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SLT in the armamentarium of glaucoma therapies

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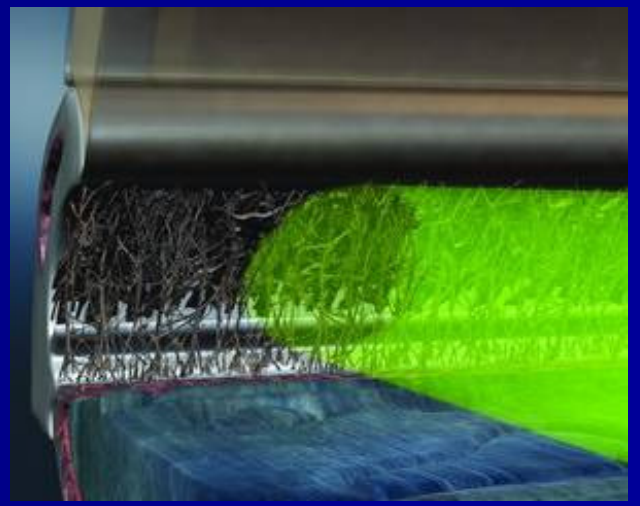
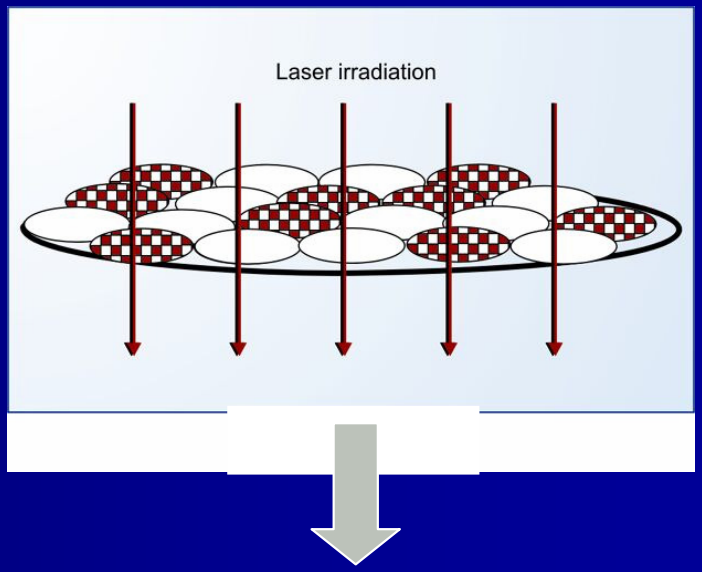
Questions

- Is SLT really a new therapeutic procedure?
- What is the difference to ALT?
- What is the IOP-lowering potencial?
- Depends the indication for SLT on the type of glaucoma?
- Depends the indication on the stage of glaucoma?
- Are there contraindications?



Selective Laser Trabeculoplasty: really a new procedure?

- developed by **Latina et al. 1995**
- q-switched, frequency-doubled Nd:YAG (534 nm)
  - puls duration of 3ns
  - spot size 400µm



~~**Mechanical theory (ALT)**~~

Cellular theory

- Induction of cell division
- Migration of macrophages

Latina MA, Park C. Exp Eye Res 1995; 60: 359-71

	SLT	ALT
Introduction	1995-1998*	1979**
Laser source	Nd:YAG (532 nm)	Argon (488-514nm)
Laser burns	50	50
Spot size (µm)	400	50
Duration	3 nsec	0,1 sec
Degree of treated angle	180	180
Clinical criteria	Bubble formation	Bubble formation and blanching

