Eye (2012) 26, 749–760

www.nature.com/eye

Sir,

The sources of pain during phacoemulsification using topical anesthesia

Phacoemulsification using topical anesthesia is a safe and satisfactory procedure. Minimal pain was reported, but some patients still felt pain.[1–3] To identify the sources of the pain, we encourged the patients to report pain in a 'yes or no' fashion once it was felt, and the exact surgical steps were recorded.

Case report

There were 162 eyes of 136 patients, including 65 males and 71 females. The mean age was 67.3 (SD ± 12.6) years, ranging from 18 to 91 years. Topical anesthesia was achieved by drops of lidocaine hydrochloride (2%) given for three times. Clear corneal incision of 2.65 mm was made, and it was sutured only when needed. The height of balanced salt solution bottle was set around 110 cm above the eye level. The mean operation time was 22 min (SD ± 7.1), ranging from 14 to 52 min. There was no association between the duration of surgery and the pain report. Pain was reported 53 times in 30 (18.5%) operations. The source of pain could be identified in 50 (94.3%) reports (Table 1). We found that younger patients and those with longer eyeball length reported pain more frequently (Table 2). Overall, 26 patients had operations of two eyes separately and the mean duration was 1.7 months (1–5 months). There was no difference in the frequency of pain report between the first or second eye operation ($P = 0.50$, sign test).

Table 1 The steps and identified sources when patients reported pain during phacoemulsification and intraocular lens implantation ($n = 53$)

Source	*Step*	*Pain (%)*[a]
Anterior chamber distention		
	Hydrodissection	2 (3.7)
	Infusion of phaco sculpting[b]	6 (11.3)
	Infusion of phaco segment removal[c]	1 (1.8)
	Infusion of cortex aspiration	11 (20.7)
	Infusion of viscoelastic removal	4 (7.5)
	Total	24 (45.2)
Instrument indenting		
	Lens chop	5 (9.4)
	Cortex aspiration	1 (1.8)
	IOL cartridge forcing into anterior chamber	5 (9.4)
	Total	11 (20.7)
Iris prolapse		
	Iris prolapsing	4 (7.5)
	Iris relocation	2 (3.7)
	Against prolapsing iris[d]	2 (3.7)
	Total	8 (15)
Other		
	Nucleus rotation	2 (3.7)
	Cornea suture	2 (3.7)
	IOL elevation	1 (1.8)
	IOL repositioning	1 (1.8)
	Speculum rotation	1 (1.8)
	Viscoelastic removal[e]	1 (1.8)
	Emulsifying lens segment[e]	2 (3.7)
	Total	10 (18.7)

[a]Number of pain-reports (percentage of all 53 reports).
[b]Infusion step of lens sculpting in phacoemulsification.
[c]Infusion step of lens segment removal in phacoemulsifcation.
[d]Instruments confront against prolapsing iris.
[e]No clear cause could be identified with the pain-report.

Comment

Most of the pain was reported during a smooth operation, and nearly half was reported when the anterior chamber was extended by irrigation, such as too much hydration during hydrodissection, or immediately after the infusion and before the initiation of aspiration in the stages of phacoemulsification, cortex aspiration, or viscoelastic removal. It was relieved by aspiration or lowering the height of the infusion bottle. This result suggests that adequate preoperative setting of the infusion bottle height to avoid over-extension of the anterior chamber can greatly improve the patient's comfort. Particularly in eyeballs with long axial length, whose sclera resistance is less than normal, distention of the anterior chamber is more likely.

Table 2 The distribution of operations with or without pain-reports in different groups by sex, age, diabetes mellitus, and axial length

Variable	*Pain operation (%)*[a]	*No pain operation (%)*[b]	*Total (%)*	*Odds ratio*	P-*value (test)*
Sex					
Female	19 (22)	66 (78)	85 (100)	1.72	0.187 (χ^2)
Male	11 (14)	66 (86)	77 (100)		
Age (years)					
≤65	17 (27)	47 (73)	64 (100)	2.36	0.033[c] (χ^2)
>65	13 (13)	85 (87)	98 (100)		
Diabetes mellitus					
No	26 (19)	108 (81)	134 (100)	1.44	0.789 (Fisher's exact)
Yes	4 (14)	24 (86)	28 (100)		
Eyeball length (mm)					
≥25	9 (47)	10 (53)	19 (100)	5.18	0.0006[c] (χ^2)
<25	21 (15)	122 (85)	143 (100)		
Total	30	132	162		

[a]Operations with pain reported.
[b]Operations without pain reported.
[c]*P*-value <0.05.

Conflict of interest
The authors declare no conflict of interest.

Acknowledgements

Research was conducted using unrestricted departmental and institutional funds.

