Safety and efficacy of manual small incision cataract surgery for phacolytic glaucoma

Safety and efficacy of manual small incision cataract surgery for phacolytic glaucoma

Geoffrey Tabin

In this issue Venkatesh and coworkers (see page 279) from The Aravind Eye Hospital in Pondicherry, India present their results of utilizing a manual sutureless extracapsular cataract surgery (MSICS) technique to treat thirty three consecutive cases of phacolytic glaucoma.¹ Pre-operatively the mean intraocular pressure was 46.2 mmHG. Post-operatively the IOP was 22 mmHg or less in all cases and 87.9% achieved a post-operative visual acuity of 20/60 or better! They had no major complications. There were no expulsive hemorrhages and not a single case of posterior capsule rupture. These results are spectacularly good and point out the efficacy of sutureless manual extracapsular cataract extraction. The surgical technique they describe is not only much faster and far less expensive than phacoemulsification for mature cataracts, but it may well be a better and safer technique in the most advanced cases, particularly when phacolytic glaucoma is present. The definitive treatment for phacolytic glaucoma is surgery to remove the lens. However, phacolytic glaucoma presents a very challenging problem for the surgeon. In most cases the lens changes are very advanced. The pathology includes micro-leakage of high molecular weight proteins through an intact anterior lens capsule. This leads to inflammation and obstruction of aqueous outflow causing a rise in intraocular pressure. The high intraocular pressure increases the risk of a suprachoroidal hemorrhage during surgery. In addition, the residual nucleus is usually rock-hard with little or no epinucleus remaining. These factors increase the risk of posterior capsule rupture or corneal damage with ultrasound emulsification of the lens. Finally, zonulysis often accompanies the lens changes making the surgery and lens implantation even more difficult. The self sealing tunnel incision of the surgical technique described in this paper maintains the anterior chamber and intraocular pressure during surgery providing the same safety against expulsive hemorrhage as a clear corneal phacoemulsification wound. The continuous curvilinear capsulorhexis, performed after trypan blue

staining, allows for "in the bag" intraocular lens placement and use of a capsule tension ring when needed. The gentle visco-irrigation of the residual nuclear disc from the bag and out of the eye protects both the lens capsule and the corneal endothelium. As the reported results attest, MSICS is an excellent approach to these challenging cases. Morgagnian cataracts, phacomorphic-glaucoma, black cataract nigra and brown cataracts with leathery capsules fused to the nucleus all present unique challenge that may also be better addressed with MSICS techniques rather than phacoemulsification. A report from Pradhan and Hennig from the Sagarmartha Choudhary Eye Hospital in Lahan, Nepal reported a series of 413 cases of lens induced glaucoma. Of these, 72% were phacomorphic.

At the Tilganga Eye Hospital in Kathmandu, Nepal, we also experience many more cases of phacomorphic glaucoma than phacolytic glaucoma. Our preferred technique for this condition is a modification of the MSICS technique where we use a previously described "V" capsulotomy that allows an easy and safe hydro-irrigation technique of the huge lens out of the capsular bag and into the anterior chamber. This is followed by hydroexpression of the lens through the self sealing tunnel incision and out of the eye. We use a similar technique to approach leathery capsules in which a continuous capsulorhexis is not possible, often employing a Vaness scissor to open the capsule under a bed of viscoelastic.

Finally, we experience a large number of Morgagnian cataracts where the entire cortex has been reabsorbed, leaving only a small hard nuclear disc that sinks inferiorly within the capsular bag. Very frequently these advanced lens changes are again accompanied by severe zonular compromise. We utilize a MSICS technique where we make a small slit in the capsule under viscoelastic and often implant a one piece PMMA lens into the capsular bag prior to irrigating the nucleus out of the capsule. The MSICS techniques allow a safe surgical approach to treat many of the most difficult and complex problems one

