utilises nightly contact lens wear, but with rigid gas-permeable lenses. Rigid gas-permeable lenses carry a lower risk than soft contact lenses for microbial keratitis,[7] and when used for extended wear only lead to slight and temporary increases in corneal microbial binding.[8] However, despite the use of relatively safer gas-permeable material, orthokeratology utilises flatter, tighter-fitting rigid contact lens design to flatten temporarily the cornea. This may compromise the central corneal surface more than other contact lens designs: in this case and the only other reported case of microbial keratitis [2] the ulcer produced was in the central cornea, where the largest mechanical effect would occur. With the increasing popularity of orthokeratology as a means to correct myopia, treated patients should be warned of, and treating doctors aware of, the risk of keratitis.

References

1 Nichols JJ, Marsich MM, Nguyen M *et al*. Overnight orthokeratology. *Optom Vis Sci* 2000; **77**: 252–259.
2 Chen KH, Kuang TM, Hsu WM. Serratia Marcescens corneal ulcer as a complication of orthokeratology. *Am J Ophthalmol* 2001; **132**: 257–258.
3 Gupta N, Weinreb RN. Filtering bleb infection as a complication of orthokeratology. *Arch Opthalmol* 1997; **115**(8): 1076.
4 Dart JKG, Stapleton F, Minnassian D. Contact lenses and other risk factors in microbial keratitis. *Lancet* 1991; **338**: 650–653.
5 Schien OD, Buehler OP, Stamler JF *et al*. The impact of overnight wear on the risk of contact lens-associated ulcerative keratitis. *Arch Ophthalmol* 1994; **112**: 186–190.
6 Imayasu M, Petroll WM, Jester JV *et al*. The relation between contact lens oxygen transmissibility and binding of *Pseudomonas aeruginosa* to the cornea after overnight wear. *Ophthalmology* 1994; **101**: 371–388.
7 Boswall GJ, Ehlers WH, Luistro A *et al*. A comparison of conventional and disposable extended wear contact lenses. *CLAO J* 1993; **19**: 158–165.
8 Ren DH, Yamamoto K, Ladage PM *et al*. Adaptive effects of 30-night wear of hyper-O_2 transmissible contact lenses on bacterial binding and corneal epithelium. *Ophthalmology* 2002; **109**: 27–40.

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Sir,

Aqueous misdirection following needling of trabeculectomy bleb

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Needling of the glaucoma filtration bleb is increasingly used in the immediate and late post-operative management of glaucoma filtration surgery. Bleb needling has been shown to be effective in both these situations in improving aqueous drainage and lowering intraocular pressure (IOP) with a low complication rate.[1–4]

Although a relatively safe procedure that can be performed in the outpatient setting, it is not without risk of serious complications. Reported adverse events include hypotony with serous choroidal detachment,[5] bleb leak, corneal abrasion, hyphaema, iris incarceration into the sclerostomy, and endophthalmitis.[6]

We describe aqueous misdirection following the needling of a filtration bleb. This is a previously unreported and potentially serious complication of a needling procedure.

Case report

A 70-year-old African-Caribbean lady with advanced refractory open angle glaucoma (highest IOPs right −32 mmHg, left −34 mmHg) on maximal medical therapy underwent left trabeculectomy augmented with mitomycin-C (0.2 mg/ml). Surgery was uncomplicated with a fornix-based conjunctival flap and two releasable scleral flap sutures. Ten years previously she had undergone uncomplicated extracapsular cataract surgery with a 7.00 mm optic size rigid posterior chamber intraocular lens implant.

On day 1 post-operatively, the anterior chamber (AC) was deep with a formed bleb and the IOP was 10 mmHg. At 1 week following surgery the IOP was 23 mmHg and both releasable sutures were removed sequentially over 2 weeks. Despite this intervention, progressive bleb encystment occurred with reduced drainage, bleb injection, and loss of microcysts. At 4 weeks following the surgery the IOP had risen to 26 mmHg.

