LETTERS TO THE EDITOR

Managing Descemet Detachment in Femtosecond Laser-Assisted Cataract Surgery: The Isolate-and-Release Technique

To the Editor:

Descemet detachment in cataract surgery can compromise visual results and implicate the need for more surgical procedures. Since 2009, when femtosecond laser-assisted cataract surgery (FLACS) was first introduced, only one case of Descemet detachment has been reported in a study assessing intraoperative complication rates, and it is not clear whether the detachment was caused by the laser or in the operating room. We describe four cases of this complication in FLACS and the isolate-and-release technique to successfully manage it.

Four patients with a mean age of 70.3 ± 5.1 years (range: 65 to 77 years) had localized Descemet detachment during FLACS with the LenSx laser system (Alcon Laboratories, Inc., Fort Worth, TX) (Figure A, available in the online version of this article). Three detachments occurred when the laser was performing the secondary incision and one occurred during the primary incision creation. The patients had no previous ocular surgeries. Their mean central pachymetry was 549.8 ± 27.6 µm (range: 522 to 588 µm). Their mean endothelial cell density was 2,084 ± 261.5 cells/mm$^3$ (range: 1,771 to 2,381 cells/mm$^3$). One patient had mild guttae.

The factors that increase the risk of Descemet detachment in FLACS have not been determined. Endothelial disease, as seen in one of our patients, may play a role because it is a risk factor in conventional cataract surgery. Age older than 65 years can also be implicated. Although excessive laser energy and device miscalibration may be involved, we were using our routine laser parameters and the laser presented no abnormality in calibration tests. In all cases, the laser started firing normally in the anterior chamber and the detachment occurred right after the laser was applied in the corneal internal surface. None of the detachments extended to the corneal central part (Figure A).

In the operating room, the isolate-and-release technique was used (Figure B, available in the online version of this article; Video 1, available in the online version of this article), which consists of first opening the incision not affected by the Descemet detachment and filling the anterior chamber with ophthalmic viscosurgical device to increase intracameral pressure and isolate the detached part of the Descemet membrane. This prevents the trapped bubbles from moving inadvertently and dissecting the Descemet membrane more. Then, the incision with the detachment is opened with a spatula. As soon as the internal part of this incision is opened, the increased intracameral pressure causes bubbles to be released from the eye, and the detachment cannot be seen in the microscope or its limits can only be barely seen. The phacoemulsification and intraocular lens implantation occurred uneventfully in all cases. The corneas were clear on the first postoperative day and anterior segment optical coherence tomography showed resolution of the detachments within 30 days.

Descemet detachment can occur in FLACS and is usually localized, not extending to the central cornea when properly managed. Identifying and appropriately dealing with this complication is key to decrease the risk of poor postoperative visual results. The isolate-and-release technique is effective in dealing with this complication, avoiding further ocular damage.

REFERENCES


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Figure A. Descemet detachments in femtosecond laser-assisted cataract surgery. Case 1. (A) Screenshot of the femtosecond laser display at the end of the laser treatment evidencing the localized Descemet detachment adjacent to the secondary incision (white arrow) and (B) intraoperative photograph showing the Descemet detachment (white arrow), which is smaller than the detachment at the end of the laser treatment due to partial bubble reabsorption. Although the bubbles causing the detachment are partly absorbed between the laser room and the operating room, resulting in a decrease in the visually distinguishable margins of the detachment, the gas has already created a cleavage plane between the Descemet membrane and the stroma, resulting in an area more prone to Descemet detachment progression. Case 2. (C) Screenshot of the femtosecond laser display at the end of the laser treatment evidencing the localized Descemet detachment adjacent to the secondary incision (white arrow). Case 3. (D) Screenshot of the femtosecond laser display at the end of the laser treatment evidencing two small Descemet detachments, one at each internal corner of the primary incision (white arrows). (E) Anterior segment optical coherence tomography image showing the Descemet detachment on the first postoperative day in case 1 (8-mm scan length).

Figure B. Intraoperative photographs of case 1 showing the isolate-and-release technique. (A) The incision not affected by the Descemet detachment is opened first. (B) The anterior chamber is filled with ophthalmic viscosurgical device, increasing intraocular pressure and isolating the area of detached Descemet membrane. (C) The incision with the Descemet detachment is then opened with a spatula. (D) When the spatula opens the internal part of the incision with the Descemet detachment, gas bubbles leave the eye (white arrow) and the detachment’s limits can only be barely seen.