Is YAG Better than STAB? Comparing objective, subjective vision, and OCT on Sub-Threshold Macular Grid Laser, Using Pascal Endpoint Management versus Anti-VEGF for Treatment of Central Retinal Vein Occlusion (CRVO)

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Introduction

Central Retinal Vein Occlusion (CRVO) can lead to significant vision impairment due to macular oedema and retinal ischemia. The traditional management approach has focused on anti-VEGF therapy. Recent studies have highlighted the potential role of sub-threshold macular grid laser using endpoint management (EpM) on Pascal. This audit compares treatment outcomes of of sub-threshold macular grid laser, anti-VEGF injections or both in CRVO treatment.

Methodology

A retrospective audit was conducted involving 50 patients diagnosed with persistent macular oedema secondary to CRVO, defined as central macular thickness (CMT) >300 µm on Topcon Optical Coherence Tomography (OCT) persisting beyond 6 months despite anti-VEGF therapy.

Treatment Groups

Group A (n = 20): Combined therapy (sub-threshold Pascal macular grid laser and anti-VEGF).

Group B (n = 20): Anti-VEGF monotherapy.

Group C (n = 10): Laser monotherapy.

Anatomical outcomes, functional outcomes, time to recurrence, treatment costs and safety profile in the three groups were compared.

Results

Baseline Characteristics

Variable	Group A Laser + Anti-VEGF	Group B Anti-VEGF only	Group C Laser only	P-Value
Mean age (yrs)	65.1 ± 7.9	66.4 ± 7.2	64.7 ± 6.8	0.71
Baseline CMT (µm)	476 ± 44	471 ± 38	479 ± 34	0.63
Baseline logMAR VA	0.79 ± 0.11	0.75 ± 0.13	0.81 ± 0.10	0.59

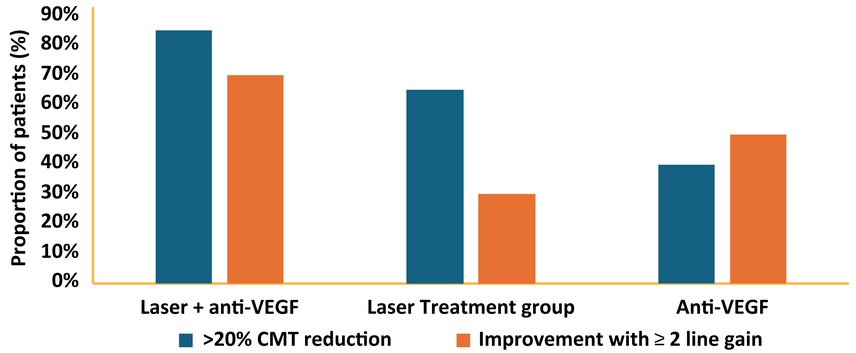
Anatomical Outcomes – Central Macular Thickness (CMT)

Group	Mean CMT Reduction at 12 Months (µm)	Mean CMT at 18 Months (µm)	P-Value
Laser + Anti-VEGF	125 ± 27	336 ± 30	<0.001
Anti-VEGF only	54 ± 22	416 ± 40	<0.001
Laser only	92 ± 26	368 ± 34	<0.001

Functional Outcomes – Visual Acuity (logMAR)

Group	Mean logMAR	P-Value
Laser + Anti-VEGF	0.23 ± 0.07	<0.01
Anti-VEGF only	0.09 ± 0.06	<0.01
Laser only	0.15 ± 0.08	<0.01

Anatomical and functional outcomes



Recurrence of Macular Oedema

Group	Mean Time to Recurrence (Weeks)	Comments
Laser + Anti-VEGF	16.8 ± 1.3	Most sustained control over oedema recurrence.
Anti-VEGF only	6.1 ± 1.4	Recurrence occurred much sooner.
Laser only	12.6 ± 1.2	Better than Anti-VEGF only, but not as sustained as the combination.

Treatment Burden & Cost-Effectiveness

Group	Mean No. of Injections (18 months)	Estimated Cost per Patient (£)	Saving Compared to Anti-VEGF Only (£)
Laser + Anti-VEGF	4.0 ± 1.3	£2,400	£2,275
Anti-VEGF only	8.5 ± 1.6	£4,675	-
Laser only	0	£400	£4,275

Group	% of patients reporting subjective visual improvement	Safety Profile
Laser + Anti-VEGF	80%	No significant complications; two patients had transient increases in intraocular pressure (managed with topical medications).
Anti-VEGF only	35%	Mild retinal haemorrhages in two patients, resolving without lasting issues.
Laser only	60%	No significant complications or retinal scarring.

Conclusions

- Combination therapy (Laser + Anti-VEGF) showed the best outcomes, with the most significant improvement in both visual acuity and CMT, and the longest time to recurrence.
- Laser-only therapy was cost-effective and provided substantial improvement, though slightly less effective than combination therapy.
- Anti-VEGF monotherapy had the lowest functional improvement and the highest recurrence rate.

This study supports the integration of laser therapy, both as a standalone and combined approach, in managing persistent CRVO-related macular oedema.

Reference

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