

Myopic LASIK in Psychiatric Patients

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Purpose: To evaluate the surgical results obtained in patients with psychiatric disorders who underwent myopic laser in situ keratomileusis (LASIK).

Methods: Retrospective study of 156 eyes of 82 patients who underwent LASIK to correct a myopic spherical equivalent (SE) at Clínica Baviera–Instituto Oftalmológico Europeo, Bilbao, Spain. All procedures were performed with the Technolas Keracor 217 Z excimer laser. Patients had a preoperative diagnosis of bipolar disorder (79 eyes of 42 patients), schizophrenia (61 eyes of 32 patients), or obsessive–compulsive disorder (16 eyes of 8 patients). Before surgery, the average sphere of the series was -3.92 ± 2.24 D in the first group, -3.45 ± 2.03 D in the second group, and -3.39 ± 1.97 D in the third group. We surveyed the patients to analyze subjective assessment from the patient's perspective.

Results: At the last available visit after treatment, we obtained an SE of ± 0.50 D in 85.71% of eyes with bipolar disorder, 88.52% of eyes with schizophrenia, and 93.75% of eyes with obsessive–compulsive disorder. The efficacy index was 1.00 ± 0.20 in the first group, 1.03 ± 0.21 in the second group, and 1.00 ± 0.07 in the third group. No eye lost 2 lines or more of best spectacle–corrected visual acuity.

Conclusions: We found that patients with compensated psychiatric disorders, of which the surgeon was aware, achieved excellent results after surgery, with no remarkable complications. Patients tolerated the procedures well and were satisfied.

Key Words: LASIK, refractive surgery, psychiatric patients

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Laser in situ keratomileusis (LASIK) is one of the most commonly performed and successful surgical procedures. However, approximately 5% of patients are not satisfied with

the results: poor postoperative uncorrected visual acuity (UCVA), dry eye, pain, halos, glare, and decreased visual acuity (VA) at night have been reported to be among the common causes of patient dissatisfaction after LASIK.^{1,2}

Postoperative complaints after LASIK have also been attributed to unrealistic patient expectations, patient personality, and psychopathologic conditions, such as preoperative depression.³ Patients with psychiatric disorders may express dissatisfaction with surgical results. Depressive individuals have been shown to have poorer outcomes after surgery, including coronary artery bypass grafting, traumatological procedures, digestive procedures, and aesthetic surgery.^{4–9} Some psychiatric conditions seem to be particularly related to a higher rate of post-LASIK complications. These include flap dislocation after abnormal rubbing in patients with obsessive–compulsive disorder or borderline mental illness.^{10,11}

The aim of this study was to evaluate the results of surgery in patients with psychiatric disorders who underwent LASIK. The hypothesis was that patients with psychological illnesses would report lower levels of VA, poorer outcome, and more perioperative complications. The results are intended to provide general guidance for the refractive surgeon treating patients with psychiatric disorders.

PATIENTS AND METHODS

The present study evaluated the clinical records of a private ophthalmologic institution (Clínica Baviera) with 22 centers and 70 surgeons throughout Spain. From October 2002 to December 2008, we retrospectively analyzed the clinical history of 82 patients (156 eyes) who had undergone consecutively myopic LASIK and were diagnosed with bipolar disorder (79 eyes of 42 patients), schizophrenia (61 eyes of 32 patients), or obsessive–compulsive disorder (16 eyes of 8 patients). This group of patients represented 0.3% of all myopic LASIK procedures performed during this period.

We did not study patients with depression or anxiety because many patients who wish to undergo LASIK are taking antidepressants, sedatives, or tranquilizers without a confirmed psychiatric diagnosis. The 3 diseases we studied were considered when there was a validated diagnosis with a psychiatric medical report.

Apart from the psychiatric disease, the inclusion criteria were age 23 years or older and stable refraction for at least 2 years. The exclusion criteria were topographic evidence of keratoconus, active ocular disease, pregnancy, and severe medical condition.

Patients were asked to obtain their psychiatrist's permission to undergo surgery. The surgeons did not talk to

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the psychiatrists personally. Informed consent was obtained from all patients who were legally able at the time of surgery.

