Non-organic Visual Loss in Patients with Multifocal Intraocular Lenses

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Purpose: To report non-organic visual loss (NOVL) following cataract surgery with multifocal intraocular lens (IOL) implantation.

Methods: After reviewing consecutive cases of NOVL diagnosed by a single neuro-ophthalmologist over a one year period, two patients reported herein attributed their visual symptoms to cataract surgery and multifocal IOL implantation.

Results: In both patients variability was noted in visual function and kinetic perimetry demonstrated non-organic visual field loss. Initially, refractive surgeons considered lens exchange, which was avoided after neuro-ophthalmic evaluation in both cases.

Conclusions: This report should alert cataract and refractive surgeons to the possibility of NOVL as an explanation for dissatisfaction after cataract surgery with multifocal IOL implantation.

Keywords: Multifocal Intraocular Lens; Non-organic Visual Loss; Visual Field Defect; Kinetic Perimetry

INTRODUCTION

The development of multifocal intraocular lenses (IOLs) has enabled some patients to achieve excellent visual acuity at multiple focal points after cataract surgery. Generally, patients have been satisfied with these lenses, however visual complaints have also been noted and broadly classified as those due to blurred vision and photic phenomena.1-4

Non-organic visual loss (NOVL) is a common problem in neuro-ophthalmic practice.5 This spectrum of conditions includes patients with complaints of decreased visual acuity, visual field constriction and double vision. Visual field constriction has been the most common manifestation reported by some practitioners.6

I studied a series of patients with NOVL and noted that cataract surgery was attributed as the precipitating event for visual loss in two patients; implantation of a multifocal lens, an AcrySof ReSTOR (Alcon Laboratories, Fort Worth, Texas, USA) lens, was thought to be the reason for decreased vision in both patients. This report highlights the visual complaints of patients with NOVL which were ascribed to implantation of multifocal IOLs. These complaints prompted consideration of IOL exchange despite the fact that the IOLs were well-positioned in both cases.

METHODS

After Institutional Review Board (IRB) approval, records of all newly diagnosed patients with NOVL from January 1, 2010 through December 31, 2010 were reviewed. Thirty-four consecutive new cases of NOVL were visited during this period by a single neuro-ophthalmologist. The diagnosis of NOVL was confirmed by demonstrating that visual function was better
than what the patient claimed and that the results of examinations were not consistent with the declared level of visual function. Follow-up duration was variable, however neither patient developed any organic cause of visual loss accounting for the symptoms at any follow-up visit over a one-year period.

RESULTS

Of 34 patients with NOVL, 27 (79%) were female and nine had history of prior ocular surgery; two had undergone strabismus surgery 8 and 20 years prior to the claimed visual loss, one had radial keratotomy 16 years earlier and one received corneal transplantation one year earlier, five other patients had history of cataract surgery 3, 4 and 6 years before referral. None of the seven patients described above related the onset of their visual problems to prior ocular surgery.

Two patients had cataract surgery which was temporally related to complaints of decreased vision; both subjects were female and had undergone cataract surgery with implantation of an AcrySof ReSTOR (Alcon Laboratories, Fort Worth, Texas, USA) lens in each eye.

Patient 1

A 73-year-old woman underwent sequential cataract surgery in February and March 2010 in her left and right eyes with implantation of AcrySof ReSTOR (Alcon Laboratories, Fort Worth, Texas, USA) IOLs in both eyes. Following surgery on the right eye, she noted a “veil” obscuring vision in both eyes. On return to her surgeon, no problems were noted regarding the position of the multifocal IOLs. She consulted three additional refractive surgeons and two of them raised the possibility of IOL exchange.

Due to a prior complaint of dizziness in February 2008, she underwent MRI of the brain, head and neck, all of which were normal.

Neuro-ophthalmic examination in November 2010 revealed uncorrected visual acuity of 20/40 and 20/50 in her right and left eyes by a technician. When the test was repeated by a neuro-ophthalmologist 15 minutes later, uncorrected visual acuity was 20/20 at distance and J1 at near, bilaterally. She was able to identify 10 of 10 Ishihara pseudoisochromatic color plates with each eye and both pupils were brisk without a relative afferent pupillary defect. Confrontation visual fields were full bilaterally, however automated perimetry demonstrated superior arcuate defects with a large number of false negative errors in both eyes (Fig. 1, upper image). Kinetic perimetry was performed as previously described and revealed a target pattern with variability of responses and overlapping isopters in both eyes (Fig. 1, lower image); all findings were consistent with NOVL. Ocular motility was normal and the patient was orthotropic in primary position with alternate cover testing. Slit lamp examination showed well-positioned posterior chamber multifocal IOLs in both eyes. Funduscopy was normal with a cup/disc ratio of 0.4, bilaterally. Additionally, full field electroretinography and visual evoked responses were normal on both sides.

