

Glaucoma Drainage Implants in Asian Eyes

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Modern microsurgical techniques have increased the success rate of conventional filtration surgery in most patients with glaucoma to 80 to 90%. However, previous studies have suggested that there are racial differences in the outcome of conventional filtration surgery with Asian patients reported to have poorer surgical outcomes than Caucasians.

No studies have examined the outcome of glaucoma drainage implants in Asian eyes. This study was designed to assess the outcome of glaucoma drainage implants in Asian eyes and to determine whether there are racial differences compared with previous reports in Caucasian patients.

Materials and Methods

83 Asian patients (83 eyes) who underwent glaucoma drainage implant surgery at the Singapore National Eye Centre from 1 January 1993 to 31 August 1996 were included in the review. Table 1

Table 1. Racial origins of patients receiving glaucoma drainage implant surgery

Chinese	66
Malay	9
Indian	6
Other Asian race	2

shows the racial origins of the patients included in the study. All patients had complicated glaucoma, defined as "those patients who previously have failed conventional medical, laser, or nonseton surgical treatment, or some combination thereof." The diagnoses of these patients are shown in table 2.

Two types of drainage implant were used in the study — 29 Molteno implants and 54 Baerveldt implants. The model was chosen at the discretion of the surgeon in a non-randomised fashion. A single stage procedure was performed and the postoperative management was similar for all patients. The sites for implant fixation included the supertemporal quadrant, superonasal quadrant, inferonasal quadrant, and inferotemporal quadrant. The site was chosen according to factors such as scleral thinning,

Table 2. Diagnoses of patients receiving glaucoma drainage implants

Diagnosis	Number of eyes
Neovascular glaucoma	35
Post-traumatic glaucoma	12
Post-corneal graft glaucoma	9
Pseudophakic glaucoma	7
Uveitic glaucoma	7
Primary open angle glaucoma (with previously failed trabeculectomy)	4
Post-vitrectomy glaucoma	3
Iridocorneal endothelial syndrome	2
Congenital glaucoma	2
Chronic angle closure glaucoma	2

conjunctival scarring, accessibility of the orbit, presence of peripheral anterior synechiae and depth of the anterior chamber.

Topical tobramycin, prednisolone forte and homatropine were given routinely for the first 6 postoperative weeks. Intraocular pressure (IOP) was measured with a Goldmann applanation tonometer at each visit and antiglaucoma medication was added, as required, to supplement pressure reduction. Outcome was assessed in terms of IOP, visual acuity, and the incidence of complications. The IOP criteria for success were as follows:

- complete success — IOP < 22 mm Hg without medication
- qualified success — IOP < 22 mm Hg with 1 or more medications
- failure — IOP ≥ 22 mm Hg with or without medication.

The follow-up period ranged from 6 to 40 months (mean 13.41 months).

Results

The mean IOP was reduced from 40.43 ± 9.72 mm Hg (range 18–68 mm Hg) to 14.16 ± 6.29 mm Hg after surgery. 71 patients (85.5%) achieved a final IOP of < 22 mm Hg, of whom 61 patients did not require medication and were classified as a complete success (table 3). The remaining 10 patients who acquired an IOP of < 22 mm Hg with medication were considered to be qualified successes. The remaining 12 patients, including 6 who lost light perception, were classified as failures.

The final best corrected visual acuity improved for 22 patients, remained the same for 49 patients and worsened for 12 patients compared with the preoperative baseline (table 3).

The Baerveldt implant had a better outcome than the Molteno implant in terms of IOP control. There were 45



Table 3. Success rates following glaucoma drainage implant surgery according to intraocular pressure (IOP) reduction and visual acuity

IOP reduction		Visual acuity	
Outcome	Number (%)	Outcome	Number (%)
Complete success	61 (73.5)	Improvement	22 (26.5)
Qualified success	10 (12)	No change	49 (59)
Failure	12 (14.5)	Deterioration	12 (14.5)

Table 4. Success rates for the Baerveldt and Molteno implants

Outcome	Baerveldt implant		Molteno implant	
	250 mm ² (n = 30)	350 mm ² (n = 24)	Single plate (n = 12)	Double plate (n = 17)
Success	24	21	8	8
Qualified success	2	2	2	4
Failure	4	1	2	5

(83.3%) successes among 54 patients receiving the Baerveldt implant compared with 16 (55.2%) successes among the 29 patients given the Molteno implant (table 4).

There were no intra-operative complications, although postoperative complications occurred in 46 eyes and 20 eyes required surgical revision.

Discussion

Glaucoma drainage implants have gained widespread acceptance for the treatment of severe recalcitrant glaucoma. For many patients they offer the only alternative to

cyclodestructive procedures to the ciliary body. The drainage implants used in this study resulted in satisfactory IOP control for the majority of patients with or without additional medication, and the visual acuity outcomes were encouraging.

Clinical failure of drainage implants to adequately control IOP is likely to be due to remodelling of the fibrous capsule with thickening, resulting in loss of permeability, diminished aqueous drainage and failure of satisfactory bleb formation. Failure may also be related to alteration of the position of the implant.

The results of this study compare well with other trials using drainage

implants in terms of both IOP control and visual acuity. Importantly, these results were obtained in an Asian population, showing that drainage implants can be successful in this racial group, and were comparable with the success rates achieved in studies of non-Asian patients.

Conclusion

Glaucoma drainage implants are successful in Asian eyes for the treatment of refractory glaucoma. The implants are well tolerated and achieve stable IOP reduction. There is also satisfactory visual stabilisation. *"The role of these implants in Asian eyes for treatment of complicated glaucoma with failed conventional treatment, or for glaucoma unlikely to respond to conventional drainage surgery, indeed is promising."*

Further Reading

1. Aung T, Seah SKL. Glaucoma drainage implants in Asian eyes. *Ophthalmology* 1998;106:2117-2122.

This summary was written by a staff medical reporter.

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