Community Eye Health JOURNAL

Volume 17 | Issue No.52 | December 2004 | INDIAN SUPPLEMENT - Official Publication of the "VISION 2020: The Right to Sight - India Forum

Indian Supplement Editorial Board

Dr Damodar Bachani
Dr GVS Murthy
Dr GV Rao
Dr Asim Kumar Sil
Dr Parikshit Gogate
Dr Praveen K Nirmalan
Dr BR Shamanna

Published for "Vision 2020: The Right to Sight - India Forum" from International Centre for Advancement of Rural Eye Care, L.V. Prasad Eye Institute, Banjara Hills, Hyderabad 500 034, India. E-mail: JCEH-India@icare.stph.net

Editorial Assistance: Dr Usha Raman, Mr Sam Balasundaram, Ms Sarika Jain Antony

Supported by ORBIS International India Country Office

Surgical audit at H.V.Desai Eye Hospital, Pune: causes of poor postoperative visual outcome

Parikshit Gogate, Madan Deshpande, Amar Maske, Seema Jagdale
H. V. Desai Eye Hospital, 93/2 Tarawade Vast, Hadapsar, Pune, India

Introduction

'Quality' is no more an intangible concept in health care, and increasingly has a tangible component that is identified and measured. Increased patient expectations, new medico-legal standards and rapidly changing technology in eye care make measurement of quality a necessity. Clinical audit is a tool that can be used to monitor quality in eye care delivery. The audit tells us whether we are actually doing what we are supposed to do, and whether we are doing it well.

The World Health Organization has recommended that postoperative visual outcome after cataract surgery should be 'Good' (post-operative visual acuity >=6/18) in around 90% of the cases and 'Poor' (postoperative visual acuity <6/60) in less than 5% of the cases.[1] The clinical audit of surgical results (the surgical audit) helps to evaluate the postoperative visual results, find out the proportion of good, borderline and poor outcome and to determine the cause of poor outcome so remedial steps can be taken. The objective of the audit was not to compare between surgeons, but for the surgeon to compare his/her results over a period of time.

Methods

The surgical results of all outpatients operated for cataract from 1 April 2001 to 31 October 2002 (the last eight months of 2001 and the first eight months of 2002) were considered for the audit. The hospital began using the Christoffel Blinden Mission guidelines for quality monitoring in March 2001. Only outpatients were considered as their follow-up was done at the hospital. 'Camp' patients were recruited from primary health centres and rural hospitals in the periphery, brought to the hospital to receive high-quality surgery and sent back to the parent centre for further follow up. Permission was sought and obtained from the hospital's managing committee and the ethical committee.

Material

The operative case papers of H. V. Desai Eye Hospital, Pune (HVDEH) were reviewed retrospectively. The case sheets were studied to note the details of follow up and the final postoperative visual acuity. Any cause for subnormal postoperative vision was noted. The cataract surgical techniques used were extracapsular cataract extraction (ECCE) (conventional, small incision and phacoemulsification) with posterior chamber intra-ocular lens (PCIOL) implantation. Each surgeon's results were compared for the year 2001 and 2002. The cause for poor outcome (postoperative visual acuity <6/60) was identified as being either due to 'selection' (pre-operative problem), 'surgery' (intra-operative complication), 'sequelae' (postoperative complication) or 'spectacles' (large spherical or cylindrical refractive error).[2]

Data entry and analysis were done in Epi-info software at the hospital's community eye care department. Surgeons were given their surgical results once in six months with causes of poor outcome. Patients were counselled about importance of follow up and good postoperative care.

Results

During the study period, 3305 patients underwent cataract surgery in 2001 and 5149 patients in 2002 at HVDEH. Almost all the surgery (99.7%) used the ECCE procedure, and 98% had intraocular lens implantation. Combined trabeculectomy and IOL implants were performed for 100 patients (27 in 2001 and 75 in 2002). Thirteen surgeons in 2001 and 20 surgeons in 2002 performed surgeries.

The learning curve

The ECCE cases include a few manual small incision cataract surgeries (MSICS) and phacoemulsifications for learning/training of new surgeons; or because the technique was thought to be most suitable for the patient. For instance, young patients received MSICS, while phaco was done in case of bleeding disorders, or if lignocaine sensitivity dictated phacoemulsification under topical anesthesia.

