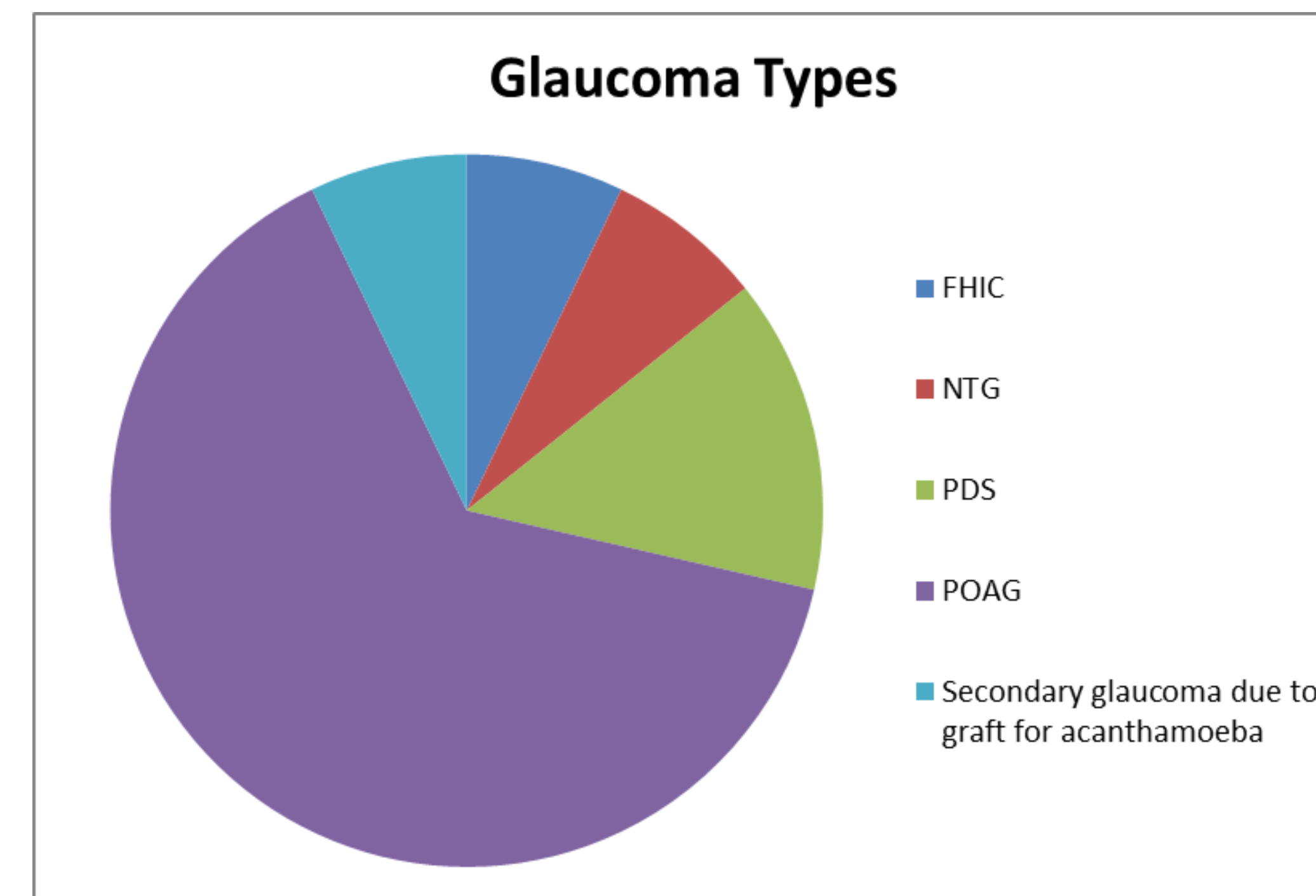


A Light Touch To Treating Glaucoma?

