCVA of 20/40 or better.

Best Corrected Visual Acuity at Referral

The BCVA with glasses ($n = 98$ eyes) or contact lenses ($n = 3$ eyes) was documented in 101 eyes. Figure 3 shows the BCVA at the time of initial referral. No eye had a BCVA worse than 20/200.

Chief Complaint

Charts were reviewed to identify each patient's chief complaint. The chief complaint was poor vision in 99 eyes (63.1%), dry eye in 30 eyes (19.1%), redness or pain in 11 eyes (7.0%), and glare and halos in 8 eyes (5.1%). Nine eyes (5.7%) had another symptom as a chief complaint.

Diagnosis

The most common diagnosis was dry eye or blepharitis (55 eyes) followed by irregular astigmatism (24 eyes) and epithelial ingrowth (18 eyes). Figure 4

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Table 1. Laterality and year of referral.

Year	Bilateral (Right and Left)	Right Eyes	Left Eyes	Total Eyes (%)
2004	34	15	7	56 (36)
2005	32	9	7	49 (31)
2006	30	15	7	52 (33)

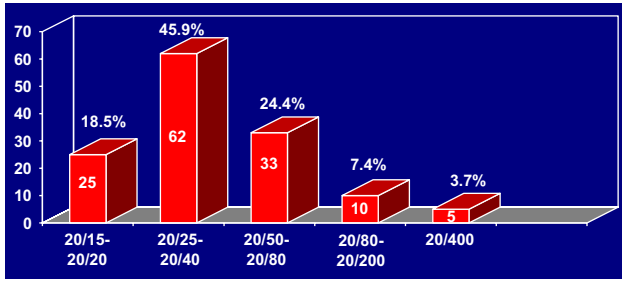


Figure 2. The UCVA at referral.

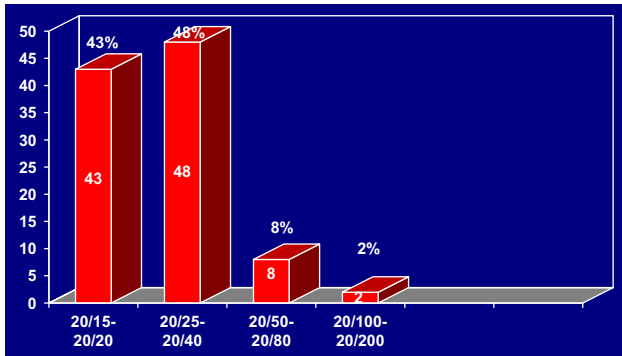


Figure 3. The BCVA at referral.

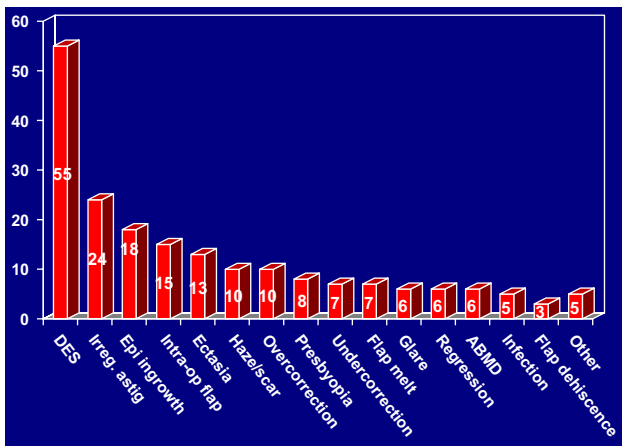


Figure 4. Diagnoses (DES = dry-eye syndrome; Irreg. astig = irregular astigmatism; ABMD = anterior basement membrane dystrophy).

shows all diagnoses; some eyes were counted more than once as they had more than 1 diagnosis.

Surgical History

All patients had previous LASIK surgery. All eyes but 3 (1 each with previous radial keratotomy, astigmatic keratotomy, or cataract surgery) had had no other ocular surgery.

