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Long-Term Efficacy of Repeat Treatment with SLT: Seven-Years Follow up

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Disclosure

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- Speaker has independently conducted and financed original clinical research studies presented
- Speaker served as a speaker for Ellex and was compensated for this presentation

Introduction

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- **Selective Laser Trabeculoplasty (SLT) uses a Q-Switched frequency-doubled (532 nm) Nd:YAG laser which selectively targets melanocytes in the pigmented trabecular meshwork[1,2]**

1. Latina MA, et al. Selective targeting of trabecular meshwork cells: in vitro studies of pulsed and cw laser interactions. *Exp Eye Res*. 1995;60:359-372.
2. Latina MA, et al. Q-switched 532-nm Nd:YAG laser trabeculoplasty (selective laser trabeculoplasty): a multicenter, pilot, clinical study. *Ophthalmology*. 1998;105:2082-2090.

Introduction

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- A biologic response is induced, which involves release of cytokines and triggers macrophage recruitment, leading to an ultimate reduction in intraocular pressure[1]

1. Latina MA, et al. Q-switched 532-nm Nd:YAG laser trabeculoplasty (selective laser trabeculoplasty): a multicenter, pilot, clinical study. *Ophthalmology*. 1998;105:2082-2090.

Background

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- Method of action is selective photothermolysis[1]
- No thermal nor coagulative damage to surrounding tissue[1,2]
- Pigmented cells are targeted[1,2] – no peripheral anterior synechiae

1. Latina MA, et al. Selective targeting of trabecular meshwork cells: in vitro studies of pulsed and cw laser interactions. *Exp Eye Res*. 1995;60:359-372.
2. Latina MA, et al. Q-switched 532-nm Nd:YAG laser trabeculoplasty (selective laser trabeculoplasty): a multicenter, pilot, clinical study. *Ophthalmology*. 1998;105:2082-2090.

Background: GLT

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- **The Glaucoma Laser Trial[1]**
  - **Established efficacy of laser trabeculoplasty, in lowering IOP in patients with previously untreated primary open-angle glaucoma**
  - ***Arch Ophthalmol*. 1989;107:1135-1142.**

1. The GLT Research Group. GLT. 1. *Arch Ophthalmol*. 1989;107:1135-1142.

Background: OHTS

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➢ The Ocular Hypertensive Treatment Study[1]

- Treated patients had half risk of developing early glaucoma
- Early treatment prevents/delays onset of glaucoma
- Established efficacy of early treatment to preserve long term vision in glaucoma patients
- *Arch Opthalmol*. 2002;120:701-713.

1. Kass MA, et al. OHTS. *Arch Ophthalmol*. 2002;120:701-713.

Background: EMGT

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➢ The Early Manifest Glaucoma Trial[1]

- Treatment reduced risk of developing significant glaucoma
- Lowering IOP in newly diagnosed glaucoma patients slows progression of visual field loss
- Established efficacy of effective treatment to preserve long term vision in glaucoma patients
- *Arch Opthalmol.* 2002;120:1268-1279.

1. Heijl A, et al. EMGT. *Arch Ophthalmol*. 2002;120:1268-1279.

Background: Current Thought

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- There does not seem to be any remaining question nor doubt that early treatment is beneficial
- Almost every long-term study shows a measurable and definable benefit to effective treatment
- *Paradigm shift* among glaucoma specialists:
  - Diagnose early
  - Treat effectively
  - Preserve vision

1. Int Gl Rev. 10-2 September 2008

Background: SLT

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- Cold Laser with 1/6000th flux density of hot laser
- Novel mode of action: does not cut, burn, nor scar
- Suitable for all types of glaucoma (POAG, PEX, PIG)
- Can be used as:
  - Initial therapy — Paradigm shift
  - Adjunctive therapy — Conventional
  - Repeat therapy — Novel action

Technique

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Energy:	**0.8 – 1.6 milliJoules**
Spot size:	**400 micrometers**
Total spots:	**90 – 110 spots**
Angle area:	**2–10 o'clock (240 deg)**
Endpoint:	***Champagne bubbles***

