

Ahmed valve glaucoma implant tube shortening procedure

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Abstract

A glaucoma implant is often used for the treatment of refractory glaucoma. Occasionally, the tube in the anterior chamber may be excessively long from excess advancement of the implant when inserted by inexperienced surgeons. The long tube may touch the cornea and lens and may affect the vision if it is beyond the pupillary margin. Shortening the tube requires opening up the conjunctiva and the patch graft covering the extraocular portion of the tube; removing the tube and reinserting it into the anterior chamber. This case report describes an easy technique for shortening an Ahmed valve glaucoma implant tube with excessive length in the anterior chamber. The technique involves intracameral shortening of the tube without removing it from the anterior chamber. This minimizes the risks associated with removal and reinsertion of the tube and removes the necessity for conjunctival dissection and suturing.

Key words: Anterior chamber, Glaucoma drainage implants

Introduction

The Ahmed valve glaucoma implant is often used to lower the intraocular pressure (IOP) for refractory glaucoma.¹ The implant consists of a tube inserted into the anterior chamber attached to a plate placed in the subconjunctival space. The tube is shortened to an appropriate length before being inserted into the anterior chamber. The extraocular part of the tube is covered with human allograft tissues, including dura, pericardium, and donor sclera, to minimize the risk of erosion through the conjunctiva.² However, the shortening may not be precise and the tube can be longer than required. If this is noticed intraoperatively, the tube is usually removed, shortened, and reinserted into the anterior chamber. If the

condition is noticed after the operation, the graft tissue and the conjunctiva over the tube may have already become scarred. To remove the tube for shortening in such circumstances it may be necessary to dissect the conjunctiva and the graft; to resuture a new graft to cover the tube; and to reinsert the tube, which may be difficult. This problem was recently encountered at the Department of Ophthalmology at the United Christian Hospital. A method for shortening the tube without removing it from the anterior chamber is reported.

Case report

A 69-year-old man with primary open-angle glaucoma in the right eye had undergone phacoemulsification with posterior chamber intraocular lens implantation, trabeculectomy, and subsequently had an Ahmed valve glaucoma drainage device implanted. He was referred to the United Christian Hospital because of an excessive length of the glaucoma implant tube in the anterior chamber. The best-corrected visual acuity was 0.1 and the cup-disc ratio was 0.9. His IOP was 18 mm Hg. The portion of the tube inside the anterior chamber was so long that it passed beyond the pupillary margin when the pupil was dilated (**Figure 1**). The condition was not treated for several months and the graft and the conjunctiva over the extraocular portion of the tube was already scarred as far as the sclera. There was no obvious anterior migration of the implant and the bleb was well covered by the upper eyelid.

Surgical technique

The tube was shortened using the technique described below. Topical anesthesia with xylocaine jelly 2% was used. The eye was rinsed with povidone-iodine solution. A 3-mm corneal tunnel was made with a crescent knife over the tube. Another anterior chamber paracentesis wound was made at the 2-o'clock position with a diamond knife. A viscoelastic agent (Healon; Advanced Medical Optics, Santa Ana, USA)

was injected into the anterior chamber. An intraocular lens dialing hook was passed into the anterior chamber through the anterior chamber paracentesis wound and engaged in the lumen of the tube. This served to hold the tube for the scissors to cut (**Figure 2**) and to hold the cut free end of the tube (**Figure 3**). The tube was cut with Vanas scissors passed

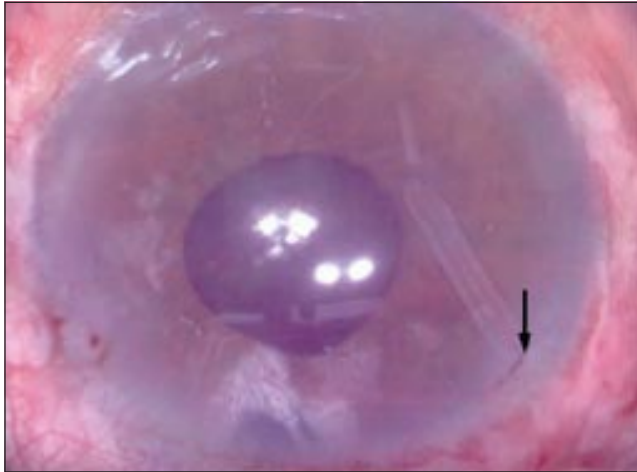


Figure 1. Excessively long Ahmed glaucoma implant tube in the anterior chamber and the corneal incision above the tube (arrow).

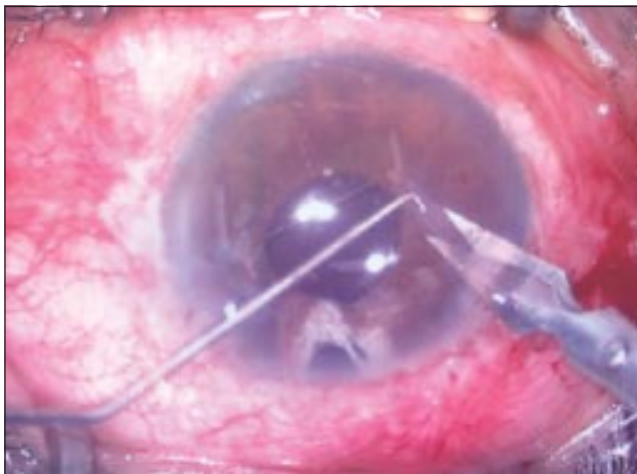


Figure 2. Shortening of the tube with scissors.

