

# Combined strabismus and phacoemulsification cataract surgery: a useful option in selected patients

DAVID SQUIRRELL, MATTHEW EDWARDS  
JOHN BURKE

## Abstract

**Purpose** To evaluate the role of combined strabismus and phacoemulsification cataract extraction in patients with symptomatic cataract and strabismus.

**Methods** Four procedures of combined strabismus and cataract surgery are described in 3 elderly patients with strabismus of differing aetiologies. Two patients underwent one procedure; the other patient underwent two combined procedures, one to each eye.

**Results** The visual acuity improved in all 3 patients. Post-operative alignment of the visual axis was achieved which allowed resolution of symptomatic diplopia in patient 1, functional binocular single vision in patient 2 and a noticeably reduced compensatory head posture in patient 3.

**Conclusions** Combined strabismus and cataract surgery is a safe procedure that can optimise visual alignment and improve visual acuity with a minimum number of operations.

**Key words** Cataract, Fallen eye syndrome, Phacoemulsification, Strabismus, Thyroid eye disease

We describe four procedures of combined strabismus and phacoemulsification cataract surgery in 3 patients with strabismus of differing aetiologies. We outline each case and then discuss the possible role that combined strabismus and cataract surgery may have in the management of patients with symptomatic cataract and strabismus.

## Case reports

### Case 1

A 79-year-old woman with chronic inactive thyroid eye disease presented with a stable convergent squint, intractable diplopia and decreasing vision. She had a long-standing corneal opacity in her right eye following herpes zoster keratitis and had recently been

diagnosed with bilateral cataracts. On examination her visual acuity was 6/60 right eye and 6/12 left eye. An alternate prism cover test revealed a right esotropia which measured 55<sup>Δ</sup> at 6 m and 65<sup>Δ</sup> at 1/3 m with a right hypotropia of 6<sup>Δ</sup> in the primary position. Examination of her ductions and versions revealed a marked limitation of both upgaze (ductions measured -3 in both eyes<sup>1</sup>) and abduction (ductions measured -4 right eye, and -3 left eye). Her horizontal versions were so restricted that it was not possible for either eye to remain centred comfortably in the primary position.

She was listed for combined squint and cataract surgery to the right eye under general anaesthesia. Dissection exposed a mechanically contracted medial rectus, which was recessed to 11.5 mm from the limbus by way of fixed sutures. This served to bring the eye to the midline and allowed phacoemulsification cataract surgery with insertion of a posterior chamber intraocular lens (PCIOL) to be performed. Post-operatively the vision in the patient's right eye improved to 6/18 and the deviation for near was slightly improved, measuring 55<sup>Δ</sup> esotropia. The deviation for distance, however, remained unchanged.

Over the ensuing 6 months the lens opacity in her left eye progressed, causing the vision to deteriorate to 6/18. As the patient still had a symptomatic large-angle convergent squint she was listed for further surgery to both eyes. The right medial rectus was re-explored and, based on per-operative forced duction tests, recessed to 16.5 mm from the limbus using fixed sutures. The left medial rectus was recessed to 13 mm from the limbus using fixed sutures. The latter centralised the left eye allowing a phacoemulsification lens extraction with PCIOL insertion.

Four months following surgery the patient's vision had improved to 6/18 right eye, 6/9 left eye and her diplopia had resolved. On alternate prism cover test her esodeviation now

D. Squirrel  
M. Edwards  
J. Burke  
Department of  
Ophthalmology  
Royal Hallamshire Hospital  
Sheffield, UK

J.P. Burke ✉  
Department of  
Ophthalmology  
Royal Hallamshire Hospital  
Glossop Road  
Sheffield S10 2RX, UK  
Tel: +44 (0)114 2712036  
e-mail:  
julie.d.taylor@sth.nhs.uk

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measured 15<sup>Δ</sup> at 6 m and 12<sup>Δ</sup> at 1/3 m; the vertical deviation had reduced to a 2<sup>Δ</sup> hypophoria in the primary position. The final outcome of her two combined strabismus and cataract procedures was improved visual acuity, relief of diplopia and a cosmetically acceptable squint.

### Case 2

An 89-year-old hypertensive man with a long-standing acquired fourth nerve palsy was referred with a recent history of intractable vertical diplopia. His vertical diplopia had been satisfactorily controlled with prisms until he had developed a cataract in his dominant right eye. The loss of vision in his right eye forced him to fixate with his paretic left eye leading to an increase in the vertical deviation that he could no longer control. At presentation his visual acuities measured 6/18 right eye, 6/12 left eye. An alternate prism cover test measured a 14<sup>Δ</sup> right hypotropia in the primary position which increased to 30<sup>Δ</sup> right hypotropia in right gaze but decreased to 7<sup>Δ</sup> right hypotropia in left gaze. The diagnosis was therefore a right fallen eye syndrome secondary to left fourth nerve paresis, and the patient fixed with the paretic left eye.