Twelve patients had LASIK in the right eye only, and all had complaints about that eye. One patient had LASIK in the left eye only and had a complaint about that eye. Ninety-six patients had LASIK bilaterally. Patients had complaints about 27 right eyes and 21 left eyes; 48 patients had complaints about both eyes. (Two patients had successful surgery in the right eye but had no excimer laser treatment in the left eye due to complications in flap creation in the left eye.) Eighty-four eyes had nasal hinges, and 59 had superior hinges. (Five eyes had free caps, and data were unavailable or the hinge site was difficult to determine on clinical examination in 9 eyes.)

Intraoperative Complications

Fourteen eyes had intraoperative complications. Free caps occurred in 5 eyes, difficulty with flap creation in 4 eyes (3 with a microkeratome, 1 with femto-second laser), epithelial defect in 2 eyes, and overcorrection due to incorrect parameters entered into the excimer laser in 2 eyes of the same patient. One eye had a significantly decentered flap. All 5 eyes with free caps had further complications. Two eyes had loss of the free cap, 1 had dehiscence of the free cap and subsequent epithelial ingrowth removal, and 1 had significant irregular astigmatism. One eye developed diffuse lamellar keratitis that required prolonged treatment with topical steroids, leading to steroid-induced glaucoma and a trabeculectomy. The 2 eyes that had surgery with incorrect refractive parameters had LASIK enhancements.

Of the 14 eyes with intraoperative complications, 28.6% had a BRVA between 20/15 and 20/20 and 57.1%, between 20/25 and 20/40 (Table 2).

Postoperative Complications and Enhancements

Forty-three eyes had postoperative surgical complications or required enhancements. Twenty-seven eyes of 16 patients had enhancements; of these, 8 eyes were

Acuity	Number of Eyes (%)		
	UCVA	BCVA	BRVA
20/15-20/20	2 (16.7)	2 (22.2)	4 (28.6)
20/25-20/40	5 (41.7)	7 (77.8)	8 (57.1)
20/50-20/80	4 (33.3)	0	1 (7.1)
20/400	1 (8.3)	0	1 (7.1)

BCVA = best corrected visual acuity; BRVA = best recorded visual acuity; UCVA = uncorrected visual acuity

complicated by epithelial ingrowth. Four eyes had more than 1 enhancement. Ten eyes required postoperative flap lifting, and 2 eyes had second flap lifts. Five flap lifts were symptomatic for epithelial ingrowth (2 with flap suturing), and 1 patient (unsutured flap) required a second flap lift for recurrent epithelial ingrowth. One additional flap lift each was due to inflammation, striae, or infection; another was performed to remove debris under the flap. In 1 patient who had a repeat flap lift, the first flap lift was for inflammation and the second was for infection and cultures. Three eyes had LASIK flap dehiscences that were successfully repositioned. Two eyes had amputations of the flap, one due to a *Serratia* infection and the other due to stromal flap melt in the other eye.

Of eyes with enhancements, 37.0% had a BRVA between 20/15 and 20/20, 44.4% between 20/25 and 20/40, and 11.1% between 20/50 and 20/80 (Table 3).

Objective Findings

Of eyes with a primary diagnosis of dry eye or blepharitis, 58.2% had a BRVA between 20/15 and 20/20 and 38.2% between 20/25 and 20/40 (Table 4). No eye with a primary diagnosis of dry eye had a UCVA or BCVA worse than 20/80. The time to presentation of patients with dry eyes was 2.6 ± 2.8 years (median 1.7 years).

Of eyes with irregular astigmatism, 25.0% had a BRVA between 20/15 and 20/20, 66.7% between 20/25 and 20/40, and 8.3% between 20/50 and 20/80 (Table 5). The mean time to presentation of patients with irregular astigmatism was 2.1 ± 2.8 years (median 0.6 years).

Of eyes with epithelial ingrowth, 14.3% had a BRVA between 20/15 and 20/20, 64.3% between 20/25 and 20/40, and 21.4% between 20/50 and 20/80 (Table 6). The mean time to presentation of patients with epithelial ingrowth was 3.2 ± 2.2 years (median 2.5 years).

Of the 13 eyes diagnosed with post-LASIK ectasia, 23.1% had a BRVA between 20/15 and 20/20, 30.8%

Table 4. Visual acuity in cases with a primary diagnosis of dry eye.