Two hundred and ninety nine (8.9%) of 3305 patients in 2001 and 314 (6.2%) of 5149 patients in 2002 had poor post-operative visual outcome (Table 2). Two thousand three hundred and sixty nine (71.9%) patients in 2001 and 3747 (72.7%) patients in 2002 completed the mandatory six-week follow-up. Three hundred and fifty six (10.8%) patients in 2001 and 587 (11.4%) patients in 2002 did not come to the hospital after

Table 1: Postoperative visual outcome

Visual outcome	Poor	Borderline	Good	Total
Year 2001	354 (10.8%)	1215 (36.9%)	1724 (52.4%)	3305 (100%)
Year 2002	317 (6.2%)	1507 (29.3%)	3325 (64.5%)	5149 (100%)

Table 2: Postoperative follow-up

Year	1st post-op day	1st week	6 week	Total
2001	356 (10.8%)	567 (17.2%)	2369 (71.9%)	3305 (100%)
2002	587 (11.4%)	822 (15.9%)	3747 (72.7%)	5149 (100%)

Table 3: Follow-up completed and postoperative visual outcome in 2002

Follow-up/outcome	Poor	Borderline	Good	Total
1st post-op day	23 (3.7%)	510 (87.2%)	51 (8.7%)	585 (100%)
One week	55 (6.7%)	545 (66.4%)	220 (26.8%)	821 (100%)
Six week	238 (6.4%)	452 (12.1%)	3054 (81.5%)	3742 (100%)
Total	317 (6.2%)	1507 (29.3%)	3325 (64.5%)	5149 (100%)

Table 4: Causes of poor postoperative visual outcome

Cause	Selection	Surgery	Sequelae	Spectacles	Loss to follow up	Total
Year 2001	100 (3.0%)	97 (2.9%)	98 (2.9%)	4 (0.1%)	57	354(10.8%)
Year 2002	171 (3.3%)	46 (0.9%)	95 (1.8%)	2 (0.0%)	3	317 (6.2%)

Table 5: Poor postoperative outcome (percentage) for each surgeon

Surgeon	2001	2002
A	7.6	2.2
B	6.9	9.4
C	9.4	6.8
D	12.3	4.8
E	9.9	6.8
F	14.5	7.2
G	16.3	6.9
H	12.2	2.3
I	3.4	6.7
J	8.0	7.5
K	5.9	0.0
L	9.5	4.3
M	14.6	4.5
Average (%)	10.8	6.2

discharge the next day. Five hundred and sixty seven (17.2%) patients in 2001 and 822 (15.9%) in 2002 came only for the one-week follow-up. These patients had visual outcome poor in 3.7% and 6.7%, borderline in 87.2% and 66.4% and good in 8.7% and 26.8% respectively on the first postoperative day and first week follow-up. This borderline outcome is because refractive error correction was not given on the first postoperative day and the first week follow-up.

Causes attributable to 'selection' of cases responsible for poor outcome (100 patients in 2001 and 171 in 2002) included due to corneal opacity, glaucoma, lens (subluxation, dislocation, *and complicated cataract*), iridocyclitis, retinal pathology (dystrophy, degeneration, retinopathy, vasculitis, and retinitis), retinal detachment, vitreous hemorrhage, optic nerve and other causes.

Intra-operative complications, where 'surgery' was responsible for poor postoperative visual outcome was seen in 97 patients in 2001 and 46 patients in 2002, and reasons included posterior capsular rent, vitreous loss, retained cortex, bleeding and others *(iridodialysis, endothelial injury, etc.)*. Postoperative sequelae were seen in 98 patients in 2001 and 95 in 2002 and included corneal decompensation/chronic corneal oedema, iris prolapse, uveitis, posterior capsular opacification, vitreous haemorrhage, retinal detachment, secondary glaucoma, endophthalmitis and others.

Four patients in 2001 and 2 in 2002 had issues relating to 'Spectacles' as responsible for poor postoperative visual outcome (due to errors in A-scan, aphakia). Loss to follow-up was a contributory cause for 57 patients in 2001 and 3 patients in 2002.

