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Strabismus correction with refractive surgery: a case report

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Background. *Refractive surgery is an alternative treatment for the correction of strabismus associated with ametropia in adults.*
Purpose. *To report a case of a young adult patient with exodeviation and uncorrected myopia in childhood who came to a consultation to improve her visual and aesthetic quality.*
Material and Methods. *Preoperatively, the uncorrected visual acuity of 20/400 was presented in both eyes with compound myopic astigmatism that, with correction, improved to 20/30. In addition, in both eyes the patients presented exotropia of 40º that increased to 60º.*
Results. *Photorefractive keratectomy surgery was performed in both eyes, achieving an uncorrected visual acuity of 20/20, and orthotropia was maintained until the consultation six months after the operation.*
Conclusion. *Refractive surgery can be performed successfully in patients with accommodative or non-accommodative strabismus. Each patient must be studied to define whether or not they are suitable for this type of surgery.*

Key words:
strabismus, exotropia, PRK, refractive surgery

Introduction. Refractive surgery is a new treatment option in some patients with strabismus. Myopic or hyperopic patients with accommodative strabismus can benefit from this surgery by eliminating these deviations and improving their vision.

Accommodative esotropia is common in patients with hyperopia, as is exotropia in myopic patients. In both cases, patients try to accommodate excessively in an attempt to improve the image they see. Strabismus becomes visible in these adults. In this way, refractive surgery is an ideal treatment because it allows you to correct your refractive defect and strabismus in a single surgery.[1]

To perform surgery in these patients with strabismus, each patient must be studied to define whether or not they are suitable for this type of surgery. The preoperative assessment of refractive surgery in a patient with strabismus varies from that of a normal patient. It is necessary to inquire if there is a history of using of eye patches, the performance of accommodation exercises, strabismus surgery in childhood, or episodes of diplopia. Ocular motility should be carefully evaluated using cover tests with and without optical correction, with near and distance vision. [2]

Despite excellent results, the effect of refractive surgery on ocular alignment is controversial.[3]

Case report

This was a 34-year-old female patient, with no significant history, who reported that she had strabismus from the birth. And she came due to poor vision and deviation. The patient had never used optical correction in the past, she lived with poor visual acuity all the time.

The ophthalmological physical examination found: Visual acuity of the right eye of 20/400 that improves to 20/70 with pinhole, the left eye 20/200 that improves to 20/70 with pinhole. Color vision measured with the Ishihara Test was normal for both eyes. Anterior segment with transparent cornea formed anterior chamber, wide, normorreflectic pupil and transparent lens in both eyes. Intraocular pressure right eye was 13 mm Hg, in the left eye was 14 mm Hg.

Right eye fundus: papilla was with well-defined borders, normal vessel emergence, excavation of 3-tenths of a disc. The left eye had the same characteristics.

At refraction we found the right eye -2.00 = -5.00 x 167º, the left eye +0.25 = -4.50 x 13º, improving the right eye to 20/30, left eye 20/30, without improving strabismus with aerial lenses.

Eye movements: exotropia of 40 prismatic diopters that increased to 60 with half an hour of constant monocular occlusion with patch, with alternation. Asymmetric X syndrome, opened more in infra than in supraversion, with hyperfunction + of the 4 oblique muscles. AC/A of 2.5/1.

It was decided to paralyze the accommodation with cyclopentolate to perform cycloplegic refraction and, surprisingly, complete correction of the deviation was observed, eyes in orthoposition, with large exophoria to the screen.

Refraction was performed under cycloplegia and the following was observed: the right eye -1.50 = -5.00 x 170º, the left eye +0.75 = -4.50 x 10, for which wat is decided to perform photorefractive surgery with excimer laser of both

Fig. 1. Presurgical appearance of the patient.

Fig. 2. Post-surgical appearance of the patient.

eyes (PRK), slightly hypercorrect to leave low hyperopia that induces accommodation and thus correct the constant exotropia due to decompensation of the exophoria

Refractive photorefractive keratectomy surgery was performed and the patient presented orthoposition, leaving the right eye with hyperopia of +0.75 sph and the left eye of +0.50 sph. This result was maintained 6 months after the operation.

It only presents exophoria to the monocular and alternate screen maneuver (single and alternate cover test). It should be noted that it never decompensates spontaneously, despite the great magnitude of the latent exodeviation, it does not behave as an intermittent exotropia, but rather as an exophoria at all times. Before the surgery, as it was a tropia, the stereopsis had not been measured, after the operation it was measured with Random dot. and manifested 60 ”of arc, excellent. For fusion we use the Worth test. Retinal correspondence was normal. (PIC1, PIC2).

