



# Effect of Selective Laser Trabeculoplasty on Diurnal Fluctuation of Intraocular Pressure

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# Introduction

- **Selective Laser Trabeculoplasty (SLT) uses a Q-Switched frequency-doubled (532 nm), low energy Nd:YAG laser, which targets melanocytes in the trabecular meshwork<sup>1,2</sup>.**
- **SLT treatment induces a biologic response in the trabecular meshwork, which involves the release of cytokines that trigger macrophage recruitment and other changes, leading to reduction in intraocular pressure (IOP).**
- **SLT treats the trabecular meshwork without causing thermal nor coagulative damage to surrounding structures.**

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.



# Purpose

- To examine the effect of Selective Laser Trabeculoplasty (SLT), as primary, secondary, or repeat therapy, on diurnal fluctuation of intraocular pressure (IOP) in patients with glaucoma .



# Methods

- Retrospective chart review was performed on 157 of 3,034 eyes from a consecutive case series of eyes treated with SLT over 8 years.
- Eyes were grouped according to therapy method (primary, secondary, or repeat).
- Those eyes selected for analysis each had a minimum of 10 follow-up morning or afternoon IOP values recorded per eye, over four years after SLT therapy.
- Two-tailed t-test was used to compare mean morning IOP and mean afternoon IOP.



# Results

- **There were:**
  - **51 primary eyes**
  - **50 secondary eyes**
  - **56 repeat eyes**
  
- **Mean follow-up was:**
  - **primary: 771 days**
  - **secondary: 552 days**
  - **repeat: 480 days**

**Note: those eyes selected for analysis had an average of 13.7 recorded follow-up morning IOP or afternoon IOP values per eye, over four years after SLT therapy.**



# Results

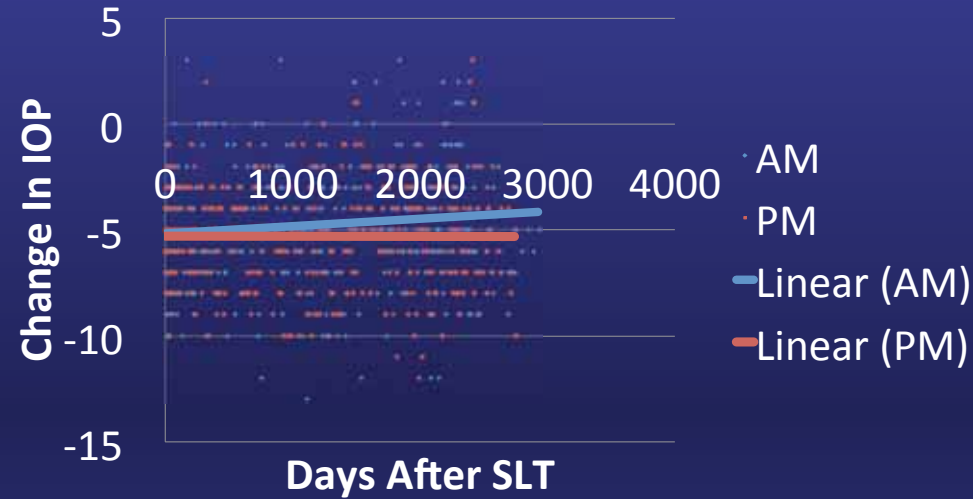
## Post SLT Mean Difference Between Morning IOP and Afternoon IOP

- Primary 0.3 mmHg ( $p>0.05$ )
- Secondary 1.7 mmHg ( $p<0.05$ )
- Repeat 0.4 mmHg ( $p>0.05$ )

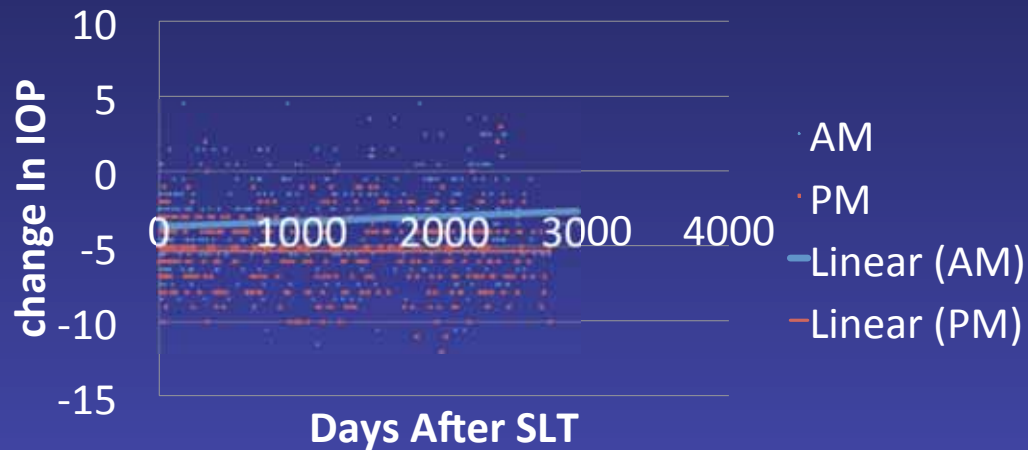


# Results

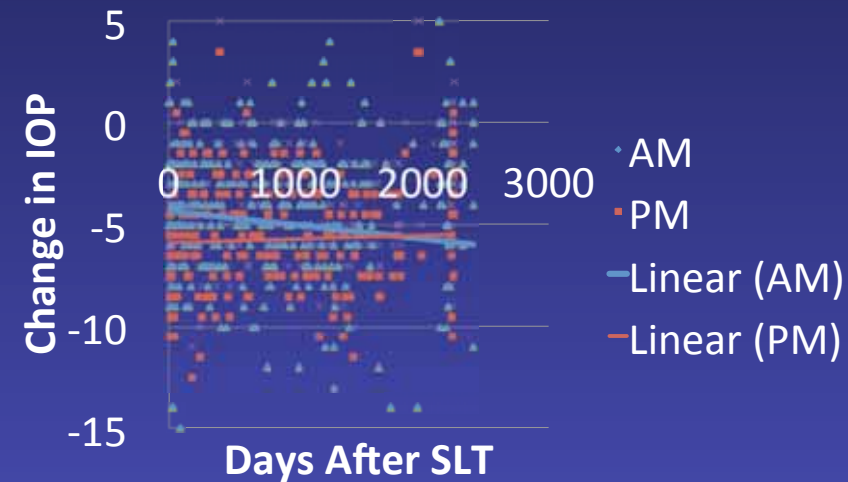
## Primary



## Secondary



## Repeats





# Discussion

- **The Glaucoma Laser Trial**
  - Established efficacy of laser trabeculoplasty in lowering IOP in previously untreated glaucoma patients<sup>1</sup>.
- **The Ocular Hypertensive Treatment Study and**
- **Early Manifest Glaucoma Trial**
  - Established efficacy of early and effective treatment to preserve long-term visual function in glaucoma patients<sup>2,3</sup>.
- **Our findings build on these studies and suggest treatment with SLT eliminated diurnal fluctuations of IOP in primary eyes and repeat eyes, while it did not eliminate diurnal fluctuations of IOP in secondary eyes.**
- **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

- In this large, long-term clinical series, when Selective Laser Trabeculoplasty was used as Primary treatment or as Repeat treatment, diurnal fluctuation of intraocular pressure appeared absent; when used as Secondary treatment, diurnal fluctuation of intraocular pressure appeared present.