Discussion

For hospital settings, the failure of cataract surgery (based on a definition of worse than 3/60 vision) has been reported to vary widely, from 2.3% in a General Hospital in Kuwait[3]; to 38.8% in the hospitals of Shunyi county of China[4].

The poor outcome in our study compares with that in other parts of the world, considering that many 'difficult' or 'compromised' cases were selected. A large randomised control trial conducted in the same hospital during the same period reported poor outcomes only in 1.8% of operated patients.[5] The numbers of difficult cases that the hospital handles ('selection', those with a preoperative problem) have increased. 'Surgery' as a cause for poor outcome decreased from 2.9% in 2001 to 0.9% in 2002. Postoperative sequelae as a cause for poor outcome also decreased from 2.9% in 2001 to 1.8% in 2002.

A.J.Singh[6] assessing different public-funded options for cataract surgery discovered 25 out of 70 patients (35.7%) operated in government camps (ICCE), 4 out of 49 patients (8.1%) operated in state medical college hospital and 7 out of 126 patients (5.6%) operated in non-governmental hospital were blind (BCVA < 6/60). According to his analysis, cataract surgery outcomes in India have been relatively poor, particularly in field settings—hospital based surgical outcomes would be expected to be better.

The follow-up in our hospital was only 73.2% (though it has improved from 2001), with a large proportion of patients with borderline visual outcome. This needs

to be addressed through better postoperative counselling. Uncorrected refractive error resulted in many patients having borderline outcome on the hospital's case sheets.

The hospital has walk-in patients from a radius of nearly 300 km. Pune district has 258 ophthalmologists, spread out across the area. The patients who received surgery at our hospital preferred to have their postoperative follow-up check ups elsewhere, so it became difficult to track outcomes. This is a major lacuna that needs to be addressed. The postoperative briefing to all patients on discharge ensured that those with any problem or subnormal vision reported back to the hospital. A case of poor outcome is unlikely to have been missed.

Conclusion

Quality monitoring, patient counseling and surgeon education reduced the incidence of poor outcome after cataract surgery. Clinical audit is an essential tool to monitor performance continuously to ensure and improve quality of eye care provided to the cataract patient. It can improve patient confidence in the hospital, sensitise surgeons to the quality of care and benefit the institution as a whole.

References

1. Parajasegaram R. Importance of monitoring cataract surgical outcomes *Community Eye Health Journal* 2002; Vol 14 Issue 49: 49-50.
2. Limburg H. Monitoring cataract surgical outcomes: Methods and Tools. *Community Eye Health* 2002; Vol 15 Issue 44: 51-53.
3. Salem M A, Ismael L. Factors influencing visual outcome after cataract extraction among Arabs in Kuwait. *British Journal of Ophthalmology* 1987; 71: 458-61.
4. Zhao J, Sui R, Jia L, et al. Visual acuity and quality of life outcomes in patients with cataract surgery in Shunyi county, China. *American Journal of Ophthalmology* 1998; 126: 515-23
5. Gogate PM, Deshpande MD, Wormald, Deshpande RD, Kulkarni SR. Extracapsular cataract surgery compared with manual small incision cataract surgery in community eye care setting in Western India: a randomized controlled trial. *Br J Ophthalmol* 2003; Vol 87: 667-672
6. Singh AJ, Garner P, Flyod K. Cost-effectiveness of public-funded options for cataract surgery in Mysore, India. *The Lancet* 2000; 335: 180-4

Bridging the Training Gap : Converting from Sutured to Sutureless Non-Phaco Cataract Surgery

Samar K Basak
Disha Eye Hospitals & Research Centre
Barrackpore, Kolkata - 700 120, India.
E-mail: disha@cal2.vsnl.net.in

This article provides a few pointers for those who are beginning to move from sutured to sutureless non-phaco catarct surgery. This is a necessary but tricky transition and it is important that the move is made as easily as possible without a steep learning curve.

