

Comparison of the Morphologic Changes after Selective Laser Trabeculoplasty and Argon Laser Trabeculoplasty in Human Eye Bank Eyes

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Objective: To compare the histopathologic changes in the human trabecular meshwork (TM) after argon laser trabeculoplasty (ALT) and selective laser trabeculoplasty (SLT) with a Q-switched, frequency-doubled, neodymium:yttrium–aluminum–garnet laser.

Design: Human “in vitro” experimental study.

Tissue and Controls: Eight human autopsy eyes were obtained within 18 hours of death from persons aged 71 to 78 years.

Methods: The anterior segment of autopsy eyes was isolated, and one half of each trabecular meshwork underwent SLT and the other half ALT. Specimens were evaluated with scanning and transmission electron microscopy.

Main Outcome Measures: Structural changes in the TM were detected by scanning electron microscopy, and cellular or intracellular changes were seen with transmission electron microscopy.

Results: Evaluation of the TM after ALT revealed crater formation in the uveal meshwork at the junction of the pigmented and nonpigmented TM. Coagulative damage was evident at the base and along the edge of craters, with disruption of the collagen beams, fibrinous exudate, lysis of endothelial cells, and nuclear and cytoplasmic debris. Evaluation of the TM after SLT revealed no evidence of coagulative damage or disruption of the corneoscleral or uveal trabecular beam structure. Minimal evidence of mechanical damage was present after SLT, and the only ultrastructural evidence of laser tissue interaction was cracking of intracytoplasmic pigment granules and disruption of trabecular endothelial cells.

Conclusions: SLT applied “in vitro” to the TM of human eye bank eyes seemed to cause no coagulative damage and less structural damage to the human TM when compared with ALT and, therefore, may be a safer and more repeatable procedure. *Ophthalmology* 2001;108:773–779 © 2001 by the American Academy of Ophthalmology.
