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Histologic changes following continuous and micropulse transscleral cyclophotocoagulation: a comparative study

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Purpose/Relevance:

To report the macroscopic and microscopic anatomical changes of treatment with micropulse transscleral cyclophotocoagulation (MPTCP) and to compare these changes to those of treatment with conventional transscleral cyclophotocoagulation (TCP).

Methods:

3 pairs of adult eyes were obtained from the Minnesota Lions Eye Bank and harvested within 36 hours after death. Superior and inferior halves of each eye were randomly assigned to control, TCP, single MPTCP treatment, or double MPTCP treatment. Four-micron thick sections, with 100 micron intervals, were stained with hematoxylin and eosin. Histologic features were scored as present or absent for each level. The features evaluated are: A) split between the non-pigmented and pigmented ciliary body epithelium, B) separation of pigmented ciliary body epithelium from the stroma, C) coagulation of collagen and destruction of ciliary body stroma, and D) destruction of ciliary body epithelium (Figure 1).

Results:

A total of 498 sections were analyzed. The laser scars in all treated specimens were found in the pars plana. Split between the non-pigmented and pigmented ciliary body epithelium occurred at similar rates amongst the four groups ($p=0.188$). Separation of the pigmented ciliary body epithelium from the stroma occurred only in TCP and double MPTCP-treated sections. Coagulation of collagen and destruction of ciliary body stroma occurred much more commonly in the TCP, single MPTCP-, and double MPTCP-treated sections, however logistic regression analysis showed the rate of occurrence of this feature was significant only in the TCP-treated group relative to control ($P=0.002$). Destruction of the ciliary body epithelium occurred exclusively in TCP-treated sections.

Discussion:

Destruction of the ciliary body epithelium is unique to TCP-treated eyes, while separation of the pigmented ciliary body epithelium from the stroma occurs in both MPTCP- and TCP-treated eyes.

Conclusion:

MPTCP and TCP treatment produces unique histologic changes in cadaver eyes that are more pronounced in TCP-treated eyes compared to MPTCP-treated eyes. These findings may help explain the increased rate of adverse effects following TCP treatment compared to MPTCP in living eyes.

References:

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Category:
Surgery