faces when dealing with mature and hyper-mature cataractous lenses. A previous article from the same authors in The British Journal of Ophthalmology reported the excellent outcomes and incredible speed of their MSICS technique for routine cases. A single doctor often performed more than 100 surgeries in a single day. Similarly we have reported on our delivery technique from the Tilganga Eye Hospital in Kathmandu, Nepal where we achieve similar efficiency at a cost of less than twenty US dollars per case. In much of the ophthalmology world there has been a bias towards phacoemulsification as being the current best method to remove cataracts. The presumption has been that phacoemulsification may be more expensive and equipment dependent, but that it yields superior results. In order to answer the question of whether there is indeed a difference in the quality of outcomes between the two methods for treating advanced cataracts in the developing world, we conducted a prospective randomized trial in Nepal. We brought one of the leading teachers and innovators of phacoemulsification technology and skills from the United States and equipped him with all of the instruments and equipment he uses in his California practice. We then performed a trial at an outreach microsurgical clinic in Nepal. Patients randomized to receive phacoemulsification or MSICS. The results which will be presented at the 2006 meeting of the American Academy of Ophthalmology and published in the December issue of the "American Journal of Ophthalmology" show no statistical difference in corrected or uncorrected visual acuity when analyzed at the 20/40 level at any time from one week to six months. The cost and speed for the MSICS surgery was much less than for the phacoemulsification. According to the most recent WHO estimates there are now well over 20 million people on our planet who are blind from cataracts. These are people with a best visual acuity, in the better eye, of worse than 20/400. There is a great need for efficient, safe, affordable, and high quality cataract surgery. MSICS is an important surgical technique that can address the most complex and difficult cataract cases and has great advantages in speed and cost over other techniques.

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Cataract surgery

Do waiting times really matter?

Melissa M Brown

Shortening the waiting time for cataract surgery improves patients' quality of life

Mojon-Azzi and Mojon¹ have performed a superb analysis (see pages 282) which demonstrates that the waiting time for cataract surgery in 10 European countries is influenced primarily by the total expenditure on health ($p < 0.01$). Of note is the fact that public expenditure on health, physician density and acute hospital bed density did not significantly influence waiting times.

Since cataract waiting times differ significantly among countries ($p < 0.001$), a reasonable question to ask is, “do waiting times really make a difference for the average patient?”. Fortunately, a value-based medicine analysis sheds some light on this issue.

Excellent evidence-based data come from the PORT study, in which the average person who underwent cataract surgery had a visual acuity of 20/83 in the affected eye.^{2–3} The average postoperative visual acuity, factoring in the complications of posterior capsular opacification, endophthalmitis, loss of lens particles into the vitreous cavity, intraocular lens dislocation, retinal detachment, cystoid macular oedema and bullous keratopathy, was 20/27.³

Utility values allow us to reproducibly quantify the quality of life associated with a health state.⁴ Utilities also allow us to calculate the total value (improvement in

quality of life and length of life) conferred by virtually all interventions. For ocular procedures, the value gain is typically conferred by improvement in quality of life rather than improvement in length of life.

With vision, utility values decrease as the corresponding visual acuity in the better-seeing eye decreases.⁴ Assuming that patients undergoing surgery have cataracts that are equal in both eyes, the utility value associated with 20/83 vision preoperatively is 0.71 and the utility value associated with 20/27 vision postoperatively is 0.858.³ This results in a 0.148 (0.858–0.71) utility gain conferred by the cataract surgery.

The mean age of SHARE patients waiting for cataract surgery was 73.8 years.¹ The average life expectancy for a person of this age is approximately 13 years.^{5–6}

The mean waiting time in the SHARE study was 3.3 months, but the wait to see an ophthalmologist can be up to a year.¹ Therefore, a total of 15.3 months could be necessary from the time a patient notes disabling visual loss until the responsible cataract is removed.

To calculate the quality of life lost in this instance (in quality-adjusted life-years, QALYs)^{3–4} by delaying cataract surgery, the utility gain conferred by cataract

surgery is multiplied by the time (in years) from visual loss until the cataract is removed. Thus, there is a (0.148 utility gain $\times$ 1.275 years) = 0.19 QALY gain.

Looked at in another way, the average patient waiting 15.3 months for cataract surgery has a 21% diminution in quality of life, or life's value, during this time. This is a dramatic diminution in quality-of-life, equivalent to having an amputation versus no amputation or having clinically relevant coronary artery disease versus having none.⁷ Averaged over the remaining lifetime of the patient, the 15.3 month wait for surgery results in a 1.6% diminution in quality of life on a daily basis. This latter percentage is not as severe as the diminution during the waiting period but is still considerable when it occurs only secondary to waiting!

In essence, the quality of life associated with various health states includes more than just what happens on the days of surgery or another intervention. As healthcare providers, we should do our best to maximise the value we confer to our patients. Shortening the waiting time from the start of visual disability until the responsible cataract is removed, or alternatively the waiting time for many other healthcare interventions, is a good way to begin.

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