Some prerequisites for beginners include:

1. Clear cornea with healthy endothelium
2. Widely dilated pupil
3. Normal anterior chamber depth
4. Intact capsulo-zonular attachment
5. Grade II and Grade III cataracts
6. Not too much hypotony of the globe
7. Use of a sharp crescent knife and 2.8 mm keratome
8. A good catching episcleral forceps
9. A good irrigating vectis with 3 irrigation-holes at the tip
10. Adequate viscoelastic substance

The most important goal to keep in mind while moving from suture to sutureless non-phaco cataract surgery is to -

i) deliver the nucleus safely through sclero-corneal tunnel, and
ii) create a watertight sclero-corneal flap valve incision.

The steps for conversion from sutured to sutureless non-phaco cataract surgery are briefly described here:

Step 1: Nucleus prolapse and delivery during conventional sutured ECCE

Lift the nucleus from the capsular bag into the anterior chamber through a can-opener capsulotomy. First, drag the nucleus slightly towards the equator. Depress one pole of the nucleus to prolapse the opposite pole. Then lift the opposite pole and rotate the edge of the nucleus in clockwise or anti-clockwise direction with a Sinsky hook.

One should try to deliver the nucleus by irrigating vectis through conventional ECCE incision. Provide adequate viscoelastic material (HPMC) in front and behind the nucleus to protect the endothelium as this is an open chamber. Gently depress the posterior lip of the wound and simultaneously rotate the globe forward and downward with the help of a superior rectus suture or episcleral forceps.

Step 2: Change from can opener capsulotomy to capsulorhexis

Practicing capsulorhexis on boiled potato skin is a good simulation. Initially, let the capsulorhexis be smaller. Give a few relaxing incisions or perform outer can-opener capsulotomy. Try to make a bigger capsulorhexis if the nucleus is big and harder. Though a can-opener or an envelope capsulotomy works perfectly fine, one has to be careful during hydro-procedures.

Step 3: Change from Limbal incision to Sclero-corneal Tunnel

The external scleral groove: This is made to a depth of ½ to ?rd , using a No.11 or 15 blade. Initially, make an incision 0.5 to 1.0 mm posterior to your own incision. Then the incision location is gradually shifted further posterior. First, it is parallel to the limbus, then runs straight and finally becomes a frown incision (Fig: 1). The initial incision is usually 7.0 to 7.5 mm long. Gradually make the external incision smaller, practicing with nuclei that are not so hard. The size is ultimately determined by the optic size of IOL, the diameter and hardness of the nucleus . It is always preferable to shift the incision towards the right of the superior limbus (centering at the 11 O'clock position) as the hand usually moves more comfortably in this direction.

a. *Tunneling Forward:* This is done by a disposable 'crescent' blade. The forward and side-to-side movement must be smooth and gentle. During tunneling the uphill anatomy of the sclero-corneal area must be kept in mind. It is preferable to grasp the episcleral tissue just 1mm left to the external incision rather than to hold the scleral lip during tunneling.

b. *Anterior chamber entry:* Dimple down entry by a 2.8 mm keratome and make it parallel to the external incision.

c. *Extension of internal incision on either side:* Fill the anterior chamber with viscoelastic material and then extend the internal incision on either side with the same keratome or with a 5.5 mm keratome. The internal incision must be parallel to the limbus.

d. *Scleral pocket dissection:* This accommodates not only the diameter of the nucleus but also its thickness, and provides more space for larger and thicker nuclei. Such incisions are not necessary in all cases, especially not in softer nuclei.

e. *Side-port incision:* This is an optional situation. For beginners, it helps to clean all sub-incisional cortexes. One has to use smaller caliber of a two-way canula through this side-port.

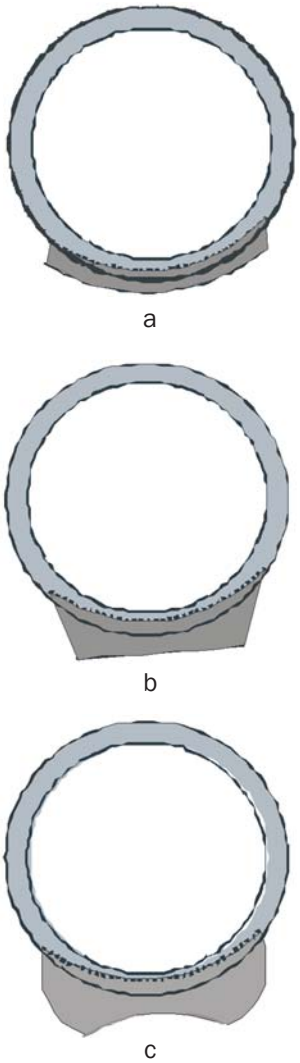

Fig 1: Stepwise tunnel making: a) slightly posterior incision with small tunnel; b) more posterior straight incision with wider tunnel; c) frown incision with ideal tunnel with scleral pockets on either side.

