

# Cataract treatment for elderly patients

The surgical treatment of cataract has seen great advances over the past decade, revolutionising the delivery of care to patients with this condition. The prevalence of cataract is greatest among the elderly and they have much to gain from these developments. **Drs Nicholas Wride** and **David Allen** discuss some of the issues surrounding the treatment of elderly patients with cataract in the UK.

**A**ge-related cataract is the single most important cause of reversible visual impairment. It has been estimated that about half of all patients in their seventies will have a significant cataract and by their nineties, almost everyone will be affected<sup>1</sup>. One of the consequences, therefore, of the demographic shift towards old age that we are witnessing in the population of the Western world is an increase in the amount of cataract. The only effective treatment for cataract remains surgical and involves the removal of opacified crystalline lens fibres and replacement with an artificial intraocular lens, if at all possible.

Cataract surgery is already the most common surgical procedure carried out in the developed world, with over 300,000 operations performed by the NHS alone in the year 2005–2006<sup>2</sup>. This number is set to increase in the future with a greater recognition of unmet need and escalating patient expectation as surgical techniques improve. This presents a challenge to both healthcare professionals to deliver high quality care, and to healthcare policy decision-makers who must target limited resources to maximum benefit.

## Visual impairment in the elderly

The intact visual system is an important sense, enhancing the quality of life of the elderly and impacting significantly on morbidity. The increase of visual impairment with age is associated with a reduced functional status and well-being with a magnitude comparable to major medical conditions<sup>3</sup>. Its effects on nursing home placements<sup>4</sup>, increased

use of community support services<sup>5</sup> and mortality<sup>6</sup> have been well documented.

## Cataract formation

Anatomical changes of the crystalline lens occur throughout life with a gradual increase in its overall size and changes in its chemical composition. Waste products accumulate within its structure over a lifetime. External influences — such as the causal association of ultraviolet radiation and the effects of cigarette smoking<sup>7</sup> — affect the lens fibres and the progressive clouding of a once optically clear structure occurs, causing a cataract. The changes are often bilateral but may be asymmetric.

## Symptoms of cataract

Typically patients become aware of a gradual reduction in their vision. This can interfere in any number of vision-assisted activities of daily living, from difficulty with viewing distant objects to problems with reading. They may also be troubled by excessive glare in bright conditions, such as when the sun is low on the horizon. Difficulties can occur with contrast sensitivity, and colour appreciation can also be problematic, as the yellowing cataract reduces transmission of light from the blue end of the visual spectrum.

## Referral to eye services

In the UK patients will usually present, in the first instance, to their optician who will refract (testing for focusing errors, ie, the need for spectacles) and

**DR NICHOLAS WRIDE** is a specialist registrar in ophthalmology and **DR DAVID ALLEN** is a consultant ophthalmologist at Sunderland Eye Infirmary, Sunderland

perform a basic ocular examination. If vision cannot be improved with glasses and cataract is noted, they are then referred on to the local eye service, either directly by locally instituted cataract referral pathways or via the GP for consideration for cataract surgery. At the outpatient clinic visit the decision to operate comes after a thorough history, examination and discussion with the patient regarding the perceived risks and benefits of surgery to that individual. There are a number of questionnaires available to help assess the possible handicap attributable to cataract, concentrating on functional disability due to poor vision, but are mainly used as research tools. The timing of surgery is no longer dependent on the cataract being very advanced or 'ripe', although many elderly patients we see continue to believe this. Surgical techniques have advanced greatly over recent years with safer profiles and rapid visual rehabilitation. Indeed, the risks of serious complications may now be greater if the cataract has been left to an advanced stage<sup>8</sup>.

### Operative technique

Cataract surgery in the UK has seen a dramatic shift over the past 10–20 years. From being a predominantly inpatient based procedure requiring general anaesthesia, it has now almost exclusively performed under local anaesthesia as a day case. The modern and preferred method of cataract extraction is 'phacoemulsification' of the cataractous lens. This involves the controlled ultrasonic shattering of the crystalline lens structure within the eye combined with aspiration of the fragments using a single handpiece controlled by the surgeon. Access to the lens is achieved through an incision in the cornea or sclera which is 2–3mm in width. This small size allows for a more controlled operating environment and less likelihood of altering the shape of the cornea post-operatively compared with the significantly larger incisions required by the older manual lens extraction method. The capsular bag containing the native lens is deliberately left behind to allow placement of an artificial clear lens implant towards the end of the procedure. This 'in-the-bag' placement of the lens simulates closely the physiological state. Sutures to the wound are rarely needed as it is designed to be self-sealing. An injection of antibiotic is administered into the anterior chamber at the end of the procedure to reduce the incidence of post-operative endophthalmitis. This is the most feared complication following cataract surgery and can lead to complete visual loss but with the addition of this antibiotic the incidence can be reduced to approximately 0.05 per cent<sup>9</sup>.