A needling procedure was performed at the slit-lamp using a 27G needle. The bleb increased in size and the

IOP decreased to 4 mmHg. The AC depth was noted to shallow by 50%. The peripheral iridotomy (PI) was clearly patent and peripheral enough to prevent pupil block. On review the following day the AC was almost flat; however, no corneal-lens implant touch was noted. The IOP remained low at 5 mmHg but the filtration bleb was noted to have decreased in size. Intensive dilation and cycloplegia with G Cyclopentolate 1%, G Phenylepherine 10%, and G Atropine 1% had no effect on AC depth although the IOP rose to 8 mmHg over the next 5 days.

Although the IOP remained stable, subacute aqueous misdirection was suspected. Peripheral capsulo-hyaloidotomy was performed with Nd:YAG laser through the surgical PI. The Nd:YAG aiming beam was focused at and behind the zonules adjacent to the ciliary processes. Sequestered soft lens matter (SLM) from previous extracapsular cataract surgery was visible in the PI. An immediate flow of fluid from the vitreous cavity to the anterior chamber could be seen by observing the movement of particles of sequestered SLM carried in the stream of fluid. The AC deepened within 30 min and had returned to its normal depth the following day. Over the next 2 weeks the IOP rose to 28 mmHg. A further needling procedure was successfully performed in the operating theatre. The IOP remained stable below 18 mmHg during 4 months of follow-up.

Comment

Aqueous misdirection has been associated with most types of intraocular procedure. To our knowledge this has not been previously reported in association with needling of trabeculectomy blebs. Aqueous misdirection should be suspected in cases with shallow AC even before an increase in IOP occurs. It has also been shown that the assessment of IOP in eyes with flat anterior chambers can be inaccurate.[7]

This patient had several risk factors for aqueous misdirection: (1) a short axial length at 21.8 mm; (2) sequestered SLM in the capsular bag obstructing the surgical peripheral iridotomy performed at the time of trabeculectomy; (3) reduction in AC depth from initial transient over drainage following the first needling procedure. These factors led to progressive shallowing of the AC as a result of aqueous misdirection. A reversal of this process was successfully achieved by Nd:YAG laser capsulo-hyaloidotomy.[8]

Although a relatively safe procedure, clinicians should be aware that bleb needling can lead to potentially serious complications including aqueous misdirection, which has not previously been reported.

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References

1 Pederson JE, Smith SG. Surgical management of encapsulated filtering blebs. *Ophthalmology* 1985; **92**: 955–958.
2 Hodge W, Saheb N, Balazsi G *et al*. Treatment of encapsulated blebs with 30-gauge needling and injection of low dose 5-fluorouracil. *Can J Ophthalmol* 1992; **27**: 233–236.
3 Greenfield DS, Miller MP, Suner IJ *et al*. Needle elevation of the scleral flap for failing filtration blebs after trabeculectomy with mitomycin C. *Am J Ophthalmol* 1996; **122**: 195–204.
4 Allen LE, Manuchehri K, Corridan PG. The treatment of encapsulated trabeculectomy blebs in an out-patient setting using a needling technique and subconjunctival 5-fluoracil injection. 1998; **12**(1): 119–123.
5 Potash SD, Ritch R, Liebmann J. Ocular hypotony and choroidal effusion following bleb needling. *Ophthalmic Surg* 1993; **24**(4): 279–280.
6 Mardelli PG, Lederer CM, Murray PL *et al*. Slit-lamp needle revision of failed filtering blebs using mitomycin C. *Ophthalmology* 1996; **103**(11): 1946–1955.
7 Wright MM, Grajewski AL. Measurement of intraocular pressure with a flat anterior chamber. *Ophthalmology* 1991; **98**(12): 1854–1857.
8 Little BC, Hitchings RA. Pseudophakic malignant glaucoma: Nd:YAG capsulotomy as a primary treatment. *Eye* 1993; **7**(Part 1): 102–104.

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Sir,

Systemic side effects of topical latanoprost
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Latanoprost, a prostaglandin analogue (PGF2α), is a commonly used antiglaucoma medication.[1] As plasma concentration is low following topical administration,