Patient 2

A 63-year-old woman underwent sequential cataract surgery in July and September 2010 in the right and left eyes respectively. She too received AcrySof ReSTOR (Alcon Laboratories, Fort Worth, Texas, USA) IOLs in both eyes. Following cataract surgery in the second eye she complained of decreased vision in both eyes. She revisited her surgeon and also consulted a retina specialist who noted no abnormalities to explain her complaints. Her surgeon suggested that she could have the multifocal IOLs exchanged and replaced by single focal lenses. Another refractive surgeon, whom she visited later, also brought up the possibility of IOL exchange.

Neuro-ophthalmic examination in December 2010 revealed bilateral uncorrected visual acuity of 20/200 when the technician tested her; 30 minutes later, when she was re-evaluated by a neuro-ophthalmologist, uncorrected visual acuity was 20/30 in both eyes. Color vision was 2/10 Ishihara pseudoisochromatic color plates on each side but on repetition 30 minutes later, it was found to be 5/10 and 8/10 in her right and left eyes, respectively. Confrontation visual fields
were full on both sides, nevertheless automated perimetry (Fig. 2, upper image) showed diffuse constriction with a large number of false negative errors in both eyes. Kinetic perimetry (Fig. 2, lower image) revealed a target pattern with variability of responses and overlapping isopters in both eyes, findings consistent with NOVL. Ocular motility was normal and she was orthotropic in primary position with alternate cover testing. Slit lamp examination revealed well-positioned posterior chamber multifocal lenses in both eyes. Funduscopy was normal on both sides with a cup/disc ratio of 0.1, bilaterally.

DISCUSSION

Multifocal IOLs have broadened refractive options for improving uncorrected visual acuity in patients undergoing cataract surgery. While many patients are pleased with the results, dissatisfaction with multifocal lenses has also been noted. Blurred vision has been the most
common cause of this displeasure which may as well be due to residual ametropia, posterior capsular opacification, astigmatism, pupil abnormalities, IOL decentration and dry eye syndrome.

The authors of one series created an algorithm for evaluating patients suffering from blurred vision or photic phenomena after multifocal IOL implantation; in this algorithm the possibility of NOVL was not included. In another series of 49 patients undergoing implantation of a multifocal IOL, the cause of persistently blurred vision was not identified in one patient. The specifics of the examination findings in this patient were not mentioned and the patient refused further management; non-organic visual loss was not considered in this report.

While most dissatisfied patients with multifocal IOLs can be managed conservatively, IOL exchange may become necessary, the rate of which has been reported to vary from 4 to 7%.

In the current consecutive series of patients with NOVL, 9 had prior history of ocular surgery; in 7 cases the surgery had been a remote
event from the onset of visual symptoms and therefore the operation was not attributed as a cause of visual loss. Two patients temporally associated their symptoms with cataract surgery and implantation of multifocal IOLs. I am not aware of any other report describing patients with NOVL who associated their symptoms to implantation of a multifocal lens.

There are already a number of techniques designed to support a diagnosis of NOVL; for instance spiral and star-shaped visual fields which are thought to occur due to rapid fatigability and are best demonstrated using kinetic perimetry. The “tubular field” pattern is another useful method in which the visual field is the same size despite varying the distance between the subject and the examiner, and can be documented with confrontation techniques or using a tangent screen. Finally, the repeat III4e isopter method which can demonstrate a target shaped visual field graphically documents concentric contraction of the visual field. In contrast to the tubular field, the repeat III4e isopter method does not depend on patients’ failure to recognize that the visual field should expand with increased testing distance. Furthermore, this method does not require additional devices and can be readily applied in clinics already equipped with kinetic perimetry.

In my experience, the most common type of NOVL is peripheral constriction, similar to what was observed in both cases of this report. Both patients in the current study underwent kinetic perimetry employing the target visual field method which demonstrated variable and non-physiologic responses, a method that we have already shown to be effective for documenting NOVL.

The importance of demonstrating the non-organic basis of symptoms in these patients is underscored by prior reports on dissatisfaction after multifocal IOL implantation. It has been suggested that many patients who are dissatisfied with multifocal IOLs can be effectively treated with laser capsulotomy or refractive surgery, and that some may require lens repositioning or exchange. IOL exchange was considered for both of the patients reported herein prior to neuro-ophthalmic examination.

The more widespread and frequent use of multifocal IOLs are likely to increase the number of patients who become dissatisfied after cataract surgery. Adding NOVL to the algorithm of evaluation in these patients may help avert unnecessary interventions.

Conflicts of Interest
None.

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