### Outcomes

Visual outcomes following modern cataract surgery are excellent with significant advances made in the reduction of perioperative complications and improvements in uncorrected visual acuity through improved preoperative planning and lens design. Of all patients undergoing cataract surgery, 85–90 per cent will have 6/12 best corrected Snellen visual acuity (the driving standard), and this figure rises to 95 per cent in patients with no ocular co-morbidity<sup>10</sup>. Although modern cataract surgery is minimally invasive and fast, there are still risks attached to it. Endophthalmitis has been highlighted earlier, but around one per cent of patients will have a complication that will reduce the final vision, and around 0.1 per cent will have very serious sight-threatening complications and be functionally blind in the operated eye. Developments around lens selection and lens design have played a big part in this overall improvement. Within the NHS, patients are offered a unifocal lens calculated to give them good distance vision, but requires spectacles for near vision. This is not unlike the presbyopic situation, which most patients would have been familiar with preoperatively. Manufacturers are constantly seeking to refine their lenses and the multi-focal lens market, aimed at rendering patients completely spectacle free, is an expanding field.

### Cataract surgery and the elderly

This patient group present a number of specific challenges when it comes to cataract surgery. Due to their age they often have other eye-related illnesses and medical conditions that could influence the outcome of surgery.

#### Age as a risk factor

As the demand for cataract surgery increases, it has become clear more information is required to help refine future health policy. Interest in incorporating patient-derived, subjective measures of quality of life, satisfaction with health and functional status are increasing<sup>11</sup> — and it has been recognised that patients' self-assessed visual ability before and after surgery is a better measure of the surgical result than visual acuity alone<sup>12</sup>. The evidence on whether older age is a significant predictor of worse visual acuity outcome or not is, at present, conflicting. Lundström *et al*<sup>13</sup> found that age as a single variable was not associated with a worse outcome when data was adjusted for the higher incidence of ocular co-morbidity in the elderly. Norregaard *et al*<sup>14</sup> have, conversely, reported the opposite. Despite this,

however, it is clear that cataract surgery improves vision and patient satisfaction in the elderly age group. Surgery is beneficial, even when life expectancy is taken into account<sup>15</sup>.

### ***Cataract surgery and AMD***

Age-related macular degeneration (AMD) is the most common irreversible cause of visual loss within the developed world<sup>16</sup>, so it is little surprise to note an increase in co-morbidity in elderly patients presenting with cataract. The frequency of AMD in a European survey of patients undergoing cataract surgery was found to be 13.7 per cent<sup>17</sup>. This percentage is likely to rise in the future as the numbers of elderly patients increases. The question arises as to whether the cause of reduced visual acuity is due to cataract, AMD or a mixture of both and whether cataract surgery in these cases is beneficial. There are few practical tools available in the clinic to help predict the likely benefit of cataract surgery among individuals with these conditions preoperatively. However, there is evidence to show that good postoperative visual acuity is achievable in patients with early changes of AMD<sup>18</sup> and significant benefits from surgery in terms of visual

acuity and quality of life is possible in moderate cases<sup>19</sup>. It is, therefore, vital that a full and frank discussion is undertaken, highlighting realistic aims and expectations from surgery. From published reports, we know that approximately two-thirds of patients with significant AMD are satisfied with their vision following surgery<sup>20</sup>. Although the prognosis may be more guarded in these situations, surgery should certainly be considered for most cases with moderate cataract. A question that still remains to be answered satisfactorily among this group is whether or not cataract surgery has a detrimental effect on the natural history of AMD. It has been postulated that the changes ageing causes in the natural lens may, in fact, offer protection to the macula and by its removal the macula then becomes exposed to potentially damaging radiation at the blue/violet end of the spectrum.

### ***Surgery for the second eye and the impact on waiting lists***

Cataract is frequently a bilateral, though asymmetric, condition. The benefits of surgery are well documented<sup>21</sup>. What has become increasingly clear is

## Key points

- Cataract is the most common cause of reversible blindness.
- Significant improvement in vision and patient satisfaction is achievable among the elderly population following cataract surgery.
- Although ocular co-morbidities such as age-related macular degeneration are more common in the elderly, patients still benefit from surgery.
- Modern cataract surgery is now routinely done as a day case with rapid visual rehabilitation.
- Surgery to the second eye is beneficial to the elderly.

that cataract surgery on the second eye is beneficial if cataract is present. Patients who undergo surgery to both eyes demonstrate significantly greater improvement in functional impairment in visually demanding activities of daily living. They gain increased satisfaction with vision and significantly less self-reported trouble with their vision than patients who underwent cataract surgery in only one eye. This improvement associated with surgery in the second eye was also greatest in older patients. The recommendation for cataract surgery in the second eye ought to be the same as that for cataract surgery in the first eye — namely, impairment in the patient's ability to function in everyday life that is thought to be related to cataract and is of concern to the patient<sup>22</sup>.

Recent public and political concern has centred on prolonged waiting times for surgery. A recent study has shown that in the elderly population, patients waiting an average of nine months for surgery demonstrated no significant increase in visual symptoms or decrease in cognitive function during this period<sup>23</sup>.