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Introduction and Aims

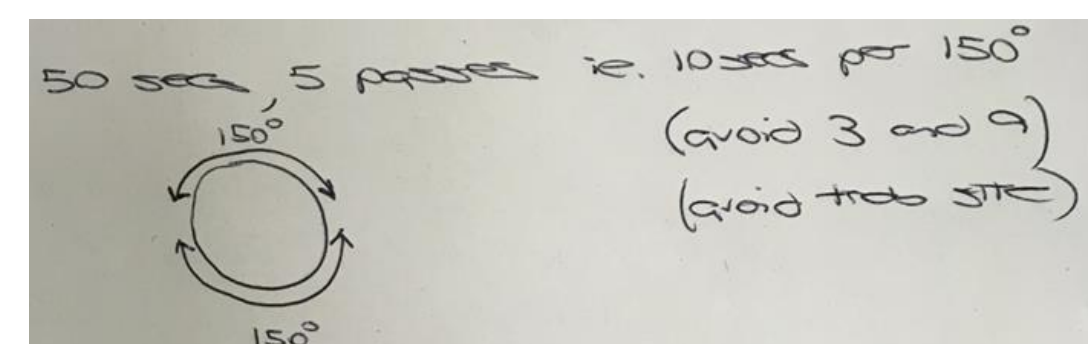
We performed an audit of the MicroPulse® cyclodiode LASER (chops a continuous wavelength into shorter pulses). These shorter pulses reduce the amount of heat spread to other tissues and allows treated tissue to cool between pulses thus is less damaging to ocular structures compared to traditional cyclodiode¹⁻³. This gentler form of cyclodiode is titratable and repeatable². Because COVID limited eye theatre sessions, we used MicroPulse® to reduce: theatre time, clinic follow up, and complication risk compared to trabeculectomy. No clear guidelines exist regarding optimal MicroPulse® settings or number of treatments required for glaucoma control¹. Our study seeks to provide early data on real world effectiveness of MicroPulse®.



Methods

14 eyes in 12 patients with intraocular pressure above target level and concerns regarding glaucoma progression were treated with Cyclo G6® Glaucoma Laser System with MicroPulse P3® Glaucoma Device by Iridex in Raigmore Eye Theatre by 2 ophthalmology consultants and their 2 trainees using sub-Tenon's anaesthetic. Ocucoat was used as a coupling agent between the MicroPulse® probe and eye. The probe was carefully aligned with the limbus and “painted” in 10 second sweeps inferiorly and posteriorly (avoiding 3 and 9 o'clock areas) for a total of 50 seconds each for two arcs of 150 degrees superiorly and inferiorly. In patients with advanced glaucoma, we applied 40s of MicroPulse® superiorly over 120 degrees thus leaving a central 30 degrees untreated for a future trabeculectomy. All patients with trabeculectomy blebs only had MicroPulse® inferiorly. All MicroPulse® LASER delivery was standardized: 2500 mW with 31.3% Duty Cycle (0.5 milliseconds on and 1.1 milliseconds off) for all eyes utilizing manufacturer guidelines³. All eyes were given 1 mL of subconjunctival dexamethasone, gCyclopentolate 1%, and oc chloramphenicol at the end of the LASER session. Dexamethasone 0.1% and Chloramphenicol drops were given QDS for 2 weeks. All intraocular pressures were measured via Goldmann applanation tonometry.

