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Sensory exotropia subsequent to senile cataract

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Abstract: To evaluate the phacoemulsification and intraocular lens implantation in patients with sensory exotropia subsequent to senile cataract. The authors prospectively studied the role of phacoemulsification and intraocular lens implantation on 25 patients by observing visual acuity, ocular alignment, binocular vision and diplopia pre-, 1 month post- and 3 months post-operation. The patients underwent follow-up for three months. Postoperatively, one patient had a corrected visual acuity of 20/50, and 24 patients had 20/40 or better. The ocular alignment, binocular vision and diplopia were resolved spontaneously. Phacoemulsification and intraocular lens implantation performed together is effective on sensory exotropia subsequent to senile cataract.

Key words: Phacoemulsification, Senile cataract, Sensory exotropia
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INTRODUCTION

Sensory exotropia is a condition of unilateral divergence as a sequela to loss of vision or long-standing poor vision in one eye, which was caused by refractive errors, unilateral aphakia or other organic reasons. Convergence insufficiency or disruption is possible. The most important aspect of the management is to find and/or eliminate and/or reverse a treatable cause of the exotropia. In clinic, the sensory exotropia secondary to senile cataract was often observed. Prospectively, we examined the patients of sensory exotropia subsequent to senile cataract, who underwent phacoemulsification and intraocular lens implantation, and studied the changes of ocular alignment and binocular vision in these eyes.

MATERIALS AND METHODS

This study included patients >55 years with senile cataract who underwent surgery in our hospital between January 2002 and October 2004. Patients with hyperthyroidism, diabetic mellitus or history of brain trauma were excluded. Patients with a history of exotropia and amblyopia, ocular trauma and previous ocular surgery were also excluded. All the patients were not associated with sensory obstacles such as glaucoma, high myopia, uveitis or other fundus diseases.

Each patient was subjected to a complete physical and ophthalmologic evaluation. Examinations included determination of corrected visual acuity using illiterate E charts, ocular alignment by prism bar cover test, binocular vision test by synoptophore, thorough ocular motility, diplopia of the dominant eye were conducted before, and 1 month and 3 months after the surgery. Slit lamp examination of the anterior segment and indirect ophthalmoscopic examination of the fundus were conducted. Intraocular pressure, binocular A- and B-ultrasonography, corneal curvature were examined and visual electrophysiological test was recommended and some patients agreed. Special emphasis was paid to the cataract type and the duration of significant visual loss as experienced by the patients.

Under peribulbar and superficial anesthesia, a clear corneal incision, about 3.0 mm×2.0 mm in size,

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was formed using a diamond blade at temporal lateral. With viscoelastic filled in the anterior chamber and after continuous curvilinear capsulorhexis, hydrodissection and hydrodelineation were performed. The surgeon performed singlehanded phacoemulsification using appropriate nucleofractis method such as divide and conquer phaco chop, or quick chop. The remaining lens cortex was aspirated by vitrector. Once the capsular bag was empty and viscoelastic was injected into both the anterior chamber and capsular bag, a foldable intraocular lens was implanted with an injector into the capsular bag. Clearing viscoelastic and shrinking pupil, the corneal incision self-sealed. A subconjunctival injection of 20 mg gentamycin and 2 mg dexamethasone was given at the end of the procedure. Postoperatively, patients were treated with peroral dexamethasone and topical steroid-antibiotic drops.

RESULTS

Twenty-five patients (9 men and 16 women) diagnosed with sensory exotropia subsequent to senile cataract comprised the study population. The mean age of these patients was 69.1±9.8 years. There were 14 right eyes and 11 left eyes operated on. The mean duration of decrease in vision was 24.6±8.7 months. No patient knew the exact time when the exotropia occurred.

Preoperatively, all patients had corrected visual acuity from LP to 20/100, and in the opposite eye from 20/40 to 20/20. Fourteen patients had nuclear cataract varying from III and IV degrees; 6 patients had posterior capsular cataract; 3 patients had white lens; and 2 patients had cortex cataract. Binocular A-scan, B-scan and corneal curvature examination revealed no abnormalities. All patients had exotropia (Table 1), but did not show dissociated vertical deviation or primary vertical deviation in straight gaze. Except that 2 patients had first level of binocular vision, others lost binocular vision. Eleven right eyes and 14 left eyes were dominant eyes. All patients had no diplopia with normal ocular motility.