Up to 30 different surgeons performed the primary LASIK procedures. All of them followed the same standardized preoperative protocol: UCVA, subjective correction with and without cycloplegia, best-corrected visual acuity, biomicroscopy, tonometry, binocular ophthalmoscopy, ultrasonic pachymetry (DGH Technology, Inc), keratometry, and corneal topography (Orbscan; Orbtex, Inc).

The same surgical protocol was used in all eyes. Topical anesthesia (tetracaine) and the Moria LSK One manual microkeratome were used in all patients. A nasal hinged corneal flap was created using Moria's H or -1 suction rings and 100- or 130- μ m plates. The Technolas Keracor 217 Z excimer laser (PlanoScan program; Bausch & Lomb) was used to perform the corneal ablation, and a 6.0-mm optical zone (with a peripheral transition zone of 9.0 mm) was programmed in all cases.

Postoperative treatment involved topical tobramycin-dexamethasone eye drops for 1 week and lubricant tears for several months. Follow-up was at least 3 months in every case (bipolar group, 149.63 \pm 94.55 days; schizophrenic group, 149.95 \pm 137.35 days; and obsessive-compulsive group, 144.44 \pm 82.87 days).

Visual Result and Predictability Indicators

We analyzed the following parameters:

- Efficacy: percentage of eyes with a postoperative UCVA that was equal to or better than the preoperative best spectacle-corrected visual acuity (BSCVA). The efficacy index was calculated as postoperative UCVA/preoperative BSCVA.
- Safety: percentage of eyes that lost more than 2 lines (Snellen) of BSCVA after the procedure compared with the preoperative BSCVA. The safety index was calculated as postoperative BSCVA/preoperative BSCVA.
- Predictability: percentage of eyes within ± 1.00 D [spherical equivalent (SE)] of the intended correction after the procedure.

These parameters were recorded using the last refraction available after treatment and the refraction recorded at the most recent examination.

Subjective Assessment From the Patient's Perspective

At least 3 months after surgery, we gave a questionnaire to the patients. The patients were asked to fill in the questionnaire and give it back personally or to send it by mail. However, not all surveys were returned. We analyzed the following parameters:

- Satisfaction with treatment: percentage of patients who ranked the treatment as 8/10 or better (on a scale of 0 to 10).
- Satisfaction with outcome: percentage of patients who ranked the result as 8/10 or better (on a scale of 0 to 10).
- Quality of life: percentage of patients who considered that their quality of life improved after surgery.
- Percentage of patients who would undergo surgery again.
- Percentage of patients who would recommend surgery.
- Percentage of patients who would recommend the surgical institution.

RESULTS

Eighty-two patients (156 eyes) received LASIK to correct myopia or myopic astigmatism. The mean age of the 36 women and 46 men was 37.19 \pm 8.19 years (range, 20–54 years). The distribution of eyes by age was as follows: 42 eyes of 22 patients aged 21 to 30 years; 70 eyes of 36 patients aged 31 to 40 years; 35 eyes of 19 patients aged 41 to 50 years; and 9 eyes of 5 patients older than 50 years (Table 1).

All the patients with bipolar disorder were taking lithium. Among the schizophrenic patients, 9 were taking olanzapine, 6 haloperidol, 2 risperidone, 2 fluphenazine, 1 perphenazine, 1 ziprasidone, 1 clozapine, and 1 zuclopenthixol. Further details on drugs taken by the patients are unavailable because data were missing from the records in some cases.

The preoperative data were rather homogeneous in all groups. The presurgery average manifest SE (around -4 ± 2), mean spherical refraction, mean astigmatism (around -1 ± 1), and mean keratometry are shown in Table 2.

The mean preoperative and postoperative UCVA is shown in Table 2 and Figure 1.¹² More than 80% of patients achieved UCVA of 20/20 or better after surgery.

The mean preoperative and postoperative BSCVA is shown in Table 2 and Figure 2.¹² Only 2.5% of bipolar disorder

TABLE 1. Sex and Age

	Bipolar Disorder	Schizophrenia	Obsessive-Compulsive Disorder	Total
No. eyes	79	61	16	156
Sex, n (%)				
Male	39 (49.37)	38 (62.30)	12 (75.00)	89 (57.05)
Female	40 (50.63)	23 (37.70)	4 (25.00)	67 (42.95)
No. patients	42	32	8	82
Sex				
Male	20	20	6	46 (56.10)
Female	22	12	2	36 (43.90)
Age, yr (mean \pm SD)	min 24; max 54 (37.00 \pm 7.99)	min 20; max 53 (36.36 \pm 8.56)	min 23; max 41 (31.88 \pm 6.33)	min 20; max 54 (36.04 \pm 7.99)

min, minimum; max, maximum.

