Sir,

**Molteno tube obstruction due to viscoelastic after penetrating keratoplasty**

The Molteno implant has been widely used for the management of refractory glaucoma with poor prognosis for filtration surgery.[1] The main indications include neovascular, aphakic or uveitic glaucoma, previously failed filtering surgery, iridocorneal endothelial syndrome, and glaucoma following trauma or keratoplasty.[2] Uveitic glaucoma can also be complicated with band keratopathy and corneal decompensation following cataract extraction, which may require corneal transplantation.[3] We present a case of raised intraocular pressure (IOP) due to retained viscoelastic in a pre-existing Molteno tube after penetrating keratoplasty (PKP).

*Case report*

A 51-year-old man was referred to the glaucoma service for persistently raised IOP (31–58 mmHg despite maximum medical treatment) immediately after left PKP for corneal decompensation and band keratopathy 1 month earlier. His past ocular history included chronic recurrent bilateral anterior uveitis associated with ankylosing spondylitis, secondary chronic glaucoma, and cataract. He had undergone cataract surgery in both eyes, with a posterior chamber implant in the right eye and no implant in the left eye. He subsequently developed intractable glaucoma, which was successfully treated by inserting a double plated Molteno tube in each eye 12 years ago.

On presentation to the glaucoma service, the visual acuity in the left eye was counting fingers, improving to 6/60 with pinhole. The patient was on Acetazolamide 250 mg qid orally, Gut. Teoptic 1% bid, Gut. Prednisolone Forte 1% 2-hourly, and Gut. Latanoprost 0.005% nocte in the left eye. The corneal graft was clear, but the IOP was 42 mmHg and the bleb was domed and hard. No significant anterior uveitis was present, but the few cells present in the anterior chamber were immobile.

A provisional diagnosis of raised IOP due to vitreous obstruction was made and the patient was taken to theatre for left anterior vitrectomy and needling of the bleb with subconjuctival injection of 5-fluorouracil.

During the anterior vitrectomy, performed through a superior limbal incision, it became obvious that the cause of the raised IOP was retained viscoelastic (Healon GV) used during the PKP. The viscoelastic, despite being washed out at the end of the PKP, entered the Molteno system and was occluding it. To evacuate the Healon GV, a stab incision with a microvitreoretinal blade was made into each of the Molteno plates and the viscoelastic released by applying pressure on the plates, as it is illustrated in Figure 1.

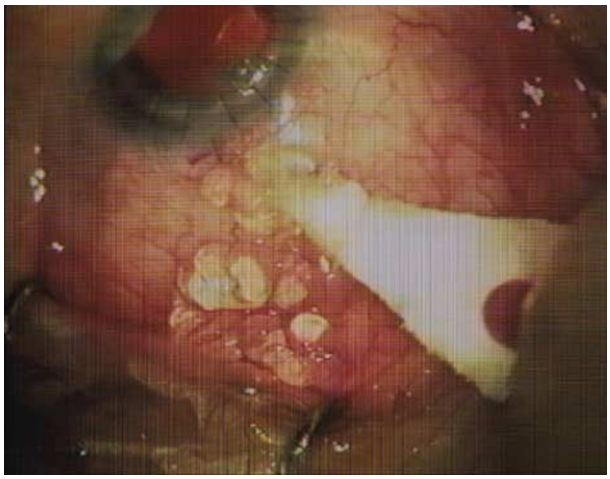

**Figure 1** Release of viscoelastic from the Molteno plate.

The following day the IOP was 4 mmHg and stabilised at 10 mmHg 1 month after the procedure, on no glaucoma treatment.

**Comment**

Molteno implants have been used widely for the management of intractable uveitic glaucoma.[1,2] Reported success rate varies from 75%[4] to 83%,[2] with the most common complications being hypotony, choroidal haemorrage or effusion, hyphaema, tube ostium obstruction, corneal decompensation, phthisis, eroded plate, cataract, retinal detachment, and malignant glaucoma.[4,5]

Patients with chronic glaucoma secondary to anterior uveitis since childhood usually develop cataract and occasionally severe band keratopathy along with pseudophakic bullous keratopathy leading to corneal decompensation.[6] This happens as a consequence of the inflammatory process, combined with previous cataract surgery and the presence of a filtering devices such as the Molteno implant. A PKP may then be indicated to improve the visual acuity and alleviate the irritation of band keratopathy.[3]

In our case, the patient's intractable glaucoma was well controlled for 11 years with the Molteno implant. Immediately after the PKP though, the IOP was persistently high, despite maximum medical topical and systemic treatment. Possible causes of immediate raised IOP after PKP are: rejection, vitreous in the anterior chamber, hyphaema, inflammation, response to steroids, and ghost cell glaucoma.[7] Viscoelastic retention after intraocular procedures is not common, as every effort is usually made to completely remove it at the end of the procedure. In our case, despite an apparent complete removal of Healon GV from the anterior chamber,

viscoelastic entered the Molteno system and obstructed it. Healon GV is an effective cohesive viscoelastic with high molecular weight and high viscosity, which efficiently protects the corneal endothelium, maintains the anterior chamber,[8] and can be removed from the eye[9] without increasing the IOP.[10] Clearly, however, Healon GV can be trapped in the filtering device and obstruct it over the long term, causing grossly raised IOP and subsequent damage to the corneal graft and the optic nerve.