Discussion

What is striking in this case is the very early onset of the deviation, according to the patient's parents, and yet it maintained the capacity for fusion and stereopsis, the fact that it was always constant. Apparently, they do not report that it has had a period of intermittence, yes, with alternation.

Photorefractive keratectomy (PRK) can be safely performed in amblyopic children and achieves excellent results in uncorrected visual acuity and stereopsy. This represents an effective alternative in for children who do not comply with traditional treatments for amblyopia. In a study on PRK in amblyopic children they included a group of them in which there was strabismus, since in these, a satisfactory and functional result was achieved in 63% of them. In all of them, the stereopsy was maintained or there was an improvement, including one patient who did not have stereopsy before the procedure and then reached up to 60 arc minutes.[4]

The great magnitude of the exodeviation explains why it was constant. However, just by performing cycloplegia, the patient managed to be in orthoposition all the time, incredibly because by paralyzing her accommodation when she tried to exercise it unsuccessfully, she hyperconverged and stayed aligned. For this reason, it was decided to operate the refractive defect first and see how the strabismus behaved, to operate it in a second stage if necessary. However after the operation, the patient does not report fatigue or effort and is aligned all the time, and with stereopsis, which indicates that it is not exerting some kind of voluntary convergence, but that the alignment depends on its highly efficient fusional mechanisms. The latent deviation is huge, but compensated.

He refers to an article that reports the results of LASIK refractive surgery in 18 adult patients with hyperopia and accommodative esotropia. At 20 months of follow-up, all patients were kept in orthotropia and without the need for optical correction.

A retrospective study evaluated the outcome in 40 patients aged between 17 and 39 who underwent PRK surgery for accommodative esotropia in whom orthotropia was maintained until the end of follow-up.

Refractive surgery has also been used successfully in patients with myopia and exodeviations, a study reports that of 12 adult patients with myopia and exodeviation who underwent refractive surgery, 6 achieved a reduction in the angle of deviation. Most of those who did not improve had associated vertical deviations and other ocular pathologies.[1]

It must be assumed that the onset was not as early as the patient and her parents report, and that, at least initially, it was intermittent, developed fusion and stereopsis, and then the poor vision caused the fusion to stop and the deviation to become constant. However it is very rare that many years later, just by improving visual acuity with refractive surgery, he maintains such good deviation control and has such good stereopsis.

It can be assumed that with the passage of time the exophoria could turn into an intermittent exotropia, but as long as this is not manifested, it will not require strabismus surgery.

Kirwan conducted a study that included 28 patients, 16 with esotropia and 12 with exotropia. None of these patients had deviation decompensation or diplopia. All improved their ocular alignment, wich was more noticeable in those with accommodative partial esotropias and in myopic ones with exotropias. These patients with exotropia in the preoperative period had a deviation range from 10 PD to 40 PD. Two patients with exophoria stand out and a history of strabismus surgery in children in whom a reduction in exophoria was obtained.[2]

A study reports that PRK is an effective treatment in the correction of strabismus associated with refractive disorders, after operating 27 young adult patients.[3]

The type of laser procedure is a factor to consider. Surface lasers such as LASEK and PRK are reported to be used less frequently in the treatment of hyperopia. Several studies report excellent results in patients with farsightedness up to 5.0 D. They state that operated patients with farsightedness greater than 5.0 D carry a greater risk of regression of the defect and less predictable refractive results. Some studies report a high rate of retreatments in patients operated up to 8.5 D. [2]

The correction of strabismus through refractive surgery in children and adolescents is not yet widely reported; its use is more widespread in adults. He refers that more studies are required to determine the role of refractive surgery in treating strabismus in children.[5] One study refers to a 7-year-old boy with myopia and exotropia in both eyes, refractive surgery in both eyes. The exotropia of 60 DP was reduced to 40 DP and the visual acuity of 20/200 improved to 20/100. Next, strabismus surgery was performed and two months after both surgeries the patient remained in orthotropia.[3]

There are risks of refractive surgery in patients with strabismus such as decompensation of strabismus and the appearance of diplopia. It leads to patient dissatisfaction. [5] Studies with significant results of decompensation of pre-existing exodeviations and loss of binocular function are also reported when patients with high myopia are included.[3]

Patients must be correctly informed that there will not be a worsening of their ocular deviation, but that there is a possible risk of overt postoperative decompensation, especially in patients with intermittent or latent deviation.[6]

Conclusion

Intermittent or manifest strabismus is not a contraindication for refractive surgery, only a warning for a complete orthoptic examination at the preoperative consultation. Refractive surgery can be performed successfully in patients with strabismus and ametropia, allowing them better vision and aesthetics in a single procedure.

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Disclosures

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