TABLE 2. Preoperative Refractive Data

	Bipolar Disorder	Schizophrenia	Obsessive–Compulsive Disorder	Total
No. eyes	79	61	16	156
Sphere (D)	-3.92 ± 2.24 (min -0.50; max -9.50)	-3.45 ± 2.03 (min -0.50; max -9.50)	-3.39 ± 1.97 (min -0.75; max -7.75)	-3.68 ± 2.14 (min -0.50; max -9.50)
Astigmatism (D)	-1.08 ± 1.00 (min 0.00; max -3.65)	-1.04 ± 1.10 (min 0.00; max -5.75)	-0.97 ± 0.93 (min 0.00; max -3.00)	-1.05 ± 1.03 (min 0.00; max -5.75)
SE (D)	-4.46 ± 2.19 (min -1.00; max -11.62)	-3.97 ± 1.98 (min -0.87; max -10.00)	-3.88 ± 2.01 (min -0.87; max -10.00)	-4.21 ± 2.10 (min -0.87; max -11.75)
Mean K (D)	43.60 ± 1.33 (min 41.00; max 47.00)	43.26 ± 1.43 (min 40.00; max 46.50)	43.42 ± 1.15 (min 41.50; max 45.00)	-43.45 ± 1.36 (min 40.00; max 47.00)
UCVA	0.07 ± 0.09 (min 0.02; max 0.40)	0.07 ± 0.10 (min 0.02; max 0.50)	0.09 ± 0.10 (min 0.02; max 0.20)	-0.07 ± 0.09 (min 0.02; max 0.50)
BSCVA	0.93 ± 0.13 (min 0.50; max 1.20)	0.91 ± 0.12 (min 0.50; max 1.00)	0.94 ± 0.09 (min 0.70; max 1.00)	-0.92 ± 0.12 (min 0.50; max 1.20)

eyes lost 1 line of Snellen VA. The rest of patients stayed or improved their preoperative BSCVA.

Efficacy and safety are shown in Table 3. Efficacy was more than 78% in all groups; none of the patients lost more than 2 lines of VA.

Predictability is shown in Table 3 and Figures 3 and 4.¹² It was more than 96% in the total group of psychiatric patients. The efficacy index was 1.00 ± 0.20 in the first group, 1.03 ± 0.21 in the second group, and 1.00 ± 0.07 in the third group.

Post-LASIK SE was ±0.50 in more than 80% of eyes and ±1 in nearly 100% of eyes (Fig. 3). Post-LASIK defocus equivalent was <1 D in more than 90% (Fig. 4).

No serious complications (eg, infections, diffuse lamellar keratitis, slipped/displaced flap, epithelial ingrowth) were recorded during or after surgery. Two eyes were enhanced in the bipolar group and 3 eyes in the schizophrenic group; no enhancement was performed in the obsessive–compulsive group.

Data on satisfaction are shown in Table 4. Sixty-two of the 82 patients (75%) answered our questionnaire. The rate of satisfaction with the results was especially good in the schizophrenia group. More than 97% stated that their quality of life had improved and would undergo surgery again.

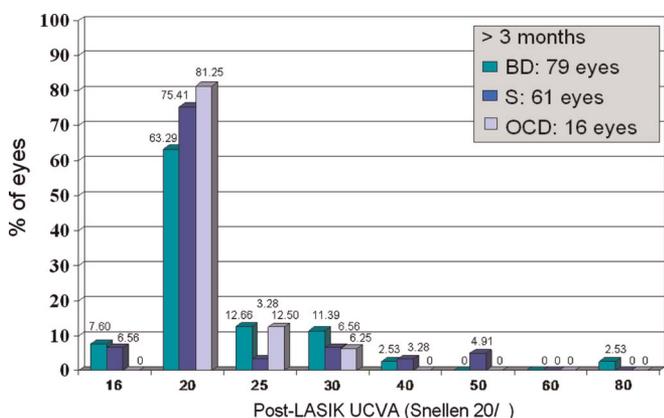


FIGURE 1. UCVA bar graph. BD, bipolar disorder; OCD, obsessive–compulsive disorder; S, schizophrenia.