Acuity	Number of Eyes (%)		
	UCVA	BCVA	BRVA
20/15–20/20	19 (42.2)	23 (74.2)	32 (58.2)
20/25–20/40	24 (53.3)	7 (22.6)	21 (38.2)
20/50–20/80	2 (4.4)	1 (3.2)	2 (3.6)

BCVA = best corrected visual acuity; BRVA = best recorded visual acuity; UCVA = uncorrected visual acuity

between 20/25 and 20/40, 45.5% between 20/50 and 20/80, and 7.7% between 20/100 and 20/200 (Table 7). Figure 5 shows the mean time to referral of the eyes with post-LASIK ectasia.

Management Offered

Patients seen in consultation were often given several management options. If more than 1 option was given, it was recorded separately. Seventy-six eyes (39%) were offered medical management including artificial tears, steroids, and other dry-eye and blepharitis treatments. Fifty-two eyes (27%) were offered surgical interventions; 18 were offered excimer laser enhancement, 11 corneal transplant surgery (penetrating or lamellar keratoplasty), 9 phototherapeutic keratectomy, 8 flap lifting with removal of recurrent epithelial ingrowth and flap suturing, and 2 eyes each refractive lens exchange, cataract surgery, or removal of epithelial ingrowth without flap suturing. Intacs were recommended in 1 eye. Hard or soft contact lenses were recommended in 34 cases (17%) and corrective glasses in 20 cases (10%). Observation only was recommended in 13 cases (7%). Overall, nonsurgical therapy was offered in 73% of cases.

Table 3. Visual acuity in cases with enhancements.

Acuity	Number of Eyes (%)		
	UCVA	BCVA	BRVA
20/15–20/20	5 (18.5)	5 (26.3)	10 (37.0)
20/25–20/40	9 (33.3)	11 (61.1)	12 (44.4)
20/50–20/80	5 (18.5)	3 (11.1)	3 (11.1)
20/100–20/200	7 (25.9)	0	1 (3.7)
20/400	1 (3.7)	0	1 (3.7)

BCVA = best corrected visual acuity; BRVA = best recorded visual acuity; UCVA = uncorrected visual acuity

Table 5. Visual acuity in cases with irregular astigmatism.

Acuity	Number of Eyes (%)		
	UCVA	BCVA	BRVA
20/15–20/20	2 (9.5)	6 (30.0)	6 (25.0)
20/25–20/40	5 (23.8)	14 (70.0)	16 (66.7)
20/50–20/80	11 (52.3)	0	2 (8.3)
20/100–20/200	3 (14.3)	0	0

BCVA = best corrected visual acuity; BRVA = best recorded visual acuity; UCVA = uncorrected visual acuity

Table 6. Visual acuity in cases with epithelial ingrowth.

Acuity	Number of Eyes (%)		
	UCVA	BCVA	BRVA
20/15-20/20	3 (15.8)	3 (20.0)	5 (14.3)
20/25-20/40	9 (50.0)	8 (53.3)	9 (64.3)
20/50-20/80	3 (21.1)	4 (26.7)	4 (21.4)
20/100-20/200	3 (16.7)	0	0

BCVA = best corrected visual acuity; BRVA = best recorded visual acuity; UCVA = uncorrected visual acuity

DISCUSSION

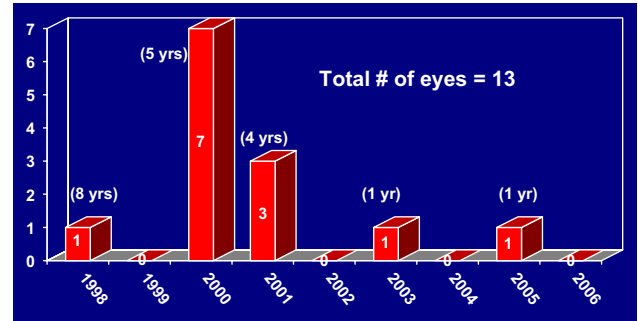
Since the FDA approval of LASIK in the late 1990s, excimer laser refractive surgery has continued to increase in popularity. In 1999, approximately 950 000 refractive surgeries were performed in the United States⁷; in 2006, that number increased to 1.38 million (M. Andrews, "A Lighter, Deftier Touch; Years of Refinement Have Made Laser Eye Surgery Better Than Ever," US News World Report 2007; 143(8):59-61). Laser in situ keratomileusis has captured the imagination of the U.S. public as a painless, safe, and accurate procedure for the correction of refractive errors. Patients who have been referred by friends and relatives are often intrigued by the stories of perfect vision without glasses and have high expectations for similar results. Stories of successful LASIK in the mass media and advertising by ophthalmologists and corporate laser centers help reinforce this belief. Despite the numerous types of refractive surgery available, to the general public LASIK has become synonymous with vision correction.

