Silicone IOL Biocompatibility—Not All Silicone Is the Same

In their recent paper, Chang and coauthors[1] suggest that silicone lenses should be avoided in phacotrabeculectomy on the basis of their retrospective study of cellular precipitates on intraocular lens (IOL) surfaces. Their finding of statistically increased giant cell precipitates on plate-haptic silicone IOLs (Chiron C10UB) compared with poly(methyl methacrylate) (PMMA) is consistent with the findings of a 1998 randomized study by Hollick and coauthors[2] comparing a 3-piece silicone IOL (Iolab L141U) with a PMMA lens.

At first glance, these findings seem to be contradicted by 2 prospective randomized specular microscopy studies[3,4] that show epithelioid cell deposits on silicone IOLs to be almost zero and far lower than on PMMA IOLs. These latter studies examine the Allergan SI-30 3-piece silicone IOL. The Samuelson and coauthors phacotrabeculectomy study,[5] which the authors cite in their article, offers an explanation of this discrepancy. This single-surgeon randomized study of 3 IOL types showed that first-generation silicone plate-haptic IOLs (Chiron C10/C11) had the greatest number of giant cell deposits, while the second-generation silicone IOLs (Allergan SI-30/SI-40) had the fewest. The Alcon AcrySof® was in between. Collectively, all 5 studies suggest that second-generation silicone material (e.g., SI-30), with its higher refractive index and thinner optic, is more biocompatible than first-generation silicon material (e.g., C10UB, L141U).

The same dichotomy has been shown in the posterior capsule opacification (PCO) rate of different silicone IOLs. In randomized studies using photographic comparisons, first-generation silicone (Iolab L141U) was statistically inferior to the AcrySof IOL,[6] while second-generation silicone (SI-30 IOL) was statistically superior to PMMA and equal to the AcrySof in terms of PCO reduction.[7,8] Clearly, it is inaccurate and confusing to categorize all silicone materials and designs together. The conclusions of this most recent study should be limited to first-generation plate-haptic silicone rather than to all silicone IOLs.

DAVID F. CHANG, MD
Los Altos, California, USA

References

1. Chang BYP, Loh R, Savides R, Atkins DA. Incidence of anterior intraocular lens precipitates after combined phacotrabeculectomy. J Cataract Refract Surg 2000; 26:398–401
2. Hollick EJ, Spalton DJ, Ursell PG, Pande MV. Biocompatibility of poly(methyl methacrylate), silicone, and AcrySof intraocular lenses: randomized comparison of the cellular reaction on the anterior lens surface. J Cataract Refract Surg 1998; 24:361–366
3. Ravalico G, Baccara F, Lovisato A, Tognetto D. Postoperative cellular reaction on various intraocular lens materials. Ophthalmology 1997; 104:1084–1091
4. Hollick EJ, Spalton DJ, Ursell PG. Surface cytologic features on intraocular lenses. Arch Ophthalmol 1999; 117:872–878
5. Samuelson TW, Chu Y, Kreiger RA. Evaluation of giant-cell deposits on foldable intraocular lenses after combined cataract and glaucoma surgery. J Cataract Refract Surg 2000; 26:817–823
6. Hollick EJ, Spalton DJ, Ursell PG, et al. The effect of polymethylmethacrylate, silicone and polyacrylic intraocular lenses on posterior capsule opacification three years after cataract surgery. Ophthalmology 1999; 106:49–55
7. Hayashi H, Hayashi K, Nakao F. Quantitative comparison of posterior capsule opacification after polymethylmethacrylate, silicone and soft acrylic intraocular lens implantation. Arch Ophthalmol 1998; 116:1579–1582
8. Olson RJ. Is there truly a clinical difference in intraocular lenses available today? Comp Ophthalmol Update 2000; 1:19–28

Reply: We thank Dr. David Chang for his interest in our article. We agree that the conclusion of this study is limited to the first-generation plate silicone intraocular lens that was used in this study—*B.Y.P. Chang, FRCOphth*

Intraocular Lens Fixation

Drs. Amino and Yamakawa have demonstrated a long-term increase in anterior chamber flare in the presence of sulcus-fixated intraocular lenses (IOLs).[1] This applies also to IOLs sutured to the sclera in the region of the ciliary sulcus, as explicitly stated by the authors. Iris contact with the IOL optic is regarded as the main cause of this chronic irritation.

Pars plana fixation of sutured IOLs[2,3] could prevent iris-IOL contact. It has the additional advantage of avoiding penetration of the richly vascularized tissue of the ciliary sulcus with a needle.

I think that it is time to challenge the traditional approach to scleral fixation and explore once more the originally suggested (and anatomically sound) fixation site.[4]

KLAUS D. TEICHMANN, FRCSC, FRACO
Jeddah, Kingdom of Saudi Arabia