Technique

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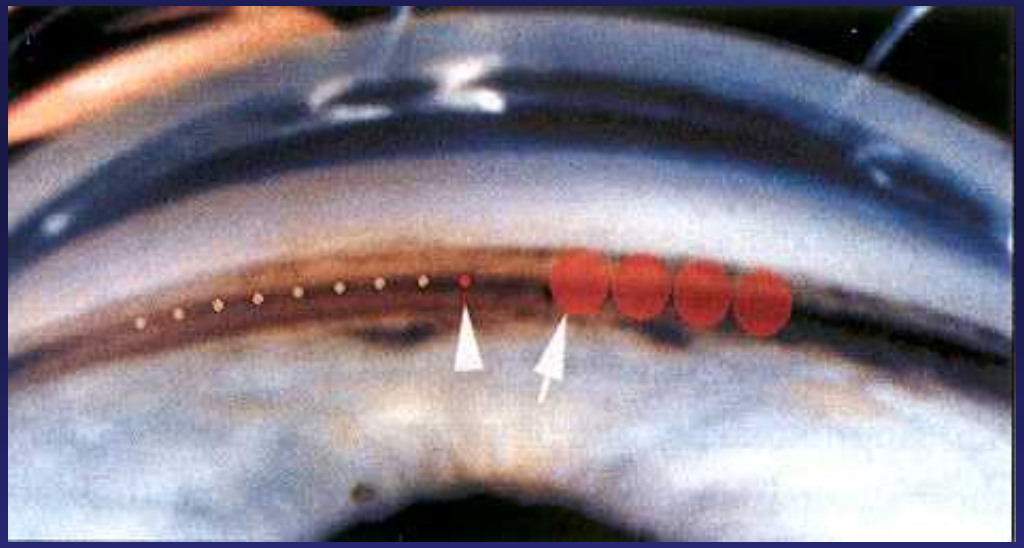

Key Points

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- Focus of spot not critical; must visualize trabeculum
- Treatment end point is *Champagne* bubbles
- Treatment energy usually 1.0 – 1.8 mJ
- Treatment spots 120 - 150 spots (total)
- Treatment area at least 240 -360 degrees
- Post-op NSAIDs twice daily for 3 days (No steroids)
- Remove meds slowly, taper prostaglandins first
- Be aware of late responders (3 months)

Purpose and Methods

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- **Purpose**
  - To examine the cumulative incidence of repeat therapy with Selective Laser Trabeculoplasty for patients with glaucoma.
- **Methods**
  - Retrospective chart review was performed on 2419 eyes from a consecutive case series of 3048 eyes over seven years.
  - Eyes were divided into those treated with primary and secondary therapy, into subgroups of 0-2, 2-4, and 4-6 years of follow up, and then were randomly selected for analysis.
  - The rates of repeat and times until repeat were analyzed.

Data Set: Repeat

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- 588 eyes out of 2419 eyes initially treated with SLT required repeat treatment
- Patients referred for IOP control / reduction in side effects
- Results were significant with $P < 0.01$

Results: Repeat

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- These data represent a repeat rate of
  - 11% of eyes treated over three years
  - 24% of eyes treated over five years
  - 24% of eyes treated over seven years
- Results were significant with $P < 0.01$

Results (Repeat Rates)

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- Eyes which had SLT as primary treatment, with follow up of 0-2, 2-4, and 4-6 years had repeat rates of 5%, 10%, and 9%, respectively.

- Eyes which had SLT as secondary treatment, with follow up of 0-2, 2-4, and 4-6 years had repeat rates of 40% , 60%, and 46%, respectively.

Years of Follow up	Primary Patients Repeat Rates (%)	Secondary Patients Repeat Rates (%)
0-2	5	40
2-4	10	60
4-6	9	46

- Results were significant with $p < 0.01$

Results (Time to Repeat)

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- Eyes which had SLT as primary treatment, with follow up of 0-2, 2-4, and 4-6 years, average days to repeat were 325, 1005, & 1837 days, respectively.

- Eyes which had SLT as secondary treatment, with follow up of 0-2, 2-4, and 4-6 years, average days to repeat were 298, 901, & 1619 days, respectively.

Years of Follow up	Primary Patients Time to Repeat (Days)	Secondary Patients Time to Repeat (Days)
0-2	325	298
2-4	1005	901
4-6	1837	1619

- Results were significant with $p < 0.01$

Discussion

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- The Glaucoma Laser Trial
  - Established efficacy of laser trabeculoplasty in lowering IOP in previously untreated glaucoma patients[1]
- The Ocular Hypertensive Treatment Study
- The Early Manifest Glaucoma Trial
  - Established efficacy of early and effective treatment to preserve long-term visual function in glaucoma patients[2,3]
- Our findings build on these studies and suggest SLT repeat rates were significantly less in patients treated with SLT as primary treatment.
- Further study with controlled clinical trials is indicated

1. The GLT Research Group. GLT. *Ophthalmology*. 1990;97:1403-1413.
2. Kass MA, et al. OHTS. *Arch Ophthalmol*. 2002;120:701-713.
3. Heijl A, et al. EMGT. *Arch Ophthalmol*. 2002;120:1268-1279.

Conclusion

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- In this series over the long-term:
  - Repeat rates after primary SLT at all time intervals examined, were significantly less than repeat rates after secondary SLT.
  - Time to repeat after primary SLT at all time intervals examined, was significantly more than time to repeat after secondary SLT.
- Results were significant with $p > 0.01$.

Summary

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- In this clinical series, REPEAT treatment with Selective Laser Trabeculoplasty :
  - Significantly lowered intraocular pressure
  - Significantly lowered number of meds
  - Clinically effective repeat rate

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