High expectations are mostly justified as most patients achieve excellent results after LASIK. A large retrospective study by Bailey and Zadnik⁸ examined the FDA data for all 12 lasers approved for LASIK. A statistically significant trend toward improvement was found with advances in laser technology;

Table 7. Visual acuity in cases with post-LASIK ectasia.

Acuity	Number of Eyes (%)		
	UCVA	BCVA	BRVA
20/15-20/20	0	3 (27.3)	3 (23.1)
20/25-20/40	4 (30.8)	4 (36.4)	4 (30.8)
20/50-20/80	2 (15.4)	3 (27.3)	5 (45.5)
20/100-20/200	6 (46.2)	1 (9.1)	1 (7.7)
20/400	1 (7.7)	0	0

BCVA = best corrected visual acuity; BRVA = best recorded visual acuity; UCVA = uncorrected visual acuity

**Figure 5.** Mean time to referral in cases of post-LASIK ectasia.

however, there was no difference in dry-eye symptoms and night-vision complaints between the various laser platforms. Overall, the meta-analysis of the refractive results of the thousands of eyes submitted to the FDA found that LASIK provided UCVA of 20/40 or better in 97% of eyes and 20/20 in 62% of eyes.

One retrospective study of 200 patients after LASIK found that 95% were not using distance glasses.⁹ While approximately one-quarter of the patients interviewed said they felt that night vision and light sensitivity were worse than baseline, 99% stated they would have LASIK again. McGhee et al.,¹⁰ report similar results in a retrospective study of 50 patients after LASIK for myopia, in which 98% of patients reported being satisfied with the refractive outcome. They found that patients seeking refractive surgery were dissatisfied with their uncorrected vision and had high expectations for the results of refractive surgery. Nichols et al.¹¹ evaluated the National Eye Institute Refractive Error Quality of Life questionnaire and validated that myopic persons seeking LASIK had higher expectations for refractive results, less satisfaction with glasses or contact lenses, and a worse self-perception of cosmetic appearance than myopic persons not interested in LASIK.

However, despite the high expectations of patients, complications with LASIK are well known to ophthalmologists. Laser in situ keratomileusis complications can be divided into various categories including anatomic, refractive, functional, infectious, inflammatory, and surgeon error. Anatomic complications include corneal flap irregularities, epithelial ingrowth, anterior basement membrane dystrophy, and keratectasia. Refractive complications include incorrect refractive outcome, irregular astigmatism, decentration, and visual aberrations or loss of visual quality. Dry eyes and increased glare and halos can be considered functional complications because they are a consequence of the alteration in the corneal nerve plexus and reshaping of the cornea respectively. Infection can occur in the early or late postoperative period. Diffuse lamellar keratitis is an inflammatory complication that can be

seen in LASIK flaps created with a microkeratome and might be seen more commonly with the femtosecond laser. Surgeon error includes incorrect patient or parameter settings in the laser or operating on the incorrect eye.^{4-6,12-14}

Over the study period, patients presented with a wide variety of complications and complaints. Previously unpublished data of referrals of patients after LASIK to the Wills Eye Institute Cornea Service from 1997 to 2003 (J.F. Freitas, MD, et al. "Post-LASIK Referral to a Corneal Service—Who Is Unhappy and Why?" paper presented at the Wills Eye Hospital Annual Alumni Meeting, Philadelphia, Pennsylvania, USA, March 2004) were compared with the results in the present study. These results are shown in Figure 6. Very few eyes with complaints after LASIK were examined in 1997 and 1998, representing the infrequency of LASIK at that time. As the popularity of LASIK increased between 1998 and 2001, a corresponding increase in referrals was noted, with a peak of 81 eyes seen in 2001. The number of eyes referred was relatively constant between 2002 and 2006, with approximately 50 eyes seen per year and a slight peak of 76 eyes in 2003.

