

Decision Making in Surgical Management - Coexisting Cataract and Primary Open Angle Glaucoma

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Introduction:

Cataract and glaucoma are the two leading causes of blindness worldwide in aging population. No uniform recommendations can be proposed when the two conditions are associated. Presence of cataract can affect the assessment of glaucoma progression, while cataract extraction affects the intraocular pressure and effectiveness of glaucoma surgery. On the other hand, glaucoma surgery significantly increases the risk for the development of cataracts. For this reason, the prevailing trend is to perform a combined procedure, taking care of both pathologic conditions in a single setting¹. In the presence of concomitant cataract and primary open angle glaucoma, one may argue that cataract extraction alone can help reduce IOP. Cataract surgery in non-glaucoma patients may transiently decrease IOP whereas it seems to have no effect on diurnal IOP fluctuations.

Effect Of Cataract Surgery Alone On Glaucoma - Pathophysiology :

As a result of cataract extraction, Anterior lens capsule is repositioned behind the Schlemm's canal result of which tendons of the ciliary muscles may produce a traction on the ciliary body which causes decreased aqueous humour production or dilation of the trabecular meshwork and the Schlemm's canal. Also, it has been hypothesised that low inflammation induced by PHACO could decrease aqueous humour production or, alternatively, increase uveoscleral outflow via a prostaglandin-mediated mechanism.

Decision To Do A Filtering Surgery Alone Or A Combined Procedure Is Determined By Evaluation Of The Following Factors :

Maximum uncontrolled iop, IOP control on current treatment, Required target iop for the patient, Number of medications needed to achieve target iop, Extent of glaucomatous damage (disc and visual fields), Compliance to medical therapy, Allergic reactions/ significant side effects of topical therapy , Socio-economic status of the patient, Access to medical care facilities & Effect of disease on quality of life of the patient , likelihood and ability to comply with postoperative care regimen and visits to clinic.

Goal Of Treatment :

- 1 To achieve an adequate long term control of intraocular pressure (IOP).
- 1 To avoid postoperative IOP spikes which are deleterious to the health of the optic nerve head .
- 1 To obtain an optimal visual rehabilitation.

Cataract Surgery Alone

The evidence showed that cataract surgery alone lowered the IOP 2 to 4 mm Hg for 1 to 2 years after the surgery². This finding was supported by other published studies³⁻⁵

Indications : Acceptable IOP control on 3 or less medications - assuming absence of allergy problems and no need for systemic CAI, no significant glaucomatous visual field loss or cupping and higher preop IOP/narrow angles with healthy nerve

Advantages : a. Restore vision promptly, Single procedure, Technically easiest - short surgical time, b. Reduced operative and post-op complications related to wound, c. Opportunity for glaucoma operation later if

needed - multiple options, d. Small incision phacoemulsification itself can yield improved long-term IOP control.

Disadvantages : a. Early post-op IOP rise: 1-8 hours post-op. Mean IOP is 31 mm Hg at 4 hours in PXF and POAG eyes. Cause- TM collapse in area of incision, pigment or cortical debris, breakdown of blood - aqueous barrier, altered prostaglandin metabolism, toxic damage to TM, viscoelastic effect. b. Reduced long-term IOP control compared to combined surgery, c. Future filtration surgery success is compromised, especially if conjunctiva violated, d. Early (30 min - 1 hour) post-operative hypotony may be more frequent and e. No change diurnal IOP fluctuation .

Combined Cataract And Glaucoma Surgery

Indications: a. More than 3 medications required for good IOP control or use limited by allergy or medical contraindications, b. Presence of significant glaucomatous visual field loss and cupping, c. Presence of other significant risk factors for glaucoma (e.g. Pseudoexfoliation , pigment dispersion, angle recession), d. Monocular status may favor combined surgery, e. Unable to tolerate 2 separate operations.

Advantages: a. Restore vision promptly, Single procedure, b. Reduced glaucoma medication requirements post-op, c. Good early post-op IOP control, d. Better long-term post-op control with phacotrabeculectomy than cataract extraction alone², e. Antimetabolites possible - enhanced success with possibility of more complication, f. Multiple glaucoma surgical options.

Disadvantages: a. More complications than cataract extraction alone - shallow AC, bleb leak, choroidal effusion/hemorrhage, hypotony , infection, dellen, astigmatism, postoperative myopic shift, b. Longer surgery time than cataract extraction alone, c. More intensive post-op care requirements than cataract extraction alone - important for patient and surgeon, d. Less IOP control than 2-stage procedure, e. Glaucoma

medications often required post-op, f. Against-the-rule (ATR) astigmatism - may be exacerbated with larger superior incisions/antimetabolites.

Filtering Procedure Followed By Cataract Extraction At A Later Date

Indications: a. Glaucoma immediate threat to vision, b. Difficult glaucoma where IOL not indicated in acute situation - active uveitis, active NVG, c. Success with subsequent phaco makes this option reasonable.

Advantages: a. Best for immediate IOP control, b. Best for long-term IOP control, c. Reduced glaucoma medication requirements post-op, d. Successful filter/tube eliminates need for miotics - occasionally improves vision post-op in patient with cataract, e. Opportunity for glaucoma enhancement procedure at time of cataract surgery - multiple options.

Disadvantages: a. 2-stages - delayed visual recovery, b. Subsequent cataract surgery-Some amount of IOP control is lost and more challenging in presence of bleb - multiple issues.

Patient With Controlled Glaucoma And A Visually Significant Cataract

Phacoemulsification alone 2-5 is preferred- Transient 2-4 mm Hg reduction in IOP for 1-2 years and should be considered for patients with mild-to-moderate glaucomatous optic neuropathy controlled with 1 or 2 glaucoma medications. Specific glaucoma subgroups like ACG, PEX glaucoma, aqueous misdirection, phacomorphic glaucoma, phacolytic glaucoma, and glaucoma secondary to microspherophakia, have improved IOP control following phacoemulsification alone. Post-operative period - 28% of primary OAG patients have worse IOP control and that 7% require filtration surgery within 2 years of phacoemulsification.

Patient With Uncontrolled Glaucoma And Cataract

This scenario is unlikely to be improved by phacoemulsification alone. Although TRAB surgery alone

may provide slightly better IOP control than combined phacotrabeculectomy, the effect of subsequent cataract surgery on bleb function remains open to debate. Possibility of reduced risk with 1 versus 2 procedures, increased cost of 2 procedures, and longer visual rehabilitation, all support combined phacotrabeculectomy⁶ as the procedure of choice in this situation. Technically, a 2-site approach with the addition of mitomycin-C may provide additional IOP reduction.

Patient With Advanced Glaucomatous Optic Neuropathy With Mild-Moderate Cataract

If prevention of post-operative IOP spikes and long-term IOP reduction are of paramount importance, performance of trabeculectomy with mitomycin-c⁷ first, followed at least 6 months later by cataract surgery (if required) would be the most appropriate approach. With current trabeculectomy day surgery, the rate of subsequent cataract progression may be such that a significant number of patients will be visually satisfied and never require cataract surgery.

Conclusion

Combined cataract and filtering surgery is a feasible and successful approach to treat coexisting glaucoma and cataract. Success rates vary as compared to filtering surgery alone and the treatment needs to be individualized for each patient. Phacoemulsification is the preferred technique to remove cataract in a combined procedure. Use of mitomycin C in combined surgery with a greater IOP reduction. Long term follow up with regular assessment of the intraocular pressure, optic disc and visual fields should be done. Choice of different techniques of glaucoma surgeries combined with phaco surgery depends mainly on complexity of cataract and glaucoma as well as on the surgeon's discretion.

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