

In vivo imaging of the Schlemm's Canal and the response to Selective laser trabeculoplasty

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OBJECTIVE: To evaluate the presence of angle dysgenesis on ASOCT (ADoA) as a predictive factor in determining outcomes of selective laser trabeculoplasty (SLT) .

DESIGN: A prospective clinical cohort study.

SUBJECTS: Patients with Juvenile onset open-angle glaucoma (JOAG) without angle dysgenesis on gonioscopy (ADoG) .

METHOD: JOAG patients with uncontrolled IOP, who were to undergo SLT, were evaluated for the presence or absence of ADoA, which was defined as the absence of Schlemm's canal (SC) and/or presence of hyper-reflective membrane (HM) over TM as identified on ASOCT before the SLT procedure. Further, the number of ASOCT B-scans in which SC was identified as present, were then quantified. Success of SLT was defined as a reduction of IOP by 20% or more from pre-laser value at 6-months follow-up without any further IOP-lowering medication or surgery. Only one repeat SLT was admissible for defining SLT success over the 6-month period. A successful reduction in IOP at six-month follow-up was correlated with the extent of ADoA.

RESULTS: In comparison to pre-SLT IOP, 57.1% (20/35) eyes showed more than 20% reduction in IOP at six months with a mean reduction of 7.6 ± 1.8 mmHg (29.6%) . When all three observers agreed, SC was identified in 80% (18/20) eyes with success vs 26.6% (4/15) eyes with failure (p < 0.05). 50% ASOCT B-scans (>25/50 scans/eye) showed success (p < 0.05). 50% of ASOCT scans was associated with a 21.4 times greater chance of success.

CONCLUSIONS: The presence of SC on ASOCT is a strong predictor for successful IOP reduction after SLT in JOAG eyes.

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REVIEW BY Francisco Goni

This is a prospective clinical cohort study including 46 Juvenile Open Angle Glaucoma (JOAG) patients between 10 - 40 years, showing in both eyes a repeated IOP >22 mmHg, open-angle and manifest glaucomatous optic neuropathy, who underwent a trial of 360 degrees Selective Laser Trabeculoplasty (SLT).

Enhanced Depth Imaging Anterior segment OCT (EDI ASOCT) was performed before the laser procedure. Absence of Schlemm's canal (SC) and/or presence of a hyper-reflecting membrane (HM) were considered as features of angle dysgenesis. Findings had to be agreed by at least 2 out of three evaluators. The appearance or nonappearance of these features was selected to compare the efficacy of SLT in both scenarios.

SLT success was defined as a reduction of IOP by 20% or more at 6-months, without any further IOP-lowering medication or surgery. Only one repeat SLT was allowed. 20 eyes (57.1%) succeeded, achieving a mean of 7.6 ± 1.8 mmHg (29.6%) reduction in IOP.

SC was identified in 24 (68.5%) eyes by at least 2 observers and in 22 (62.8%) eyes, by all 3 observers. HM was more difficult to identify, in 8 (22.9%) eyes by at least 2 observers and in 5 (14.3%) eyes by all 3 observers.

SLT was successful in 18/22 (82%) eyes in which SC was identified as present by all 3 observers. In those eyes where SC was identified in $\geq 50\%$ ASOCT B-scan, all (19/19) eyes showed a successful reduction in IOP after

Comment. For comparison, in young normal individuals SC is detected in 100% of ASOCT sections with a highly variable distribution of its individual measurements. (1) On the other hand, medical treatment regimens were not specifically analyzed in the present study. It has been reported that SC area is significantly decreased after prostaglandin analog therapy, in contrast with aqueous humor suppressants like dorzolamide/timolol fixed combination. (2)

This study helps to gain a better understanding of the usefulness of SLT in JOAG. The identification of angle features like the presence or absence of SC in ASOCT images could represent a potential biomarker for SLT indication in these patients. Further studies are needed to aid in determining the true generalizability of these results.

References

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