As might be expected in a group of patients unhappy with refractive surgery, the majority (63%) seen in referral had complaints related to the level or quality of their postoperative vision. The second most frequent complaint was ocular dryness (19%), suggesting that patients whose dry eyes do not resolve after LASIK may remain very symptomatic. (It is our experience that patients with persistent dry eyes after LASIK were among the unhappiest of all patients in this study.) Redness/pain and glare and halos were less common (7% and 5%, respectively).

Only 29% of patients referred for post-LASIK evaluation were referred by their LASIK surgeon. The majority of patients (54%) were referred by another eye doctor, and 17% sought a second opinion themselves

by searching the Internet or asking friends for referrals. Only 44% of patients were seen at the Wills Eye Institute within 1 year of their LASIK surgery, which is the standard postoperative period. The remaining patients were seen more than 1 year after surgery, and 39% were seen 3 or more years after. The fact that most patients were self-referred or referred by other doctors, coupled with the fact that they were often seen several years after the LASIK surgery, suggests that many LASIK surgeons are not aware of their unhappy patients. Our data suggest that more than one half of unhappy patients will present more than 1 year after surgery. Thus, LASIK surgeons are advised to maintain long-term follow-up of refractive patients to ensure patient satisfaction with the surgical results and optimal management of persistent problems.

One perception of unhappy LASIK patients is that they are suffering from poor vision. However, our data show that 18.5% of eyes seen in consultation had a UCVA between 20/15 and 20/20 and 64.4%, of 20/40 or better. Forty-three percent of eyes had a BCVA of 20/15 to 20/20 and 91%, of 20/40 or better. In this cohort of patients seen in consultation after LASIK complications, only 10% had a BCVA of 20/50 or worse. This result suggests the importance of quality of vision over measured traditional Snellen acuity. Many patients with excellent Snellen acuity were quite unhappy with the quality of their vision.

The most common diagnosis was dry-eye syndrome. Although some patients presented with classic dry-eye symptoms, many presented with generalized visual complaints and unhappiness with visual quality. While dry eyes was the most common diagnosis, the UCVA remained quite good in these patients, with 42% having a UCVA between 20/15 and 20/20 and 53% between 20/25 and 20/40. Despite relatively good UCVA, these patients were quite dissatisfied with the results of the LASIK surgery.

The next most common diagnoses were irregular astigmatism, epithelial ingrowth, intraoperative flap complications, and ectasia. The UCVA was not as good in these subgroups as in the group with dry eyes. More than half the patients with irregular astigmatism (52%) had a UCVA of 20/50 to 20/80. More than half the patients with epithelial ingrowth (55%) had a UCVA between 20/25 and 20/40; however, there was a large range of UCVA (17% between 20/15 and 20/20; 27.8% 20/50 or worse).

Eyes with intraoperative complications had visual results similar to those in the subgroup of patients with irregular astigmatism. This may be partially attributable to the overlap in diagnosis between complications with flap creation and induced irregular astigmatism. Half the eyes with intraoperative complications had a UCVA between 20/25 and 20/40 and

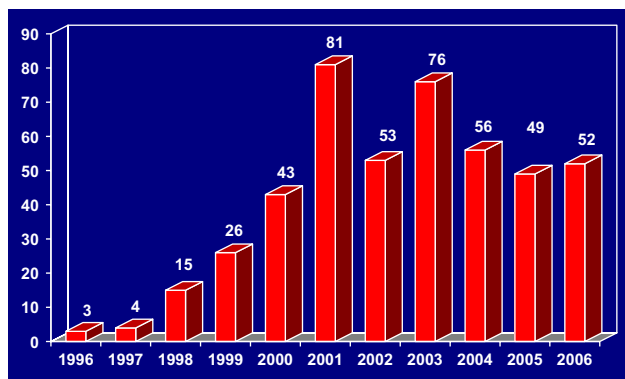


Figure 6. Number of eyes seen in referral from 1996 through 2006 at Wills Eye.

one third, between 20/50 and 20/80; only 1 eye (8.3%) had a UCVA between 20/15 and 20/20.

