

# **Ex vivo multiphoton analysis of rabbit corneal wound healing following conductive keratoplasty**

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摘要

## **Abstract**

Ex vivo multiphoton imaging is used to characterize rabbit corneal wound healing after conductive keratoplasty (CK) procedures. CK is performed on the right eyes from eight New Zealand albino rabbits while the left eyes are punctured by a keratoplast tip without energy application. Rabbits are humanely sacrificed 1 day, 1, 2, and 4 weeks after the CK procedure. Eye balls are enucleated and placed on the microscope for multiphoton imaging. Multiphoton imaging reveals damage of corneal epithelium and stroma caused by the CK procedure and the subsequent wound healing process can be followed without histological procedures. Multiphoton excited autofluorescence images demonstrate that re-epithelialization is accomplished within 1 week in both CK and control groups. However, epithelial hyperplasia is observed in CK corneas. In addition, stromal wounds in the control group become inconspicuous within 1 week while obvious wounds still exist in CK corneas for at least 4 weeks. Postconductive keratoplasty corneal damage and wound healing can be characterized by multiphoton microscopy without histological procedures. Our results suggest that multiphoton microscopy has potential in the clinical evaluation of corneal damage due to refractive surgery, and can be used to study and reduce the unwanted side effects of these procedures