References

1 O'Brien PD, Fulcher T, Wallace D, Power W. Patient pain during different stages of phacoemulsification using topical anesthesia. *J Cataract Refract Surg* 2001; **27**: 880–883.
2 Yaylali V, Yildirim C, Tatlipinar S, Demirlenk I, Arik S, Ozden S. Subjective visual experience and pain level during phacoemulsification and intraocular lens implantation under topical anesthesia. *Ophthalmologica* 2003; **217**: 413–416.
3 Unal M, Yucel I, Altin M. Pain induced by phacoemulsification performed by residents using topical anesthesia. *Ophthalmic Surg Lasers Imaging* 2007; **38**: 386–391.

C-H Hou[1,2], J-S Lee[1,2], K-J Chen[1,2] and K-K Lin[1,2]

[1]Department of Ophthalmology, Chang Gung Memorial Hospital, Taipei, Taiwan
[2]College of Medicine, Change Gung University, Taoyuan, Taiwan
E-mail: d12093@cgmh.org.tw

Eye (2012) **26,** 749–750; doi:10.1038/eye.2012.29; published online 24 February 2012

Sir,

Comment on 'Idiopathic uveal effusion syndrome causing unilateral acute angle closure in a pseudophakic patient'

I read with interest the above communication by Bhogal *et al*,[1] published recently in the *Eye* journal.

The authors presented images of B scan ultrasound, correctly demonstrating choroidal effusion as the primary trigger in precipitating angle closure glaucoma in their patient. The anterior segment OCT images however failed to show the anatomical mechanism of angle closure, which, in many cases, is caused by the anterior rotation of ciliary body and most probably associated with annular ciliary body detachment. These findings would have been best illustrated by high frequency ultrasound (HFU). The value of HFU in cases of pseudophakic pupillary block and other post-operative ciliary body abnormalities was demonstrated by us in previous publications.[2,3]

Anterior segment OCT is an 'optical scan' and therefore obeys the simple optical principle of inability to penetrate through opaque media. This is the domain of ultrasound. It is tempting to use anterior segment OCT in many clinical situations, as it is noninvasive and easy to use. Anterior segment OCT produces excellent images of the cornea, anterior iris tissue, trans-pupillary lens and angle configuration. It is however inferior to HFU in imaging of the posterior iris surface, ciliary body, posterior chamber, zonules, pars plana and periphery of choroid. An excellent prospective observational case series, comparing anterior segment OCT and HFU in the imaging of anterior segment masses, tend to confirm the above assertion and was published by Pavlin *et al*[4] in 2009.

It is reasonable to recommend to readers that whenever imaging of the ciliary body is desirable, then HFU should remain the technique of choice.

Conflict of interest
The author declares no conflict of interest.

References

1 Bhogal M, Mitry D, Restori M, Subak-Sharpe I. Idiopathic uveal effusion syndrome causing unilateral acute angle closure in a pseudophakic patient. *Eye* 2011; **25**: 1236–1238.
2 Sathish S, Mackinnon JR, Atta HR. Role of ultrasound biomicroscopy in managing pseudophakic pupillary bloc glaucoma. *J Cataract Refract Surg* 2000; **26**: 1836–1838.
3 Srinivasan S, Van Der Hoek J, Green F, Atta HR. Tractional ciliary body detachment, choroidal effusion and hypotony caused by sever anterior lens capsule contraction following cataract surgery. *Br J Ophthalmol* 2001; **85**: 1261–1262.
4 Pavlin CJ, Vasquez LM, Lee R, Simpson ER, Ahmed. Anterior segment optical coherence tomography and ultrasound biomicroscopy in the imaging of anterior segment tumors. *Am J Ophthalmol* 2009; **147**: 214–219.

HR Atta

Ophthalmology Department, Aberdeen Royal Infirmary, Aberdeen, Scotland, UK
E-mail: h.atta@nhs.net

Eye (2012) **26,** 750; doi:10.1038/eye.2012.30; published online 24 February 2012

Sir,

Response to 'Shield or not to shield? Postoperative protection after modern cataract surgery'

We read with interest the correspondence by Lindfield *et al*[1] questioning the necessity for the routine use of shields after small incision cataract surgery following a retrospective review of local practice, and feel that it raises an interesting point. We would, however, request clarification of a potential confounding factor that was not included in the reported data. The authors make no comment regarding the proportion of corneal sections that were sutured. If either group is disproportionately weighted to using corneal sutures, this could either further strengthen or weaken the author's argument.

Secondly, a 2003 ASCRS survey[2] showed that 72% of small incision cataract surgery was performed through a clear corneal section with only 28% through a scleral tunnel (no UK data available). The cohort of Lindfield *et al*[1] had a disproportionately high percentage of scleral tunnel patients compared with likely current standard practice.