## Conclusion

Cataract surgery has seen great advances, bringing real benefits to many patients. Surgery is now more convenient for patients, being performed as an outpatient procedure under local anaesthesia for the majority of cases. A rapid postoperative recovery means that patients are not unduly inconvenienced and should be able to return to their daily routine quickly. The recent increase in capacity for surgery in the UK and a waiting time for surgery that is now less than 13 weeks means many more people are benefiting from this procedure and the improvement in their quality of life in the process is a real plus to patients. Surely this counts as one of the most significant healthcare success stories of recent times.

**Conflict of interest: none declared.**

## References

1. McCarty CA, Keeffe JE, Taylor HR. The need for cataract surgery: Projections based on lens opacity, visual acuity and personal concern. *Br J Ophthalmol* 1999; **83**: 62–65
2. <http://www.hesonline.nhs.uk> (date last accessed: 12/06/06)
3. Chia E, Wang JJ, Rochtchina E, *et al*. Impact of Bilateral Visual Impairment on Health-Related Quality of Life: the Blue Mountains Eye Study. *Invest Ophthalmol Vis Sci* 2004; **45**(1): 71–6
4. Wang JJ, Mitchell P, Cumming RG, Smith W. Visual impairment and nursing home placement in older Australians: the Blue Mountains Eye Study. *Ophthalmic Epidemiology* 2003; **10**: 3–13
5. Wang JJ, Mitchell P, Smith W, *et al*. Impact of visual impairment on use of community support services by elderly persons: the Blue Mountains Eye Study. *Invest Ophthalmol Vis Sci* 1999; **40**: 12–19
6. Wang JJ, Mitchell P, Simpson JM, *et al*. Visual impairment, age-related cataract, and mortality. *Arch Ophthalmol* 2001; **119**: 1186–90
7. Kelly SP, Thornton J, Edwards R, *et al*. Smoking and cataract: review of causal association. *J Cataract Refract Surg* 2005; **31**(12): 2395–404
8. Osborne SA, Adams WE, Bunce CV, Fraser SG. Validation of two scoring systems for the prediction of posterior capsule rupture during phacoemulsification surgery. *Br J Ophthalmol* 2006; **90**: 333–6
9. Barry P, Seal DV, Gettinby G, *et al*. ESCRS Endophthalmitis Study Group. ESCRS study of prophylaxis of postoperative endophthalmitis after cataract surgery: Preliminary report of principal results from a European multicenter study. *J Cataract Refract Surg* 2006; **32**(3): 407–10
10. Royal College of Ophthalmologists. Outcomes and complications. In: *Cataract Surgery Guidelines*. London: RCOphth, 2004: 39–44
11. Mangione CM, Orav J, Lawrence MG, *et al*. Prediction of visual function after cataract surgery. *Arch Ophthalmol* 1995; **113**: 1305–11
12. Steinberg EP, Tielsch JM, Schein OD, *et al*. The VF-14: An index of functional impairment in patients with cataract. *Arch Ophthalmol* 1994; **112**: 630–38
13. Lundström M, Steveni U, Thorburn W. Cataract surgery in the very elderly. *J Cataract Refract Surg* 2000; **26**: 408–14
14. Norregaard JC, Hindsberger C, Alonso J, *et al*. Visual outcomes of cataract surgery in the United States, Canada, Denmark and Spain. Report from the international cataract outcomes study. *Arch Ophthalmol* 1998; **116**: 1095–1100
15. Mönestam E, Wachmeister L. Impact of Cataract Surgery on the Visual Ability of the Very Old. *Am J Ophthalmol* 2004; **137**(1): 145–55
16. Klein R, Klein BE, Linton KL. Prevalence of age-related maculopathy. The Beaver Dam Eye Study. *Ophthalmology* 1992; **99**: 933–43
17. Lundström M, Barry P, Leite E, *et al*. The 1998 European Cataract Outcome Study. Report from the European Cataract Outcome Study. *J Cataract Refract Surg* 2001; **27**: 1176–84
18. Pham TQ, Wang JJ, Maloof A, Mitchell P. Cataract surgery in patients with age-related maculopathy: preoperative diagnosis and postoperative visual acuity. *Clin Experiment Ophthalmol* 2005; **33**(4): 360–63
19. Armbrecht AM, Findlay C, Aspinall PA, *et al*. Cataract surgery in patients with age-related macular degeneration: one-year outcomes. *J Cataract Refract Surg* 2003; **29**(4): 686–93
20. Lundström M, Brege KG, Florén I, *et al*. Cataract surgery and quality of life in patients with age related macular degeneration. *Br J Ophthalmol* 2002; **86**(12): 1330–5
21. Riaz Y, Mehta JS, Wormald R, *et al*. Surgical interventions for age-related cataract. *Cochrane Database Syst Rev* 2006; **18**(4): CD001323
22. Javitt JC, Steinberg EP, Sharkey P, *et al*. Cataract surgery in one eye or both. A billion dollar per year issue. *Ophthalmology* 1995; **102**(11): 1583–92
23. Gray CS, Karimova G, Hildreth AJ, *et al*. Recovery of visual and functional disability following cataract surgery in older people: Sunderland Cataract Study. *J Cataract Refract Surg* 2006; **32**(1): 60–66