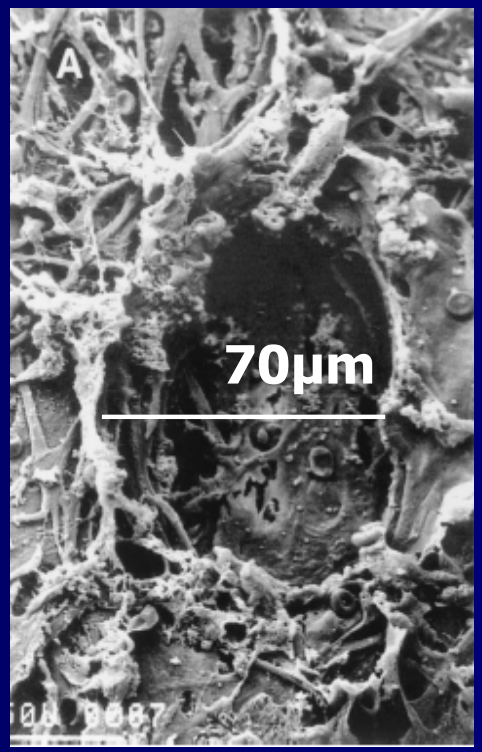
* Latina MA ET AL. Ophthalmology 1998;105:2082-2090

** Wise JB, Witter SL. Arch Ophthalmol 1979; 97:319-22

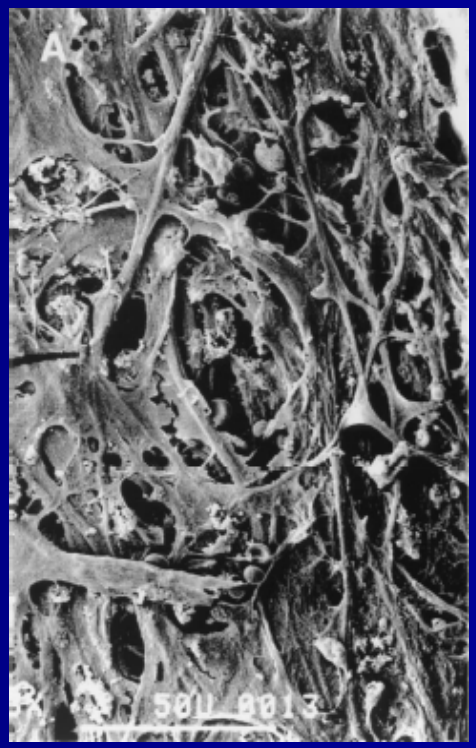
Morphologic changes after SLT and ALT in human autopsy eyes

