Case Report

Pigment deposits on hydrophilic intraocular lenses after phacoemulsification cataract surgery

Bruno Zuberbuhler, PhD a,b, Gianluca Carifi, MD c,*

Abstract

A heterogeneous group of conditions can cause changes to the intraocular lens (IOL) during or after implantation in uneventful cataract surgery. We describe a series of 5 patients presenting distinctive deposits on the surface of hydrophilic intraocular lenses, implanted during routine cataract surgery, with a follow-up of 1 to 24 months. Disposable forceps were found to be the source of the pigmented marks when used to hold the lens during the injector loading process. At the slit-lamp examination, the pigments were located in the centre of the lens optic, easily detectable. Although involving the visual axis, none of the patients were visually affected. To our knowledge, this is the first time such unusual occurrence has been described. The reported case-series shows the importance of in-house follow-up after cataract surgery.

Keywords: IOL deposits, Intraocular lenses, Cataract surgery, IOL, Hydrophilic IOL

Introduction

A heterogeneous group of conditions can cause changes to the intraocular lens (IOL) during or after implantation in uneventful cataract surgery, including fibrin and membrane formation, deposits from lens epithelial cell migration, brown pigmentation in patients with uveitis, changes in the lens optic due to calcification, and lens damages from the injecting process and other manipulations of the lens after implantation, presenting with scratches, folds or impressions. Some of the changes are temporary and might disappear after adequate treatment; others remain and can cause visual disturbances, such as halos, stars and blurred vision. In cases of severe lens opacification it is required, instead, explantation of the IOL.

We report on a series of 5 patients who showed deposits on the surface of the IOL optic after uneventful routine phacoemulsification with the implantation of hydrophilic acrylic IOLs.

Case reports

The first three patients underwent successful cataract extraction and implantation of a Rayner C-flex 970C IOL. The first, aged 77, underwent cataract surgery 9 months ago. The IOL showed multiple small crystalline deposits on the anterior surface of the IOL. His corrected distance visual acuity (CDVA) was 0.10 LogMAR. A second 65-year-old woman presented multiple white and shiny linear deposits on the anterior and posterior IOL surfaces at the 1 month review...
(Fig. 1), CDVA was 0.10 LogMAR. The third patient was an 82-year-old man seen 5 months after cataract surgery. On examination his IOL was scattered with multiple small white pigments; CDVA was 0.00 LogMAR. The other two patients were implanted with a Bausch&Lomb Akreos-AO IOL. An 80-year-old man seen in a glaucoma clinic 2 years after cataract surgery presented with three faint linear crystalline changes on the anterior and posterior IOL surfaces. His CDVA was 0.32 LogMAR. The last patient was a 77-year-old woman. At a routine follow-up 6 months after surgery two separate bands with small silver pigments, one on the anterior and one on the posterior surface of the lens optic (Fig. 2), were detectable. Her unaided distance visual acuity was 0.02 LogMAR. None of the 5 patients complained of visual symptoms; and none of the patients had intra- or post-operative complications. All patients were operated at a high volume cataract centre at the Manchester Royal Eye Hospital.

**Discussion**

Changes on, or in the lens optic are rare events, and therefore even more interesting when seen in a group of patients over a short period. Although we initially thought that these changes evolved from the lens itself, we soon realised that the changes were deposits on the anterior and posterior lens surface, sparing the lens material and keeping it clear. The finding of silver pigments in the paracentesis of one of our cataract patients brought us on the right track, and we soon identified a set of disposable, non-toothed, 45° angled loading forceps being responsible for these markings (Malosa Medical Ltd., United Kingdom). Microscopic examination of the forceps revealed identical silver particles on the inner side of the tips (Fig. 3), material that resembled the coating of the instrument.

Although the general recommendation is to avoid grasping the IOL optic with surgical instruments, the loading technique sometimes dictates to use forceps to take the IOL out from the holding unit (Akreos) or container (Rayner) and to place it into the cartridge of the injector with mild pressure.

Interestingly, at our cataract centre, the same forceps were also used during the loading of hydrophobic acrylic Alcon SN60AT IOLs into the B-Cartridges, but no marks were found. In our cases, this marking was linked to hydrophilic acrylic IOLs only.

Generally, we were surprised to see that tiny particles can be released by surgical instruments and adhere firmly on the surface of IOLs and to ocular tissue. The reasons for using disposable instruments are the lower risk of cross infection and lower cost solution than re-sterilisation of re-usable instruments. The increase in cost-effectiveness might consequently put pressure on instrument manufacturers to innovate in the design of surgical tools and be able to produce with lower costs. However, quality standards should always be a basic prerequisite. In our case, the described forceps were replaced and the manufacturer is now producing a new model of the forceps, not causing the marks anymore.

**Figure 1.** Detail of a hydrophilic IOLs displaying characteristic and reflective deposits arranged in a particular mold configuration, on both surfaces.

**Figure 2.** The glittering deposits detectable on the front and back surfaces of this hydrophilic IOL correspond to the area of contact between the branches of the forceps used during the loading of the injector.

**Figure 3.** The 45° angled loading forceps used at our centre and found responsible for the release of the IOL deposits.
In conclusion, it is useful to follow-up patients in-house after cataract surgery, as this can guarantee the identification of outcome changes, especially when they are very subtle and not noticeable by the patient. This allows addressing promptly any problem might arise, in our case by replacing the faulty equipment.

References