DISCUSSION

Previous research on LASIK in patients with psychiatric conditions has focused either on the preoperative profile of the patient seeking LASIK^{13,14} or on patient satisfaction after the procedure.^{3,15–17} To our knowledge, no published studies have investigated the clinical outcome of psychiatric patients after LASIK.

Although this is a retrospective study involving many centers and surgeons, data collection and classification were consistent because every surgeon used the same protocol, the same questionnaire, and the same software to record the clinical history. Consequently, there were no missing data in the calculation of the visual results and predictability indicators.

We show the results obtained after LASIK in patients diagnosed with schizophrenia, bipolar disease, or obsessive–compulsive disorder. Patients with depressive symptoms were excluded (see Patients and Methods). We found that patients with compensated psychiatric disorders, of which the surgeon was aware, achieved excellent results after surgery, with no remarkable complications. The association observed between depression and poor postoperative outcome³ may be because of the fact that these individuals were not stable: the results

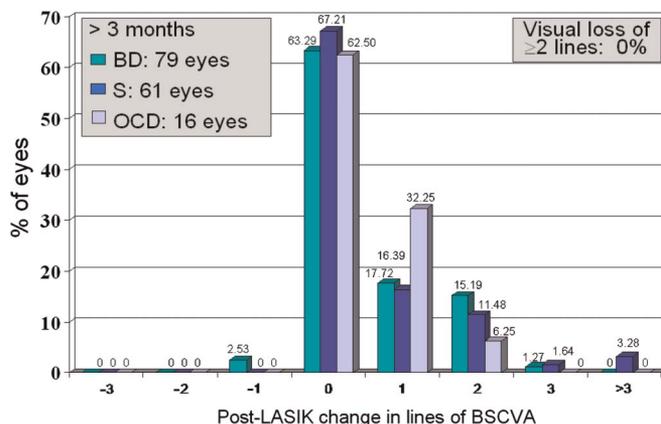


FIGURE 2. Change in BSCVA. BD, bipolar disorder; OCD, obsessive–compulsive disorder; S, schizophrenia.

TABLE 3. Parameters of Visual and Predictability Results

	Bipolar Disorder	Schizophrenia	Obsessive–Compulsive Disorder	Total
Efficacy (% eyes) (postoperative UCVA ≥ preoperative BSCVA)	78.48	85.25	100	87.82
Efficacy index (postoperative UCVA/preoperative BSCVA)	1.00 ± 0.20	1.03 ± 0.21	1.00 ± 0.07	1.01 ± 0.19
Safety (% eyes) (preoperative – postoperative BSCVA ≥2 lines)	0	0	0	0
Safety index (postoperative BSCVA/preoperative BSCVA)	1.07 ± 0.11	1.08 ± 0.13	1.05 ± 0.08	1.07 ± 0.12
Predictability (% eyes) within ±1.0 D	97.47	93.44	100	96.15

might have been better if the depressive symptoms had been treated in advance. Our results are similar to those of other articles studying LASIK for myopia in general population.^{18,19}

In our study, the patients had already received a psychiatric diagnosis, which they reported to the ophthalmic surgeon. They were therefore aware of their disease, and this was indicative of a favorable prognosis. We believe that the ophthalmic surgeon must ensure that a patient with psychiatric disease is stable and that the psychiatrist has approved the surgical procedure. In addition, the surgeon must feel that the patient is a good candidate after the visit and a discussion of the procedure, benefits, and risks.

However, in daily surgical practice, some psychiatric patients may not have been diagnosed or may have deliberately concealed their illness. This makes for a poorer physician–patient relationship and can affect the efficacy of therapy.^{20,21} Our study is limited, in that undiagnosed patients were excluded.

When an undiagnosed psychiatric disorder is suspected, we advise against immediate surgery. The patient should first be diagnosed with the help of information provided by family members or the primary care physician and then referred to a psychiatrist for appropriate treatment before undergoing surgery.

We must also remember that psychiatric patients often take psychoactive drugs, which can present a number of adverse effects and interactions. The most important issue for the refractive surgeon is that many drugs have a more or less

significant anticholinergic component. These drugs can produce mydriasis, make miosis difficult, and inhibit tear secretion. Such effects are usually accompanied by dry mouth, which is easily detectable. Consumption of cannabis (widespread among young people) produces a miotic effect lasting several hours.