The patient underwent a combined left inferior oblique myectomy and right phacoemulsification cataract surgery with PCIOL under general anaesthesia. Four months after surgery his visual acuity measured 6/9 right eye and 6/12 left eye and he was once again fixing with his right eye. A prism cover test in the primary position revealed that the horizontal and vertical deviations had been reduced to a 6<sup>Δ</sup> esophoria and a 2<sup>Δ</sup> left hyperphoria which he could control in all positions of gaze. The final outcome of his combined surgery was improved visual acuity, restoration of stereopsis and a large functional field of binocular single vision.

### Case 3

A 78-year-old man with an orbital fibrosis syndrome and mechanically restricted eye movements was referred with decreased vision in his previously dominant left eye and intractable diplopia. His past medical history included epilepsy, diabetes mellitus and ischaemic heart disease. His visual acuity at presentation was 6/9 right eye, 6/36 left eye. His previously best corrected visual acuity was 6/9 RE, 6/18 LE. A prism cover test in the primary position revealed a 50<sup>Δ</sup> exotropia for both near and distance and a left hypotropia which in the primary position measured 30<sup>Δ</sup>. Ocular movements revealed a marked limitation of adduction in both eyes; the duction in the left eye measured -3 and that in the right eye measured -2. There was also a marked limitation of upgaze, the patient being unable to elevate either eye to the primary position (ductions in upgaze measured -4 RE and -6 LE), necessitating the use of a compensatory chin-up head posture.

On the basis of the pre-operative deviation and per-operative forced duction tests the patient underwent a 7 mm left inferior rectus recession and recession of the left lateral rectus to 20 mm from the limbus under general anaesthesia using fixed sutures. These supramaximal recessions centred the left eye which allowed phacoemulsification cataract surgery with PCIOL to be performed. Following surgery the visual acuity in his left eye improved to 6/12 and the horizontal and vertical deviations were reduced to 20<sup>Δ</sup> left exotropia and 4<sup>Δ</sup> left hypertropia respectively. The final post-operative ductions of the left eye after these supramaximal recessions were: adduction -2, abduction -1/2, elevation -4 and downgaze -2. The improvement in his vertical and, to a lesser extent, horizontal alignment was sufficient to eliminate the compensatory head posture and subjectively expand his visual field. It also led to marked cosmetic improvement in his squint.

### Discussion

Cataract and strabismus are amongst the commonest pathologies that are encountered by ophthalmologists. However, whilst the potential benefits of combined surgery for vitreoretinal and cataract,<sup>2</sup> and glaucoma and cataract<sup>3</sup> pathologies are well documented, there are very few reports of cataract and strabismus surgery being performed as a combined procedure.<sup>4,5</sup>

Combined cataract and strabismus surgery was first described by Maltzman *et al.*<sup>4</sup> They presented a series of 10 patients with large-angle, concomitant exotropia and cataract who underwent combined horizontal strabismus and extracapsular cataract surgery. Their results prompted them to conclude that combined surgery in large-angle exotropias was a safe procedure which had the benefit of allowing the patient earlier visual rehabilitation than otherwise would have occurred. The only other report of combined cataract and strabismus surgery comes from a series in which the authors published the outcome of a variety of combined procedures in a largely paediatric population.<sup>5</sup> In all, 10 cases of combined cataract and strabismus surgery were reported, but in 9 of these cases the patient was under the age of 14 years and had a very poor visual prognosis on account of either a congenital anomaly or trauma. Only one of the 10 patients described was an adult with any realistic prospect of visual recovery. Unfortunately this case was not described in detail and although the visual acuity was restored in the operated eye no mention was made as to what impact the strabismus surgery had on the patient's squint.

We describe four procedures where we combined strabismus and phacoemulsification cataract surgery in 3 patients with squints of differing aetiologies. In all cases we improved the visual acuity in the operated eye, achieving a post-operative alignment of the visual axis that allowed resolution of symptomatic diplopia in patient 1, functional binocular single vision in patient 2, and a noticeably reduced compensatory head posture in patient 3. A marked cosmetic improvement in the squint

was achieved in all 3 cases. Ours is the first report of phacoemulsification cataract surgery being combined with strabismus surgery, and is the first report of cataract surgery being combined in patients with significant innervational or mechanical strabismus. We and others have demonstrated that, in the hands of an experienced strabismus and cataract surgeon, the procedure is effective at optimising eye alignment and improving visual acuity with a minimum number of operations. Indications for combined surgery in patients with cataract and strabismus would include: (1) optimising visual acuity, motor fusion and binocular single vision in patients with symptomatic cataract and diplopia; (2) aligning a mechanically deviated eye with good visual potential to facilitate small-incision cataract surgery; (3) reducing the number of operations required by high-risk or elderly patients.

Combined cataract and squint surgery is an option in selected patients with symptomatic cataract and strabismus. The evolution of small-incision cataract surgery and modern strabismus techniques now allows the two procedures to be combined safely and effectively.

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