Outcomes of Laser In Situ Keratomileusis and Photorefractive Keratectomy in Patients Taking Isotretinoin

JULIO ORTEGA-USOBIAGA, FERNANDO LLOVET-OSUNA, MOHAMMAD REZA DJODEYRE, RAFAEL BILBAO-CALABUIG, FÉLIX GONZÁLEZ-LÓPEZ, ANDREA LLOVET-RAUSELL, AND VASYL DRUCHKIV

• PURPOSE: **To determine the functional outcomes of laser in situ keratomileusis (LASIK) and photorefractive keratectomy (PRK) in patients taking isotretinoin, which is contraindicated for these procedures.**

• DESIGN: **Multicenter, retrospective, interventional case series.**

• METHODS: **All patients taking isotretinoin who underwent LASIK or PRK from January 2003 to September 2017 were included (Group 1). Patients were compared with those undergoing LASIK or PRK who had taken isotretinoin previously but not in the previous 6 months (Group 2). Patients were included consecutively.**

• RESULTS: **A total of 113 patients (219 eyes) were included. No significant intraoperative or postoperative complications were found. There were no significant differences between the groups in terms of visual acuity, postoperative spherical equivalent, efficacy index, predictability, or safety index. When only PRK patients were taken into account, the efficacy index ($P = .017$), postoperative sphere ($P = .041$), and postoperative astigmatism ($P < .001$) were better in Group 2, although the difference was not clinically relevant.**

• CONCLUSIONS: **In our experience, LASIK and PRK can be performed effectively and safely in selected patients taking isotretinoin. The absolute exclusion of certain systemic medications should be reconsidered. (Am J Ophthalmol 2018;192:98–103. © 2018 Elsevier Inc. All rights reserved.)**

FOLLOWING THE RECOMMENDATIONS OF THE FIRST excimer laser manufacturers, the United States Food and Drug Administration (FDA) established a group of absolute and relative contraindications for corneal refractive surgery during the early days of photorefractive keratectomy (PRK) and laser in situ keratomileusis (LASIK). Specific systemic medications were included in the list of contraindications. Isotretinoin (13-cis retinoic acid) was one such drug. According to the FDA, isotretinoin is a contraindication for LASIK.

The American Academy of Ophthalmology currently considers the use of isotretinoin to be a relative contraindication for corneal refractive surgery.[1] Furthermore, a recent review on contraindications states that laser refractive surgery should be avoided in patients taking isotretinoin.[2] It is usually advised to stop isotretinoin more than 6 months before performing laser refractive surgery, although the appropriate wait time has not been established.[3] The literature provides no evidence for an association between poor outcome of laser refractive surgery and isotretinoin.[4] Ortega-Usobiaga and associates[5] showed that amiodarone—also contraindicated—was not associated with poor results after LASIK and PRK.

The objective of the present study was to determine the outcomes of a group of patients treated with isotretinoin who underwent LASIK or PRK and whether it is beneficial to wait at least 6 months between stopping isotretinoin and undergoing laser refractive surgery.

METHODS

THIS RETROSPECTIVE CASE SERIES REVIEW COMPRISED PAtients who had undergone LASIK or PRK at Clínica Baviera, Spain, between January 2003 and September 2017. More than 40 000 refractive procedures are performed each year at the clinic, a private ophthalmologic institution with 19 centers and 84 surgeons located throughout Spain. Data collection fulfilled Spanish legal requirements, and institutional review board approval was obtained. Given the retrospective nature of the research design, no informed consent was required.

Patients who were receiving isotretinoin before surgery were identified through an electronic search of medical histories using the key words *LASIK/PRK* and *isotretinoin*. Clinical data files at the institution are computerized and contain a field labeled "indication," which includes the type of surgery each patient underwent. The 2 options available for laser corneal refractive surgery are LASIK and PRK.

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From the Department of Cataract and Refractive Surgery, Clínica Baviera, Bilbao, Spain (J.O.-U.); Department of Cataract and Refractive Surgery, Clínica Baviera, Madrid, Spain (F.L.-O., R.B.-C., F.G.-L.); Department of Cataract and Refractive Surgery, Clínica Baviera, Zaragoza, Spain (M.R.D.); Centro de Oftalmología Barraquer, Barcelona, Spain (A.L.-R.); and Department of Research and Development, Clínica Baviera, Valencia, Spain (V.D.).

Inquiries to Julio Ortega-Usobiaga, Clinica Baviera, Ibáñez de Bilbao, 9, 48009 Bilbao, Spain; e-mail: jortega@clinicabaviera.com

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TABLE 1. Demographics of Corneal Refractive Surgery Patients Taking (Group 1) and Not Taking Isotretinoin (Group 2)

	Group 1	Group 2	*P*
Age (y): median; Q25/Q75 (range)	27; 23/31 (18-52)	27; 25/29 (18-44)	.714[a]
Sex, n (%)			.492[b]
Male	32 (39.02%)	15 (48.39%)	
Female	50 (60.98%)	16 (51.61%)	
Type of surgery, n (%)			.229[b]
LASIK	143 (20.25%)	51 (83.61%)	
PRK	15 (9.49%)	10 (16.39%)	

LASIK = laser in situ keratomileusis; PRK = photorefractive keratectomy; Q = quartile.