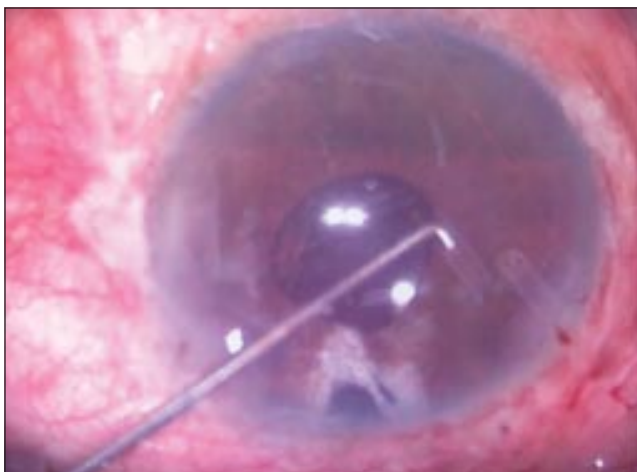


Figure 3. The free end of the tube held with the intraocular lens dialing hook.

through the corneal wound (**Figure 2**). Capsulorrhexis forceps were passed into the anterior chamber to remove the free end of the tube through the corneal wound (**Figures 4 and 5**). The viscoelastic agent was flushed out with balanced salt solution. The corneal wound was self-sealing (**Figure 6**). The surgery was completed within 5 minutes.

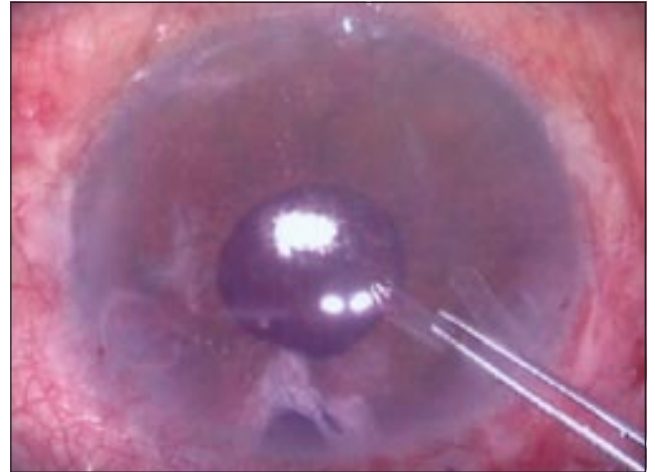


Figure 4. Capsulorrhexis forceps passed through the corneal wound grasping the free end of the tube.

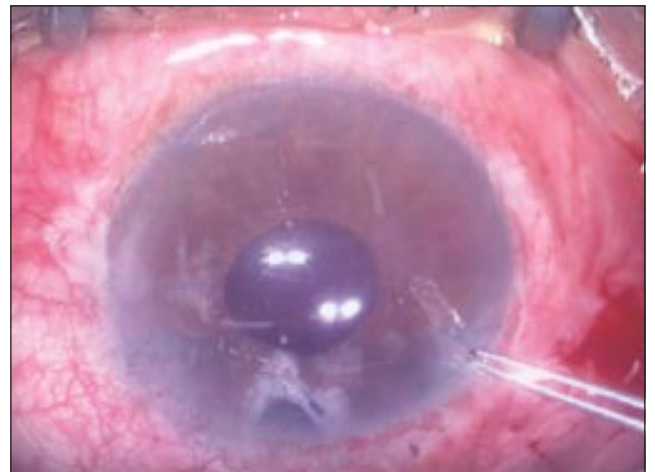


Figure 5. Removal of the cut end of the tube with capsulorrhexis forceps.



Figure 6. Position of the tube after shortening with the self-sealing corneal wound above.

Postoperatively, there was minimal anterior chamber reaction detected. The corneal wound was secured. The visual acuity was the same as that before the procedure. The IOP was 20 mm Hg. No complications were encountered.

Discussion

This technique enables the surgeon to shorten the glaucoma implant tube without removing it from the anterior chamber. The surgery time is significantly reduced without the need to dissect and resuture the conjunctiva and the patch graft, and to reinsert the tube. There is minimal bleeding and hemostasis is not required. Without tissue dissection and bleeding, the surgical trauma is minimal. The risk of infection as a result of reinserting the tube after dissection of

the surrounding tissue is minimal. The self-sealing corneal incision requires no sutures, whereas resuturing would be needed and a new patch graft may also be required if the tube were removed. This would result in a more expensive operation. The length of the tube can be directly assessed in the placement site. The technique can be performed under topical anesthesia as only a corneal incision is made, without dissection of scarred tissues.

The disadvantage of this technique is that the position of the tube cannot be corrected if it is malpositioned in addition to being longer than desired. The tube has to be removed and reinserted using a new stab limbal incision. Also, if there is anterior advancement of the implant, the plate of the implant may need to be explored and refixated posteriorly.

References

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