A. Scanning electron microscopy*

ALT



SLT

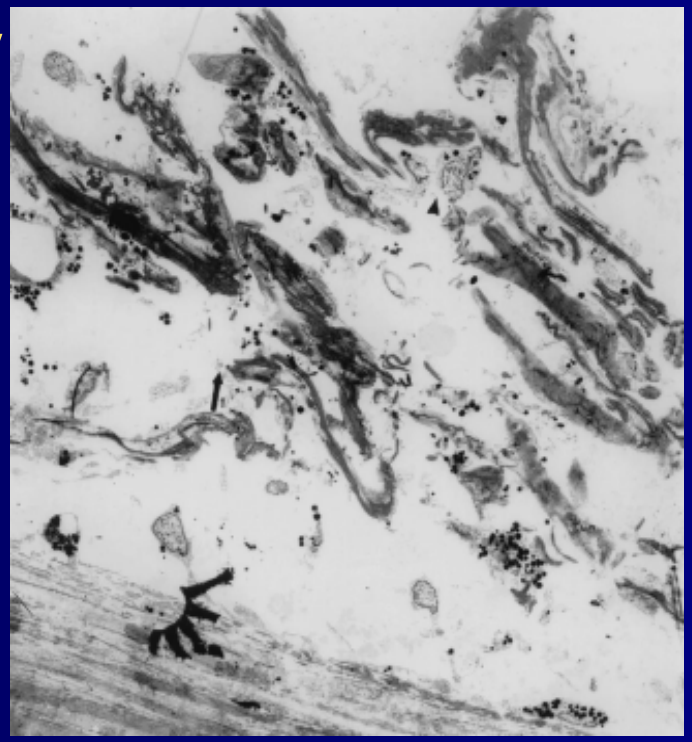


* Kramer TR, Noecker RJ. Ophthalmology 2001; 108: 773-779

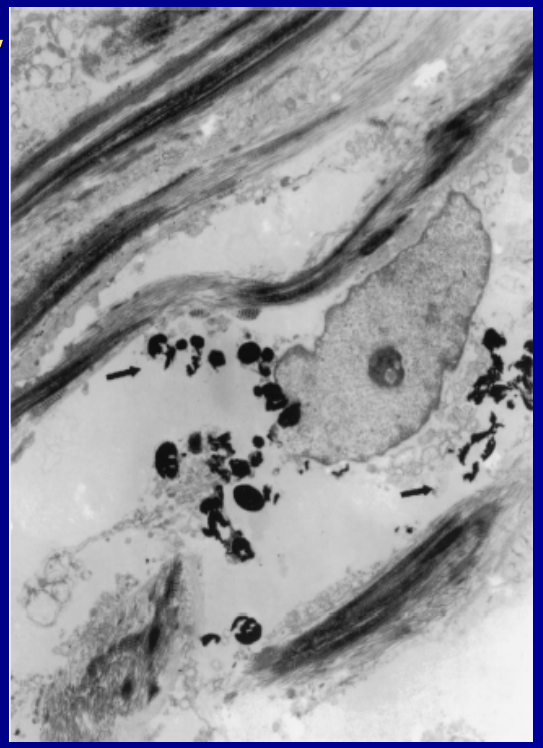
Morphologic changes after SLT and ALT in human autopsy eyes

B. Transmission electron microscopy*

ALT



SLT



* Kramer TR, Noecker RJ. Ophthalmology 2001; 108: 773-779

Clinical comparison of SLT versus ALT

	IOP-lowering effect	
Karim et al. *Br J Ophthalmol 1999*	ALT = SLT (6 months)	Better results with SLT than Re-ALT in patients with previous ALT
Juzych et al. Ophthalmology 2004	ALT = SLT (5 years)	**Sucess rate 1 / 3 / 5y:** SLT 68% / 46% / 32% ALT 54% / 30% / 31%

Karim FD, et al. Br J Ophthalmol 1999; 83: 718-722
Juzych MS, et al. Ophthamolology 2004; 111: 1853-1859

Summery efficacy / safety: SLT versus ALT

	SLT	***ALT***
Efficacy	comparable	
Total laser energy	much higher with ALT (appr. 80x)	
Discomfort / pain	Less discomfort with SLT*	
Inflammation	Less anterior chamber reaction after SLT*	
IOP-elevation	Comparable (appr. 20% 5mmHg or more)	
Re-Treatments	Higher sucess rate after previous ALT	Markedly reduced efficacy**
Long term effects	?	Higher rate of scarring after trabeculectomy

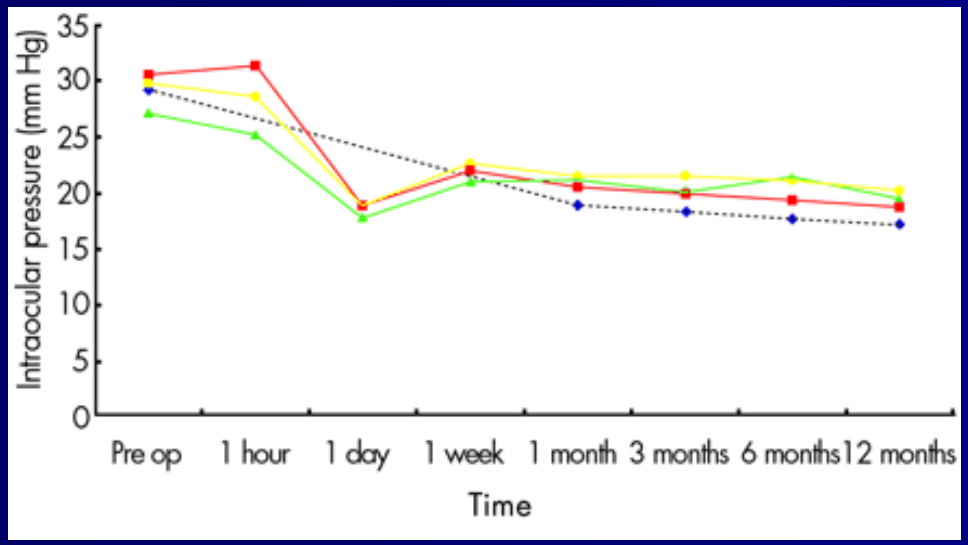
* Martinez-de-la-Casa et al. Eye 2004; 18: 498-502

