

Glaucoma Tube Shunts

Manuel B. Agulto, MD^{1,2} and Erika Jean A. Salvame, MD²

¹Professor (Retired), Department of Ophthalmology and Visual Sciences
University of the Philippines – Philippine General Hospital, Ermita, Manila

²Department of Ophthalmology, Manila Doctors Hospital, Ermita, Manila

Correspondence: Manuel B. Agulto, MD
Department of Ophthalmology, Manila Doctors Hospital
667 United Nations Ave., Ermita, Manila, 1000
Email: mba_eyemd@yahoo.com

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Tube shunt implantation has generally been reserved for difficult glaucoma cases in which a trabeculectomy has failed or is likely to fail. Trabeculectomy with antifibrotics has been the procedure of choice but over the years there has been an increase in the number of tube shunt implantations.

Indications that would favour the glaucoma surgeon in doing a tube shunt implantation include but are not limited to the following: failed trabeculectomy with antifibrotics, active uveitis, inadequate conjunctiva, aphakia, and contact lens use. Borderline endothelial function is a relative contraindication for anterior chamber placement of a tube.

Devices are generally categorized as either valved, such as the Ahmed, or non-valved, such as the Molteno, and the Baerveldt. There are many designs; each with its own merits and pitfalls. Historically, the Molteno tube was the first device that revolutionized glaucoma tube surgery for refractory glaucoma patients. Shocket tubes are implanted for patients with previous encircling band. Continuous design and material updates have created a better armamentarium for the glaucoma surgeon and improved patient outcomes. Better understanding of Poissuille's formula led to the development of new generation implants such as XEN, MicroShunt, and eyeWatch.

One of the biggest challenges of tube shunt is in the early post-operative course. Hypotony tends to develop since the surrounding bleb of the tube plate offers minimal resistance leading to choroidal hemorrhage and flat anterior chamber. This caused the decrease in the popularity of tubes earlier. But with better understanding of the flow mechanics, this led to placing of sutures to limit flow and the development of valved devices such as the Ahmed. Post-operative IOP spikes (hypertensive phase) from occlusion of non-valved devices are best managed medically. Other complications include diplopia (more common in Baerveldt), hyphema, cataract progression, tube obstruction, plate migration, and tube erosion.

The tube implants are not superior in intraocular pressure (IOP) lowering compared to trabeculectomy. Both are effective in lowering IOP with each procedure has its own set of complications. Surgeon skills and expertise with each operation is an additional factor in choosing which type of surgery.

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