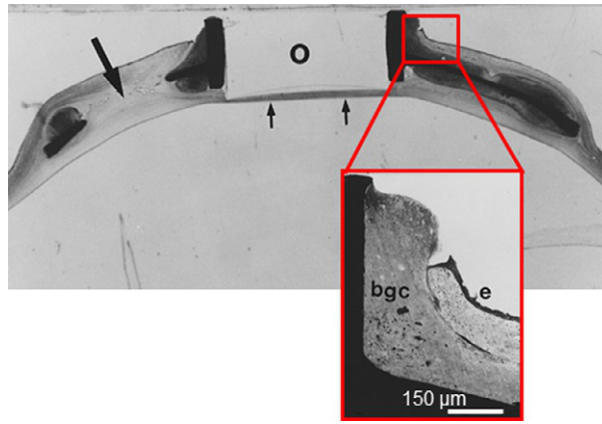

FIG. 13.7 Histological pictures of rabbit eye with a keratoprosthesis supported by a titanium flange coated with an A/W glass-ceramic. Main image: the small arrows point to the intact aspect of the cornea under the optical element "O," whereas the large arrow points to the hole in the left half of the supporting flange. Inset: there is a tight contact between the A/W glass-ceramic coating and the corneal matrix tissue, while the corneal epithelium "e" shows no ingrowth but has attached to the bioactive glass-ceramic (bgc) A/W coating on the part supporting the optical element. *Images adapted from Linnola, R.J., Happonen, R.P., Andersson, O.H., Vedel, E.A., Yli-Urpo, U., Krause, U., Laatikainen, L., 1996. Titanium and bioactive glass-ceramic coated titanium as materials for keratoprosthesis. Exp. Eye Res. 63, 471–478 © Academic Press Limited.*

prosthesis rim into the anterior chamber of the eye. Despite this positive effect, problems of coating dissolution and detachment from the metal substrate were observed, and therefore the studies were discontinued.

Bioactive glass-based coatings could find high-impact applications in the prevention of implant-related ocular infections, the treatment of which is often stressful and expensive to patients. Interestingly, there is a paucity of ocular biomaterials and implants provided with antiseptic properties (Anaya-Alaminos et al., 2015), and infections continued to be routinely treated by the administration of systemic or local antibiotics.

A new approach to combat bacterial issues in ophthalmology was recently proposed by Ye et al. (2014) who coated porous hydroxyapatite orbital implants with a layer of Cu-doped mesoporous bioactive glass (MBG) produced by the sol-gel method (Fig. 13.8). The coating, containing up to 5 mol.% of CuO, was prepared by dipping the ceramic implant into the sol; the material was then dried and calcinated, and ofloxacin was incorporated into the coating mesopores. The antibacterial effect was elicited by the release of both drug molecules and Cu^{2+} ions during MBG dissolution. Early antibacterial in vitro tests against *Staphylococcus aureus* and *Escherichia coli* (Gram-positive and Gram-negative bacterial strains) validated the twofold antiseptic effect of the proposed system, thus opening novel perspectives for the prevention and treatment of implant-related infections.