** Feldmann et al. Ophthalmology 1991; 98: 1061-1065

Short- and Mid-term clinical results

Hodge et al. *Br J Ophthalmol 2005*	**60%** 1 year, POAG >20% IOP reduction	No age relation Higher success in patients with higher baseline IOP
Latina et al. *Ophthalmology 1998*	**70%** 6 mo, POAG >3mmHg IOP reduction	Similar efficacy in patients with previous ALT
Melamed et al. *Arch Ophthalmol 2003*	**89%** 18 mo, POAG >5mmHg IOP reduction	Increase of IOP >5mmHg 1 hour after treatment in 11%

SLT v monotherapy with latanoprost: A prospective randomized trial in POAG

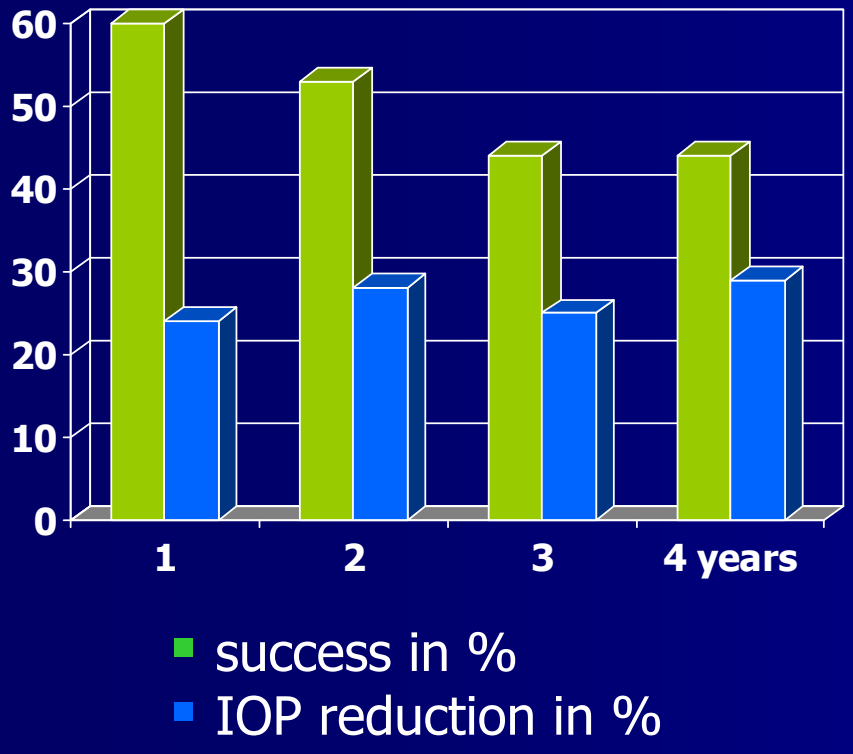


..... Latanoprost
- SLT 90°
- SLT 180°
- SLT 360°

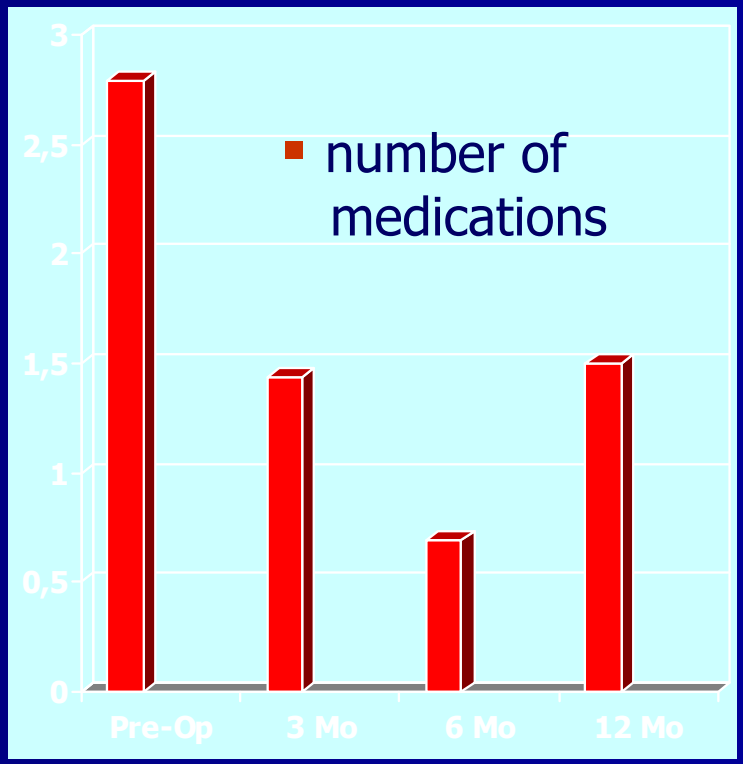
IOP ↓	Latano-prost	SLT 90°	SLT 180°
>20%	90%	34%	65%
>30%	78%	11%	48%

Nagar et al. Br J Ophthalmol 2005; 89: 1413-1417

Long-term clinical results and replacement of medical therapy

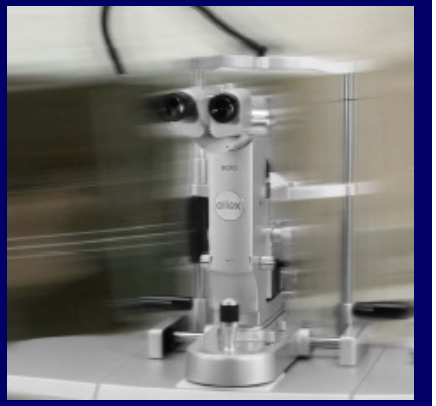


Weinand et al.
Eur J Ophthalmol 2006;16: 100-4



Francis et al.
Am J Ophthalmol 2005;140: 524-5

Answers



- SLT is effective and very safe in ***early POAG and OHT***
- IOP-lowering potential ***appr. 20-25% (>5 mmHg)***
- SLT is more effective in patients with ***higher IOP at baseline***
- Reduction of IOP to the upper tens ***target IOP 15-20mmHg***

- Reduction of medical therapy in controlled glaucoma
- Treatments are possible and effective after previous ALT

Indication and contraindication

- Indication

  Early POAG /OHT

  associated with

  - failure of primary medication
  - discomfort / allergy with primary medication
  - poor compliance

- Contraindication
  - advanced glaucoma (AGIS)
  - normal tension glaucoma
  - primary and secondary angle closure glaucoma
  - angle recession glaucoma
  - dysgenetic glaucoma
  - Active uveitis

Further Questions

- What are the biological effects inside the trabecular meshwork?
- Inputs for medical research?
- May SLT influence the results of filtering surgery at later time?
- How is the efficacy of SLT in glaucoma subgroups other than OHT and POAG?
- How is the efficacy of SLT as a retreatment after failed previous SLT?