Eyes with post-LASIK ectasia had the worst UCVA of the groups analyzed. Fifty-seven percent of eyes had a UCVA between 20/100 and 20/400, and no eye had a UCVA better than 20/30. These patients did have improvement in vision with correction, and their vision may have improved more if all had been given trials of rigid gas-permeable contact lenses. Of the 13 eyes with ectasia, 11 had LASIK surgery before 2002. This may suggest that ectasia is becoming less common as surgeons are more aware of the risk factors for ectasia. However, it is possible that mild asymptomatic ectasia cases take an extended period after LASIK to present with frank ectasia.

Medical management was the most frequent recommendation, and this often consisted of optimizing the ocular surface. Surgical options, including enhancements, were the next most common recommendation, followed by contact lenses and glasses.

Our data are comparable to those in other studies of unsatisfied patients after refractive surgery. Jabbur et al.¹⁵ reviewed 161 eyes of 101 patients seen between June 1999 and January 2003 after any type of refractive surgery. (The initial surgery was LASIK in 134 eyes.) They found the most common complaints were poor distance vision (59%), glare and decreased night vision (43.5%), and dry eyes (21.1%). These findings are similar to our results in that the most common chief complaint was directly related to decreased visual acuity and quality, with dryness as the second most common complaint. Jabbur et al. also recommended medical management in 68% of eyes, similar to our result of 73%.

However, Jabbur et al.¹⁵ found that the most common diagnoses in their patient population were overcorrection (30.4%), irregular astigmatism (29.8%), and dry eyes (29.8%). More than half the eyes (52.2%) had a UCVA of 20/40 or worse and 24.2% had a UCVA of 20/70 or worse. In contrast, in our sample approximately one-third of eyes (35.6%) had a UCVA worse than 20/40. Eleven percent of eyes had a UCVA of 20/80 or worse. This disparity is possibly explained by the differing time periods of the respective studies. Better technologies and surgeon experience between 2004 and 2006 may have led to less overcorrection (the most common diagnosis found by Jabbur et al.) than in 1999 to 2003. We found overcorrection to be much less common than in Jabbur et al.'s study and dry eyes to be more common, which may explain our better UCVA results.

In the unpublished study by Freitas et al. cited above, which examined unhappy post-LASIK patients seen in consultation in the Cornea Service at Wills Eye Hospital between January 1996 and December 2003,

187 patients with 301 symptomatic eyes were seen. The most common diagnoses were irregular astigmatism (57.8%), dry eyes (28.2%), and symptomatic striae (21.3%). Intraoperative flap complications were seen in 18% of eyes; UCVA of 20/30 or better was noted in 51.2% of eyes. In contrast to our study, Freitas et al. found that irregular astigmatism was the most common diagnosis and dry eye was second. This may represent the improving technologies and techniques, which may make irregular astigmatism less common. In the Freitas et al. study, 64% of eyes were referred for problems treatable with medication, contact lenses, or spectacles. This is similar to our recommendation of nonsurgical treatment in 73% of eyes.

In conclusion, most LASIK patients are happy. In this study we examined patients who remained unhappy, and often remained persistently unhappy, after LASIK. An understanding of the leading causes of dissatisfaction after LASIK will help surgeons screen patients better, with careful attention to dry-eye signs and symptoms, and offer preoperative counseling to ensure realistic expectations.

Most patients were not referred by their LASIK surgeon, and this may represent the reality of co-management. However, it may suggest that some patients become disenchanted with surgeons who state that their results are excellent given the Snellen acuity while the patient remains unhappy with the quality of their vision. Laser in situ keratomileusis surgeons and their staff must provide customized support to patients who are less than happy or have suboptimal results.

Over half our referred eyes had a UCVA better than 20/40. Surgeons must be cautious in telling patients that their vision is great based on Snellen acuity; rather, they must attempt to understand that the symptoms may be related to visual quality. Attention must be paid to overall refractive results in a functional setting (eg, driving, computer work, differing contrast situations) to better evaluate which patients are not satisfied and to institute appropriate management.

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