

In our case, the reflective nature of the slit-lamp observed debris was suggestive of metallic origin, which did not seem to affect the visual outcome in 18 months follow up. Confocal microscopy was not available. In the future, femtosecond laser technology may provide thinner, better quality grafts and in addition will avoid microkeratome-related interface debris.

#### Conflict of interest

The authors declare no conflict of interest.

#### References

- 1 Suh LH, Yoo SH, Deobhakta A, Donaldson KE, Alfonso EC, Culbertson WW *et al.* Complications of Descemet's stripping with automated endothelial keratoplasty: survey of 118 eyes at One Institute. *Ophthalmology* 2008; **115**: 1517–1524.
- 2 El Danasoury MA, El Maghraby A, Klyce SD, Mehrez K. Comparison of photorefractive keratectomy with excimer laser in situ keratomileusis in correcting low myopia (from 2.00 to 5.50 diopters). A randomised study. *Ophthalmology* 1999; **106**: 411–420.
- 3 Kymionis GD, Kontadakis GA, Agorogiannis GI, Bennett M, Angelidou F. Descemet stripping automated endothelial keratoplasty combined with phacoemulsification in Chandler syndrome. *Eur J Ophthalmol* 2011; **21**: 495–497.
- 4 Kymionis GD, Ide T, Yoo SH. Interface wavelike deposits after descemet stripping automated endothelial keratoplasty. *Arch Ophthalmol* 2009; **127**: 1389–1390.
- 5 Kobayashi A, Mawatari Y, Yokogawa H, Sugiyama K. *In vivo* laser confocal microscopy after descemet stripping with automated endothelial keratoplasty. *Am J Ophthalmol* 2008; **145**: 977–985.

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#### Sir, Serum C-reactive protein levels in exfoliation syndrome and exfoliative glaucoma

Exfoliation syndrome (XFS) is a systemic disorder of the extracellular matrix characterized by the accumulation of

elastic microfibrils in which oxidative stress and a chronic low-grade inflammation is implicated in the pathogenesis.<sup>1–3</sup> The purpose of this study was to evaluate the serum concentrations of CRP, a marker for systemic inflammation, in subjects with XFS and exfoliative glaucoma (XFG).

#### Case report

A total of 33 exfoliative subjects (14 subjects with XFG and 19 subjects with XFS) with a mean age of  $69.5 \pm 11.6$  years and 23 age-matched (mean age =  $67.3 \pm 10.5$  years) control subjects were included in this study. A minimum sample size of 18 subjects was required to detect a clinically meaningful difference of 0.5 mg/dl with an alpha error of 0.05 and power of 0.90. Serum CRP levels were determined using nephelometric assay. The mean serum CRP level of subjects with exfoliation ( $0.54 \pm 0.46$  mg/dl) (XFS + XFG combined) was not significantly different ( $P = 0.274$ ) than that of healthy subjects ( $0.42 \pm 0.28$  mg/dl). In addition, the mean age, gender ratio, and serum CRP concentrations were similar between subjects with XFS, XFG, and controls (Table 1). Coronary artery disease and hypertension was present in 15.2% and 27.2% of exfoliative patients, respectively (Table 1).

#### Comment

The interaction of co-pathogenetic mechanisms such as oxidative stress, tissue hypoxia, and release of growth factors (ie, TGF- $\beta$ 1) is believed to be associated with chronic low-grade inflammation and propensity to excessive inflammation following intraocular procedures associated with breakdown of the blood-aqueous barrier.<sup>1,2</sup> The presence of inflammation in XFS has been further substantiated by elevated aqueous interleukin-6 levels in early stages of XFS and the identification of C1q component of the complement system within the microfibrillar aggregates.<sup>3,4</sup> In addition, XFS has been shown to be correlated with age-related macular degeneration, another disorder with underlying inflammatory mechanisms in which serum CRP levels have been found to be elevated.<sup>5</sup>

Our results revealed that serum CRP levels were not elevated in patients with XFS and XFG. In a recent study, serum levels of CRP in XFS and XFG were found to be similar to that of healthy controls.<sup>6</sup> In that study, all subjects with a history of vascular disease including hypertension and coronary artery disease were excluded; however, exclusion of subjects with vascular disease may potentially be representative of patients with a milder phenotypic disorder. Nonetheless, on the basis of our results and those of Yuksel *et al*,<sup>6</sup> we suggest that XFS-

**Table 1** Clinical parameters and serum CRP concentrations in different groups included in the study

Parameter	Group I (XFS) (n = 19)	Group II (XFG) (n = 14)	Group III (N) (n = 23)	Test	P
Age (years)	69.4 ± 13.3	69.8 ± 9.3	67.3 ± 10.5	ANOVA	0.449
Gender (F/M)	8/11	7/7	14/9	$\chi^2$	0.377
CRP (mg/dl)	0.53 ± 0.38	0.55 ± 0.57	0.42 ± 0.28	ANOVA	0.549
CAD	2 (10.5%)	3 (21.4%)	1 (4.3%)	Fisher's exact test	0.308
HT	5 (26.3%)	7 (50.0%)	2 (8.7%)	Fisher's exact test	0.025

Abbreviations: CAD, coronary artery disease; CRP, C-reactive protein; HT, hypertension; N, normal; XFG, exfoliative glaucoma; XFS, exfoliation syndrome.

associated inflammation is not able to induce hepatic synthesis of CRP and is associated with a limited local and subclinical inflammatory reaction in involved tissues.