[a]Nonparametric Mann-Whitney test.

[b]χ^2 test.

The medical histories were reviewed to collect the following data: age, sex, eye involved, procedure type (LASIK, PRK), and postoperative corrected distance visual acuity (CDVA), postoperative uncorrected distance visual acuity (UDVA), and complications.

The patients were compared with a group of patients from the same period who had been treated with isotretinoin before undergoing LASIK or PRK. These patients had discontinued isotretinoin at least 6 months before surgery.

• **SURGICAL TECHNIQUE AND POSTOPERATIVE PROTOCOL:** Patients had stable refraction for at least 1 year before the procedure. A complete ophthalmologic examination was performed before surgery following a standard protocol to determine whether patients were suitable candidates for corneal refractive surgery. Written informed consent was obtained before surgery in each case. All procedures were performed according to standard protocols. LASIK was

TABLE 2. Preoperative Refractive Data of Corneal Refractive Surgery Patients Taking (Group 1) and Not Taking Isotretinoin (Group 2)

	Group 1 (N = 158 Eyes)		Group 2 (N = 61 Eyes)		
	Range	Distribution	Range	Distribution	*P*
Sphere (D)					
LASIK	-8.81 to +4.75	-3.25 (-4.75/-1.88)	-9.00 to +5.75	-3.50 (-4.75/-2.62)	.309[a]
PRK	-7.00 to -1.75	-2.25 (-4.00/-2.00)	-4.50 to -1.75	-3.50 (-4.00/-2.56)	0.467[a]
Total	-8.81 to +4.75	-3.25 (-4.72/-2.00)	-9.00 to +5.75	-3.50 (-4.50/-2.50)	0.275[a]
Astigmatism (D)					
LASIK	0.00 to -2.75	-0.50 (-1.00/-0.25)	0.00 to -4.50	-0.50 (-1.25/-0.25)	0.698[a]
PRK	0.00 to -1.50	-0.50 (-1.00/-0.38)	-0.50 to -1.75	-0.50 (-0.88/-0.50)	0.794[a]
Total	-0.00 to -2.75	-0.50 (-1.00/-0.25)	0.00 to -4.50	-0.50 (-1.25/-0.25)	0.561[a]
Spherical equivalent (D)					
LASIK	-9.06 to +4.88	-3.50 (-5.00/-2.19)	-9.50 to +4.25	-3.75 (-4.94/-3.00)	0.252[a]
PRK	-7.75 to -1.75	-2.75 (-4.31/-2.24)	-4.88 to -2.00	-3.94 (-4.25/-2.81)	0.374[a]
Total	-9.06 to +4.88	-3.50 (-4.96/-2.23)	-9.50 to +4.25	-3.75 (-4.75/-2.88)	0.202[a]
Mean keratometry (D)					
LASIK	39.75 to 47.50	43.50 ± 1.36	40.25 to 47.25	43.74 ± 1.51	0.289[b]
PRK	40.85 to 47.25	44.75 (41.89/45.02)	41.00 to 44.75	44.50 (43.50/44.75)	0.556[a]
Total	39.75 to 47.50	43.53 ± 1.44	40.25 to 47.25	43.74 ± 1.48	0.334[b]
UDVA (logMAR)					
LASIK	0.00 to 2.00	1.52 (0.70/1.70)	0.05 to 1.70	1.70 (1.00/1.70)	0.021[a]
PRK	0.40 to 2.00	1.00 (0.70/1.30)	1.00 to 1.70	1.70 (1.00/1.70)	0.147[a]
Total	0.00 to 2.00	1.52 (0.70/1.70)	0.05 to 1.70	1.70 (1.00/1.70)	0.006[a]
CDVA (logMAR)					
LASIK	-0.10 to 0.12	0.00 (0.00/0.02)	-0.08 to 0.09	0.00 (0.00/0.01)	0.654[a]
PRK	0.00 to 0.12	0.00 (0.00/0.01)	0.00 to 0.05	0.02 (0.01/0.02)	0.057[a]
Total	-0.10 to 0.12	0.00 (0.00/0.02)	-0.08 to 0.09	0.00 (0.00/0.02)	0.340[a]

CDVA = corrected distance visual acuity; D = diopter; LASIK = laser in situ keratomileusis; PRK = photorefractive keratectomy; UDVA = uncorrected distance visual acuity.

[a]Nonparametric Mann-Whitney test; medians and quartiles are shown under distribution.

[b]*t* test for independent samples; means ± standard deviations are shown under distribution.