Commentary: Meeting the nemesis of a non-valved glaucoma drainage device head-on

Hypotony is a major issue related to valveless glaucoma drainage devices (GDDs) like the Baerveldt glaucoma implant (BGI) or Aurolab Aqueous Drainage Implant (AADI). Pre-emptive measures for early flow restriction are well described and widely practiced in these types of GDDs, mostly in the form of occlusive temporary polyglactin ligatures and/or use of the intra-luminal ripcord stenting technique. However, once the occlusive ligature autolyzes at around 5–6 weeks, during which a thin plate capsule formation occurs providing resistance to aqueous outflow, there remains a small risk of hypotony thereafter, of 0% to 4.4%.[1,2] Though rare, the consequences of this persistent hypotony can be devastating with shallow anterior chamber (AC), choroidal effusion, hypotony maculopathy and decrease in vision, which may become permanent if prompt management is not instituted. This late hypotony can at times be very difficult to manage, and strategies include either filling up the chamber with one or several injection/s of ophthalmic visco-surgical devices or even C_3F_8 gas, or by manipulating the tube with secondary external ligatures or intra-luminal stenting. External ligatures include those with a repeat of the non-permanent polyglactin occlusive ligature or partial occlusion with permanent 9/0 nylon or prolene. The latter produces inadequate indent, and several ligatures may have to be employed, as described elsewhere for valved tubes.[3] On the other hand, 3/0, 4/0, or 5/0 of the same sutures have also been described for secondary intra-luminal stenting. Of late, 3/0 polyamide (Supramid S. Jackson Inc., Alexandria, VA, USA) is gaining popularity worldwide due to its favorable properties of being firm enough for ab interno stenting. It later swells up to occupy the entire lumen, yet as it is semi-porous, it allows aqueous to pass through,[4] unlike nylon and prolene sutures which are rigid. Some authors have also described the use of the gelatin stent XEN-45 microns (not yet available in India) inserted ab externo into the anterior chamber.[5]

If all else fails, then surgeons do have the option to remove the implant, though this would be at the expense of further damage, by hypertony of an already precarious optic nerve head.

The authors of the current paper[6] have described a novel technique of using the tube of the new microshunt, PreserFlo (Santen Inc., Miami, FL), not yet available in India, considered to be a MIGS-Plus procedure.[7] This implant is a flexible biocompatible microshunt (8.5 mm × 0.350 mm in dimensions with 70 μm lumen) composed of SIBS (poly[styrene-block-isobutylene-block-styrene]). The authors externalized the tube of the BGI via a corneal incision, followed by placement of this microshunt inside the lumen of the BGI ab externo, before replacing the tube-tube complex back into the AC. This manoeuvre led to resolution of the hypotony, whereas it had previously yo-yoed between persistent hypotony when 4/0 prolene intra-luminal stent was used and unacceptable hypertony when 3/0 prolene was used.

Tubes of the PreserFlo microshunt and the XEN-45 are both expensive options for the management of late hypotony in non-valved GDDs. It is unclear why the authors did not consider the use of 3/0 Supramid, which would have been a cost-effective option. Nonetheless, they achieved resolution of hypotony in a resistant case of hypotony following BGI surgery. However, availability of 3/0 polyamide in India (pending commercial release and availability by Aurolabs, Madurai, India) will likely prove to be a game-changer in the management of hypotony in non-valved tubes.

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