If local anesthesia is administered with sedation, it is important to remember that high-dose benzodiazepines inhibit the respiratory center and that most selective serotonin reuptake inhibitors affect different subtypes of cytochrome P450, thereby reducing the clearance of certain substances. Other drugs, such as lithium or some anticonvulsants, may also produce neuro-ophthalmologic side effects, which are usually accompanied by signs and symptoms that guide diagnosis.

Although a series of objective measures of refractive outcome is hardly an indication of satisfaction in this population, one would expect the refractive outcomes to be identical to those of the general population. It was reasonable to expect that satisfaction with treatment or outcome might be affected by the psychiatric disease. However, our results show that patients tolerated the procedures well and were satisfied with the outcome.

Our study shows that patients with severe psychiatric disorders (schizophrenia, obsessive–compulsive disorder, and bipolar disorder) who are stable can be good candidates for LASIK. It is important to detect and exclude patients who are not diagnosed or reported. We should take into account the presence of anticholinergic effects that can interfere with surgery and take appropriate action.

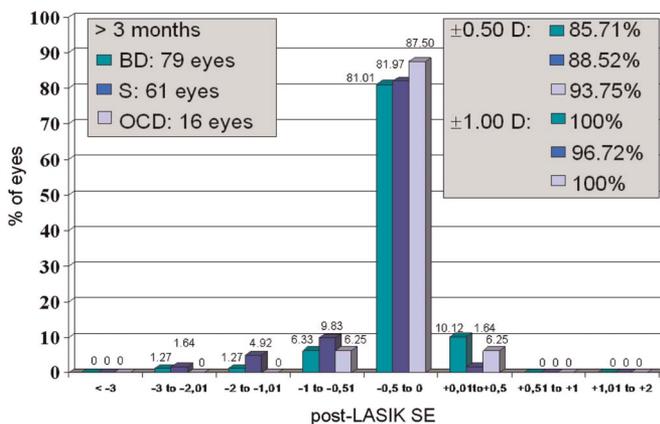


FIGURE 3. SE refractive outcome. BD, bipolar disorder; OCD, obsessive–compulsive disorder; S, schizophrenia.

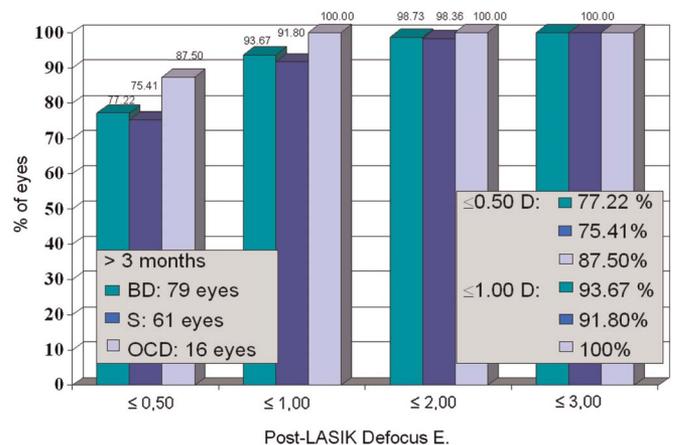


FIGURE 4. Defocus equivalent. BD, bipolar disorder; OCD, obsessive–compulsive disorder; S, schizophrenia.

TABLE 4. Subjective Assessment of Treatment From the Patient's Perspective

	Bipolar Disorder (%)	Schizophrenia (%)	Obsessive-Compulsive Disorder (%)	Total (%)
Patients who completed the survey	34 (80.95)	21 (65.62)	7 (87.5)	62 (75.61)
Patients satisfied with the attention received: number of patients ranking 8/10 or better	29 (85.29)	21 (100)	5 (71.43)	55 (88.71)
Patients satisfied with the result: number of patients ranking 8/10 or better	29 (85.29)	21 (100)	5 (71.43)	55 (88.71)
Treatment has improved the quality of life	33 (97.06)	21 (100)	7 (100)	61 (98.39)
Would undergo surgery again	33 (97.06)	21 (100)	7 (100)	61 (98.39)
Would recommend surgery	33 (97.06)	21 (100)	7 (100)	61 (98.39)
Would recommend the surgical institution	31 (91.18)	20 (95.24)	6 (85.71)	57 (91.94)

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