No complications occurred during the operations. Postoperatively, 6 patients had slightly cloudy cornea in 1 week; all had light degree of inflammatory reaction in the anterior chamber but the inflammation disappeared after 1 month.

During 3-month follow-up, 1 patient had corrected visual acuity of 20/50 in the first month and 8 patients had visual acuity of 20/40, 6 patients had visual acuity of 20/30, 10 patients had visual acuity of 20/25. The ocular alignment changes are listed in Table 1. One month after the operation, 1 patient had first level of binocular vision, 13 had second level, and 11 had third level; 3 months after the operation, 11 had second level and 14 had third level. One month after the operation, 12 right eyes and 13 left eyes were dominant eyes; at the end of the third month after the operation, the situation was not changed. One day after the operation, 10 patients had diplopia; 1 month later, 8 patients had diplopia; on the third month, all the diplopia disappeared. The ocular mobility was normal in all the patients postoperatively.

DISCUSSION

Magramm and Schlossman (1991) studied strabismus in patients over 60 years and found sensory deviation in 16% cases. Sharkey and Sellar (1994) studied three adult patients with dense cataract and exotropia. All had persistent diplopia after cataract surgery due to central fusion disruption. Two of these patients underwent strabismus surgery.

Diplopia has no single cause; rather, a variety of different causes accounts for these distressing strabismic problems. For one causative reason, some patients may have previously unrecognized strabismic conditions that became manifest following visual acuity improvement, e.g., patients with thyroid ophthalmopathy, especially those who had restrictive ophthalmopathy but no exophthalmos or inflammatory

Table 1 Changes of the ocular alignment pre- and post-operation (prism diopter Δ)

	Right focus (5 m)	Left focus (5 m)	Right focus (33 m)	Left focus (33 m)
Pre-operation (n=25)	−13.8±4.7	−13.1±7.1	−4.2±4.8	−4.9±5.6
One month post-operation (n=25)	−5.8±4.6	−5.9±4.5	−1.3±2.7	−1.3±2.7
Three months post-operation (n=23)	−3.7±2.4	−3.9±2.4	−0.6±1.3	−0.6±1.3

signs. These patients might have been controlling a slowly developing diplopia that became manifest following cataract surgery. Similarly, patients with long-standing and well-compensated superior oblique palsies may not notice diplopia prior to unilateral cataract extraction because of poor vision in one eye. Following successful surgery, an intermittent or constant diplopia may be noted. For another reason, the direct surgical trauma to the extraocular muscles and tissues by bridle sutures may be causative factor, or myotoxic effects of administered local anesthetic agents induced the diplopia. And causative factor may be anisometropia or aberration. A fourth cause is that a cataract disrupted binocular vision and induced the sensory deviation, which was the pathogenic factor of our study.

Chaudhuri and Pandey (2000) found that the duration of decrease in visual acuity was probably an important factor that may lead to persistent postoperative diplopia. The direction and the degrees of deviation and type of the cataract did not seem to affect the surgical outcomes. In their study, most patients showing sensory exotropia subsequent to senile cataract will not experience postoperative diplopia and will achieve spontaneous ocular realignment with good fusional amplitudes and stereoacuity at the end of 3 months.

In the present study, the incidence rate of postoperative diplopia was 40%. All the patients did not present diplopia, achieved spontaneous ocular realignment and varying degrees of binocular vision recovery at the end of 3 months. Therefore, phacoemulsification and intraocular lens implantation performed together could be recognized as effective on sensory exotropia subsequent to senile cataract. Nevertheless, the diagnosis of the etiologies of exotropia preoperatively must be a very important cause of the different etiology leading to different prognosis, as Hamed (1991) noted that strabismus presenting after cataract surgery could be long-lasting.

Although, most patients with manifest sensory exotropia subsequent to senile cataract will not experience postoperative diplopia while some other patients will spontaneously recover in 1~3 months postoperatively. The patients should be informed of the possibility of diplopia and the subsequent possible need for corrective strabismus surgery before consenting to cataract surgery. In addition, patients with long-standing unilateral cataracts may be uniquely at risk for postoperative intractable diplopia caused by permanent disruption of central fusion.

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