A comparative study of selective and pascal laser trabeculoplasty in the treatment of open angle glaucoma and ocular hypertension

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INTRODUCTION

•ALT (argon laser trabeculoplasty)- conventional argon laser (454-529 nm) to photocoagulate the junction between the non-pigmented and pigmented trabecular meshwork (TM) to facilitate aqueous outflow, thereby decreasing the IOP (Intraocular pressure)

•PLT (Pattern ALT)- same argon laseris applied to the same location in a patterned way around the TM with the help of the PASCAL machine using specialised lens to avoid overlapping spot burn.

•SLT (selective laser trabeculoplasty) green (532 nm), Q-switched, frequency doubled Nd:YAG laser applied to pigmented TM with less heat dissipation.

OBJECTIVES

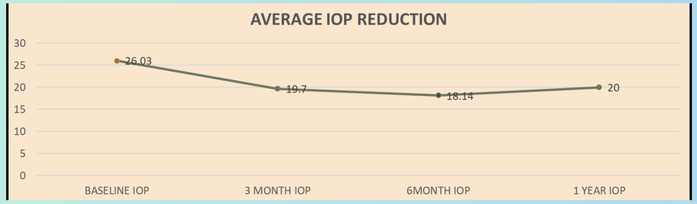
1. Evaluate the efficacy of selective laser trabeculoplasty(SLT) in reducing IOP in patients of open angle glaucoma.
2. Efficacy of SLT in ocular hypertension (OHT) , mild - moderate and advanced primary open angle glaucoma (POAG)
3. Assess the reduction in number of anti-glaucoma topicals used after SLT
4. Compare the results with Pascal laser trabeculoplasty (PLT)

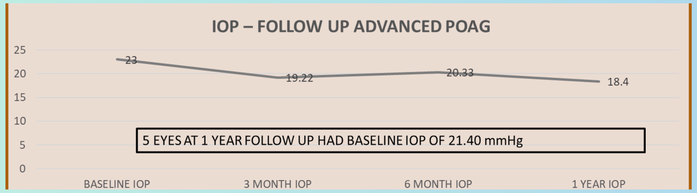
METHODOLOGY

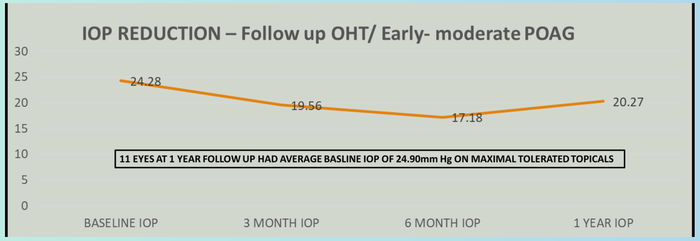
- Data of the SLT collected from the laser room logbook
- Retrospectively analysed – electronic records
- Pre-laser IOP, IOP with 3 months, 6 months and 1 year were taken.
- Treatment response was defined successful if there was a reduction of 3 mmHg or more (>20% from baseline) in IOP during the last visit when compared to pre- laser value.
- Conducted by 2 doctors in our department

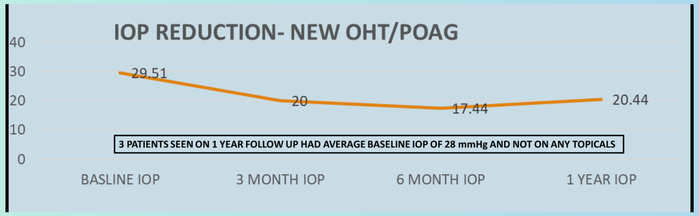
RESULTS

- 14 eyes underwent SLT of which 18 eyes- no follow up after SLT
  - 59 and 55 eyes by 2 doctors.
- 96 eyes were considered
  - 84 eyes were seen within first 3 months of follow up
  - 35 eyes with a 6 month follow up
  - 19 eyes with one year follow up
- 12 eyes were advanced glaucoma
- 49 eyes were OHT and mild to moderate POAG on long-term follow up and topical
- 35 eyes were new patients diagnosed with either ocular hypertension or POAG and started on topicals when they were listed for SLT
- 21 were OHT and 14 eyes were POAG









- No reduction in the topicals both in advanced glaucoma and follow up OHT and POAG patients.
- 17 out of 21 eyes with OHT (80.95%) and 7 out of 14 eyes with POAG (50%) treated with SLT are currently drop free.

COMPARE SLT RESULTS WITH PLT

IOP DECREASE ≥3mmHg	No of patients (post-SLT 3months)	No of patients (post-SLT 6mths)	No of patients (post-PLT 1 year)
SUCCESS	68 (80.95%)	28 (80%)	15 (78.95%)
UNSUCCESSFUL	16	7	4
TOTAL	84	35	19

IOP DECREASE ≥3mmHg	No of patients (post-PLT 1month)	No of patients (post-PLT 6mths)	No of patients (post-PLT 1 year)
SUCCESS	28 (53.84%)	20 (62.5%)	21 (50%)
UNSUCCESSFUL	24	12	21
TOTAL	52	32	42

CONCLUSIONS

1. Selective laser trabeculoplasty (SLT) has shown promising results in lowering intra ocular pressure in POAG and OHT
2. Results are definitely better than Pascal laser trabeculoplasty
3. Treatment naïve eyes had better IOP lowering efficacy with SLT with drop-free eyes when compared to patients on long-term topicals.

Recommendations(as per NICE

Offer SLT as first line medication in all patients with POAG and OHT confirmed on gonioscopy. However, prescribe anti-glaucoma topicals during the interim period while awaiting laser.

Offer SLT to follow up patients with POAG and OHT when target IOP is not achieved based on the visual field defect or progression. (at any time of topping or switching topical)

Patients with narrow angle with lens changes – advised initial cataract surgery and with follow up SLT if target IOP not achieved.

REFERENCES

- *Bovell AM, Damji KF, Hodge WG, et al. Long term effects on the lowering of intraocular pressure: selective laser or argon laser trabeculoplasty? Can J Ophthalmol. 2011;46:408-413.*
- *Juzych MS, Chopra V, Banitt MR, et al. Comparison of long-term outcomes of SLT versus ALT in open-angle glaucoma. Ophthalmology. 2004;111:1853-1859.*
- *Liu Y, Birt CM. Argon versus selective laser trabeculoplasty in younger patients: 2-year results. J Glaucoma. 2012;21:112-5.*
- *Garg A, Vickerstaff V, Nathwani N, Garway-Heath D, Konstantakopoulou E, Ambler G, Bunce C, Wormald R, Barton K, Gazzard G; Laser in Glaucoma and Ocular Hypertension Trial Study Group. Primary Selective Laser Trabeculoplasty for Open-Angle Glaucoma and Ocular Hypertension: Clinical Outcomes, Predictors of Success, and Safety from the Laser in Glaucoma and Ocular Hypertension Trial. Ophthalmology. 2019 Sep;126(9):1238-1248.*
- *Park JH, Chung HW, Yoon EG, Ji MJ, Yoo C, Kim YY. Morphological changes in the trabecular meshwork and Schlemm's canal after treatment with topical intraocular pressure-lowering agents. Sci Rep. 2021 Sep 13;11(1):18169.*
- *Keller KE, Peters DM. Pathogenesis of glaucoma: Extracellular matrix dysfunction in the trabecular meshwork-A review. Clin Exp Ophthalmol. 2022 Mar;50(2):163-182.*