MicroPulse® Probe¹ and Treatment Diagram



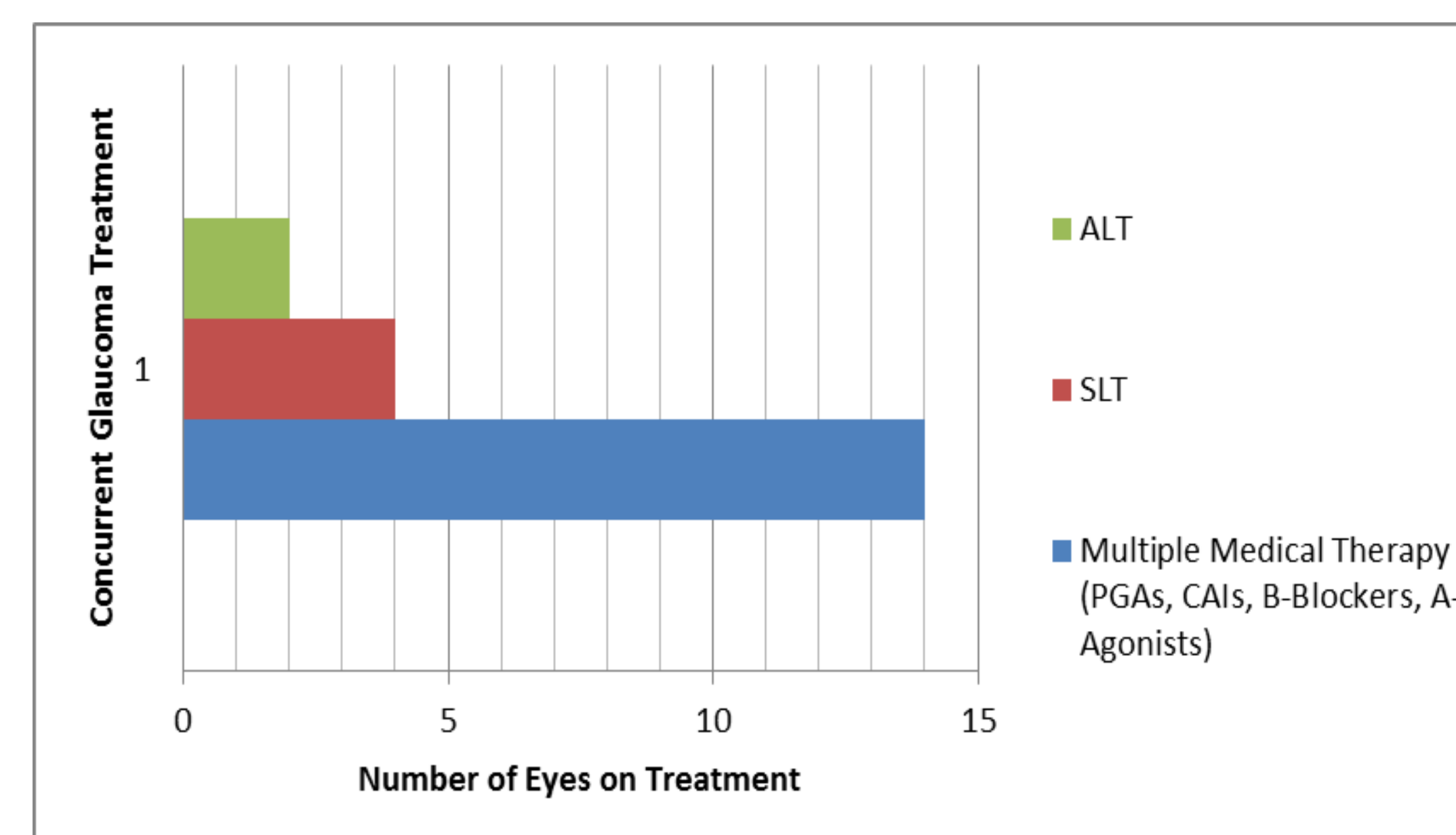
Results



Eye	Listing IOP	2 wk post-op	2nd Visit IOP
1	28	19	20
2	26	15	22
3	10	12	9
4	25	14	26
5	26	28	22
6	25	10	23
7	20	18	18
8	24	30	27
9	30	15	12
10	17	14	14
11	21	21	21
12	30	16	20
13	25	20	20
14	23	20	28
Average	23.6	18.0	20.1
Max	30	30	28
Min	10	10	9
Standard Deviation	5.3	5.7	5.5

Eye	Preop VA	Postop VA	Comment
1	6/9	6/9	
2	6/5	6/5	
3	CF (6/24+1 ph)	CF (6/24ph)	
4	6/12	6/60 (6/24ph)	cataract
5	6/60 (6/30)	6/36 (6/24pH)	cataract
6	6/5	6/5	
7	HM	HM	
8	CF	HM	cataract
9	6/9	6/9	
10	6/6	6/6	
11	6/5	6/6	
12	6/9	6/60 (6/18)	forgot glasses
13	6/5	6/9	
14	HM	HM	Advanced Glaucoma

Concurrent Glaucoma Treatment



Difference in IOPs between visits (mmHg)

Eye	Change in IOP between Listing IOP and 2 week post-op	IOP change between listing and 2nd follow-up.
1	-9	-8
2	-11	-4
3	2	-1
4	-11	1
5	2	-4
6	-15	-2
7	-2	-2
8	6	3
9	-15	-18
10	-3	-3
11	0	0
12	-14	-10
13	-5	-5
14	5	8
Avg	-5.0	-3.2

Conclusion

There was a lowering of IOP in 64.3% of eyes at 2 weeks and 71.4% at 2nd follow up. Due to team error regarding machine settings, 1 eye was not treated initially however the eye did not experience any change in IOP and has been retreated-data pending. 1 eye required further MicroPulse® a month later due to high IOP, however the IOP responded well following this 2nd treatment. 1 eye had an initial IOP spike requiring overnight admission post-op and was listed for traditional cyclodiode LASER however IOP settled without further LASER.

No eyes in this series experienced hypotony or inflammation, and visual acuity remained stable except for 3 patients with worsening cataract. Although follow-up is limited to less than 6 months, it is in keeping with previous studies which show a majority of eyes respond well to a single treatment, however a subset of eyes require multiple repeat treatments.

As this patient sample does not include treatment naïve eyes, it is difficult to fully elucidate the effectiveness of MicroPulse® with other confounding factors such as a transient increase in glaucoma medication compliance in the short term due to close clinical follow-up pre and post-operatively. Also, a likely “steroid response” in some eyes postoperatively may have contributed to post-operative IOP increases, and further study of these patients over a longer period of time is required. MicroPulse® may be a viable temporizing treatment modality to bridge the gap between maximal medical therapy and glaucoma filtration surgery, however longer term results need to be monitored.

References:

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- Nguyen AT, Maslin J, Noecker RJ. Early results of micropulse transscleral cyclophotocoagulation for the treatment of glaucoma. *European Journal of Ophthalmology*. 2020;30(4):700-705.
- <https://www.iridex.com/Products/GlaucomaDevices/CYCLOG6-MicroPulseP3.aspx>