#### Conflict of interest

The authors declare no conflict of interest.

#### References

- 1 Schlotzer-Schrehardt U. Molecular pathology of pseudoexfoliation syndrome/glaucoma—new insights from LOXL1 gene associations. *Exp Eye Res* 2009; **88**(4): 776–785.
- 2 Koliakos GG, Befani CD, Mikropoulos D, Ziakas NG, Konstas AG. Prooxidant-antioxidant balance, peroxide and catalase activity in the aqueous humour and serum of patients with exfoliation syndrome or exfoliative glaucoma. *Graefes Arch Clin Exp Ophthalmol* 2008; **246**(10): 1477–1483.
- 3 Zenkel M, Lewczuk P, Kruse FE, Junemann AG, Schlotzer-Schrehardt U. Increased levels of interleukin-6 in the aqueous humor of patients with early stages of pseudoexfoliation syndrome/glaucoma. *ARVO Abstract* 2007; **48**: 5899.
- 4 Ovodenko B, Rostagno A, Neubert TA, Shetty V, Thomas S, Yang A *et al.* Proteomic analysis of exfoliation deposits. *Invest Ophthalmol Vis Sci* 2007; **48**(4): 1447–1457.
- 5 Seddon JM, Gensler G, Milton RC, Klein ML, Rifai N. Association between C-reactive protein and age-related macular degeneration. *Jama* 2004; **291**(6): 704–710.
- 6 Yuksel N, Pirhan D, Altintas O, Caglar Y. Systemic high-sensitivity C-reactive protein level in pseudoexfoliation syndrome and pseudoexfoliation glaucoma. *J Glaucoma* 2010; **19**(6): 373–376.

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#### Sir, Congenital glaucoma: still a clinical challenge

It was with interest that I read the article on the results of combined trabeculotomy and trabeculectomy in Ghana published recently in your journal.<sup>1</sup> Congenital glaucoma is a clinical challenge for any ophthalmologist, and requires a long-term commitment toward these patients with extended care for rehabilitating these children.<sup>2,3</sup> Hence, this article holds importance in serving as a baseline for the entire West African region, which is important to decide management strategies to cope with childhood blindness in that place.

The authors have correctly pointed out that their poor 1 year success of 44% may be due to severe disease at presentation, racial and genetic influences, and also non-use of mitomycin-C.<sup>2–4</sup> Yet, it was surprising that 63% of the children had diffuse avascular blebs, which raises the question of how many persons graded the blebs and evaluated the patients postoperatively. The authors state that three patients had normal intraocular pressure

(IOP); one on medication and two others with IOP taken under anesthesia. Yet, the cutoff for surgical success has been taken as 21 mm Hg. It is not clear whether this the cutoff has been maintained for infants examined under anesthesia, which would be inappropriate, taking into consideration the lowering of IOP in deeper planes of anesthesia.

Visual rehabilitation is an important aspect of childhood glaucoma, a dimension that has been totally ignored in this article. It would be worthwhile if the authors include information on the visual acuity obtained postoperatively in at least some patients and the reason for poor vision, such as Haab striae, refractive errors, amblyopia, or others.

Although we understand the non-availability of Perkins tonometer at all times in the operating room, it is advisable to exclude IOP readings taken with Schiotz, as that might give erroneous results in children with corneal edema and buphthalmic eyes.

Studies such as these highlight the challenges faced while treating childhood glaucoma. Consideration of these points has to be kept in mind when we analyze the surgical outcomes in these patients.

#### Conflict of interest

The author declares no conflict of interest.

#### References

- 1 Essuman VA, Braimah IZ, Ndanu TA, Ntim-Amponsah CT. Combined trabeculotomy and trabeculectomy: outcome for primary congenital glaucoma in a West African population. *Eye* 2011; **25**: 77–83.
- 2 Mandal AK, Gothwal VK, Nutheti R. Surgical outcome of primary developmental glaucoma: a single surgeon's long-term experience from a tertiary eye care centre in India. *Eye* 2007; **21**: 764–774.
- 3 Mandal AK. Long-term surgical and visual outcomes in Indian children with developmental glaucoma operated on within 6 months of birth. *Ophthalmology* 2004; **111**: 283–290.
- 4 Dietlein TS, Jacobi PC, Kriegelstein GK. Prognosis of primary ab externo surgery for primary congenital glaucoma. *Br J Ophthalmol* 1999; **83**: 317–322.

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#### Sir, Response to Dr Rao

We would like to thank Dr A Rao<sup>1</sup> for the comments and questions raised regarding the article 'Combined trabeculotomy and trabeculectomy: outcome for primary congenital glaucoma in a West African population'.<sup>2</sup> As she rightly pointed out, our article highlights some of the challenges in the care of children with congenital glaucoma in the developing world. We would want to respond to some of the concerns raised in her letter.