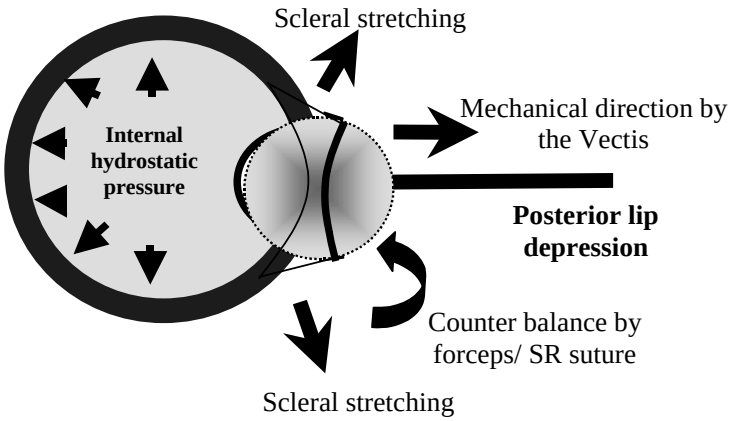

Fig 2: Mechanisms of nucleus delivery by irrigating th e vectis.

Some other tips:

1. Make a *triangular conjunctival flap for better wound closure.*
2. *Dissect the entire Tenon's attachment* from the scleral bed for a smooth external incision.
3. *Allow the nucleus to hydro-prolapse into the anterior chamber in capsulorhexis after completion of hydrodissection.*
4. *It is advisable not to struggle during the nuclear prolapse*. Most of the time, zonular dehiscence occurs during this step. A small rhexis is the most important cause for this.
5. *The nucleus can be delivered by irrigating the vectis,* which can be used directly via the Ringer's Lactate tubing system or by fitting it with a 5cc syringe filled with Ringer's Lactate solution.

In this mechanism, the main forces behind nucleus delivery are (Fig: 2):

i) The internal hydrostatic pressure,
ii) The mechanical pull by the irrigating vectis,
iii) Depression of the posterior lip of the wound by the vectis (Remember, if we lift the anterior lip we close the wound, but if we depress the posterior lip we open the wound),
iv) Scleral stretching by the nucleus, and
v) Counter balancing forwards and downwards force by the SR suture or episcleral forceps.

6. *Tunnel washing:* After the surgery , it is important to thoroughly wash the tunnel with Ringer's Lactate solution using a canula. If scleral pockets have been made, they too should be washed. Failure to do this is one of the major causes of prolonged postoperative uveitis.
7. *Viscoelastic, viscoelastic, viscoelastic!* Enough viscoelastic material (usually HPMC) is required at almost every step. This is essential -

i) to build up pressure during tunnel making and capsulorhexis.
ii) to protect the corneal endothelium.
iii) to inflate the capsular bag before IOL placement.

In conclusion, during manual SICS, if the surgeon feels uncomfortable at any step, it is better to convert it into sutured surgery without hesitation by giving two cuts on either side of the tunnel and then extends with corneal scissors. On the other hand, after a successful manual SICS, if he feels insecure about wound stability, it is better to use two radial sutures or a horizontal mattress suture at the end, for the safety of the patient.

Call for contributions

Journal of Community Eye Health – Indian Supplement invites short articles & experiences from service providers within the country on the issue of

"Red eye and its management"

at primary, secondary and tertiary levels of care for the forthcoming issue (number 53) of the journal. Articles and experiences not exceeding 1200 words, with no more than 6 references and 2 photographs should reach the office of the editor before 31 March 2005.

The Editor
Journal of Community Eye Health – Indian Supplement
ICARE-LVPEI, L V Prasad Marg
Banjara Hills, Hyderabad 500 034
E-mail: JCEH-India@icare.stph.net