This may be the consequence of either insufficient effort to remove it or because of its preferential entrance into the Molteno implant on first insertion into eye. The viscoelastic can be very slow to degrade, possibly due to low aqueous production.

In conclusion, every effort should be made to ensure that the filtering system is completely free of viscoelastic, especially in the case of cohesive viscoelastics, such as Healon GV.

## References

1 Melamed S, Fiore PM. Molteno implant surgery in refractory glaucoma. *Surv Ophthalmol* 1990; **34**: 441–448.
2 Airaksinen PJ, Aisala P, Tuulonen A. Molteno implant surgery in uncontrolled glaucoma. *Acta Ophthalmol (Copenh)* 1990; **68**: 690–694.
3 Cosar CB, Sridhar MS, Cohen EJ, Held EL, Alvim Pde T, Rapuano CJ. Indications for penetrating keratoplasty and associated procedures, 1996–2000. *Cornea* 2002; **21**: 148–151.
4 Mills RP, Reynolds A, Emond MJ, Barlow WE, Leen MM. Long-term survival of Molteno glaucoma drainage devices. *Ophthalmology* 1996; **103**: 299–305.
5 Lotufo DG. Postoperative complications and visual loss following Molteno implantation. *Ophthalmic Surg* 1991; **22**: 650–656.
6 Cunningham Jr ET. Uveitis in children. *Ocul Immunol Inflamm* 2000; **8**: 251–261.
7 Ayyala RS. Penetrating keratoplasty and glaucoma. *Surv Ophthalmol* 2000; **45**: 91–105.
8 Volker-Dieben HJ, Regensburg H, Kruit PJ. A double-blind, randomized study of Healon GV compared with Healon in penetrating keratoplasty. *Cornea* 1994; **13**: 414–417.
9 Holzer MP, Tetz MR, Auffarth GU, Welt R, Volcker HE. Effect of Healon 5 and 4 other viscoelastic substances on intraocular pressure and endothelium after cataract surgery. *J Cataract Refract Surg* 2001; **27**: 213–218.
10 Burke S, Sugar J, Farber MD. Comparison of the effects of two viscoelastic agents, Healon and Viscoat, on postoperative intraocular pressure after penetrating keratoplasty. *Ophthalmic Surg* 1990; **21**: 821–826.

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*Eye* (2005) **19,** 1342–1343. doi:10.1038/sj.eye.6701762; published online 26 November 2004

Sir,

**Measures to minimise and manage Mersilene mesh complications: remarks on a previously published paper**

I would like to thank Dr Mehta and his colleagues for their article 'Management of Mersilene mesh chronic eyelid complications: a systematic approach' published in the June 2004 issue.[1]

I have been using Mersilene mesh in eyelid surgery since 1993 and I would like to make two comments:

*First*: The authors mentioned some 'steps to minimize Mersilene mesh complications'. These included cutting the mesh 5 mm wide or less, eyelid skin crease stab incision closure, burying the mesh knot well beneath the frontalis muscle, and a postoperative course of systemic antibiotics.

Based on our experience, I would like to add one more step that is very important. The mesh should not touch the eyelid and/or brow skin while being inserted, I believe that the main cause of infection or granuloma formation is the introduction of organisms with the mesh while its being dragged and threaded inside the lid tissues. To avoid that, I first cover the whole area of the lid and brow with 'steri- drape' (3 M Health Care, MN, USA). Through the sterile drape, I make the stab wounds in the lids and brow. I insert the mesh in a double triangle fashion leaving the ends protruding from the brow wounds. Only then did I remove the sterile drape, close the eyelid stab wounds, adjust the level of the lid by pulling the two ends of the mesh, and complete the procedure as usual.

Using this technique, the mesh does not come in contact with the skin and the risk of any organism getting trapped in the mesh spaces is practically eliminated. Consequently, the incidence of infection and/or granuloma formation is markedly reduced.[2]

*Second*: The authors proposed a systematic approach for the management of chronic granuloma and Mersilene