Efficacy of Micropulse 532 nm Green Laser in Diabetic Macular Edema

Sousa K., Ferreira C., Mendonça L., Gentil R., Mendes J., Leite R., Vaz F., Gomes N.

Hospital de Braga, Portugal

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The authors have no financial interest in any of the materials discussed.

Micropulse (MIP) Treatment

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- Pioneer treatment by Thomas R. Friberg and associates in the **late 1990s**.
- Several published articles for medical application in **DR, RVO and CSC.**
- Divides the laser emission into a "train" of **short, repetitive pulses** that persists for 0.1 to 0.5 seconds in a **"on-off time" interval** between successive micropulses: duty-cycle.
- Treatment **until 100 µm** from fovea?
- Possibility of **undertreatment** is a concern.
- **Not well estabilished**. No standards or dose-response clinical studies.

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MIP Clinical Studies Available

- Treatment in areas **not suitable for conventional** laser.
- **Continuous** wave-emission.
- Power is titrated **upward** for a barely visible tissue.

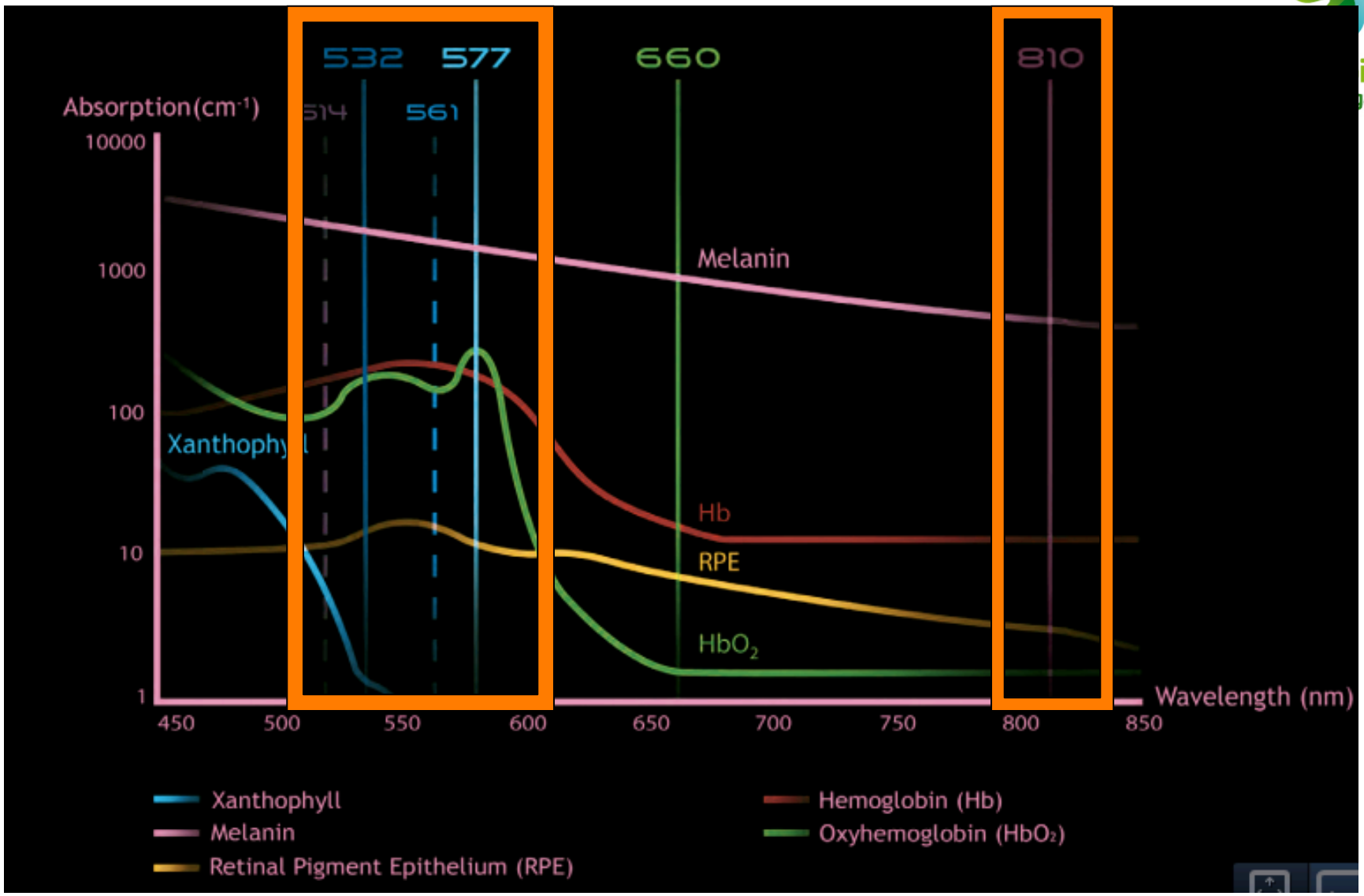
✓ 577 nm or 810 nm laser:

✓ Spot ~ 125 µm

✓ Variable duty-cycle: 0.5-10%

✓ Different power: 50-70%

Supra 532®



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Material and Methods

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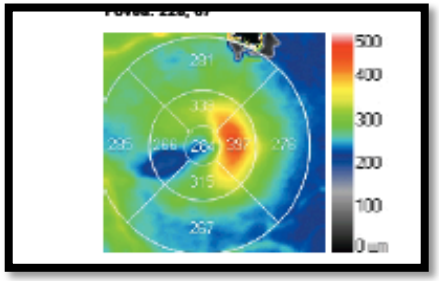
- Retrospective, non-comparative study.
- Micropulse laser treatment data since June 2012 until March 2013.

- Diabetic Macular Edema:
  - Not suitable for conventional laser treatment
  - Lack of response to intravitreal therapy (anti-VEGF or corticoid)



- 10% duty-cycle time, 200ms
- Spot diameter 50µm
- 70% of the power that causes mild whitening of the RPE on peripheral retina.

Demographic Results

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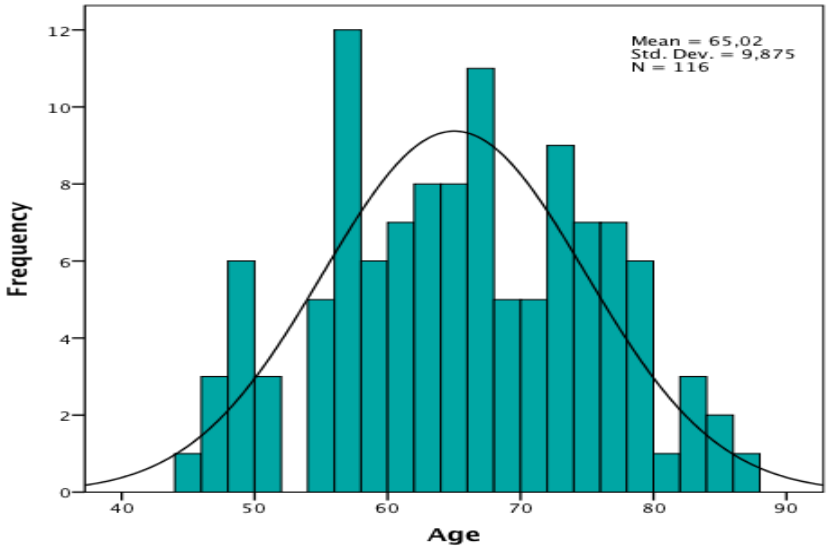
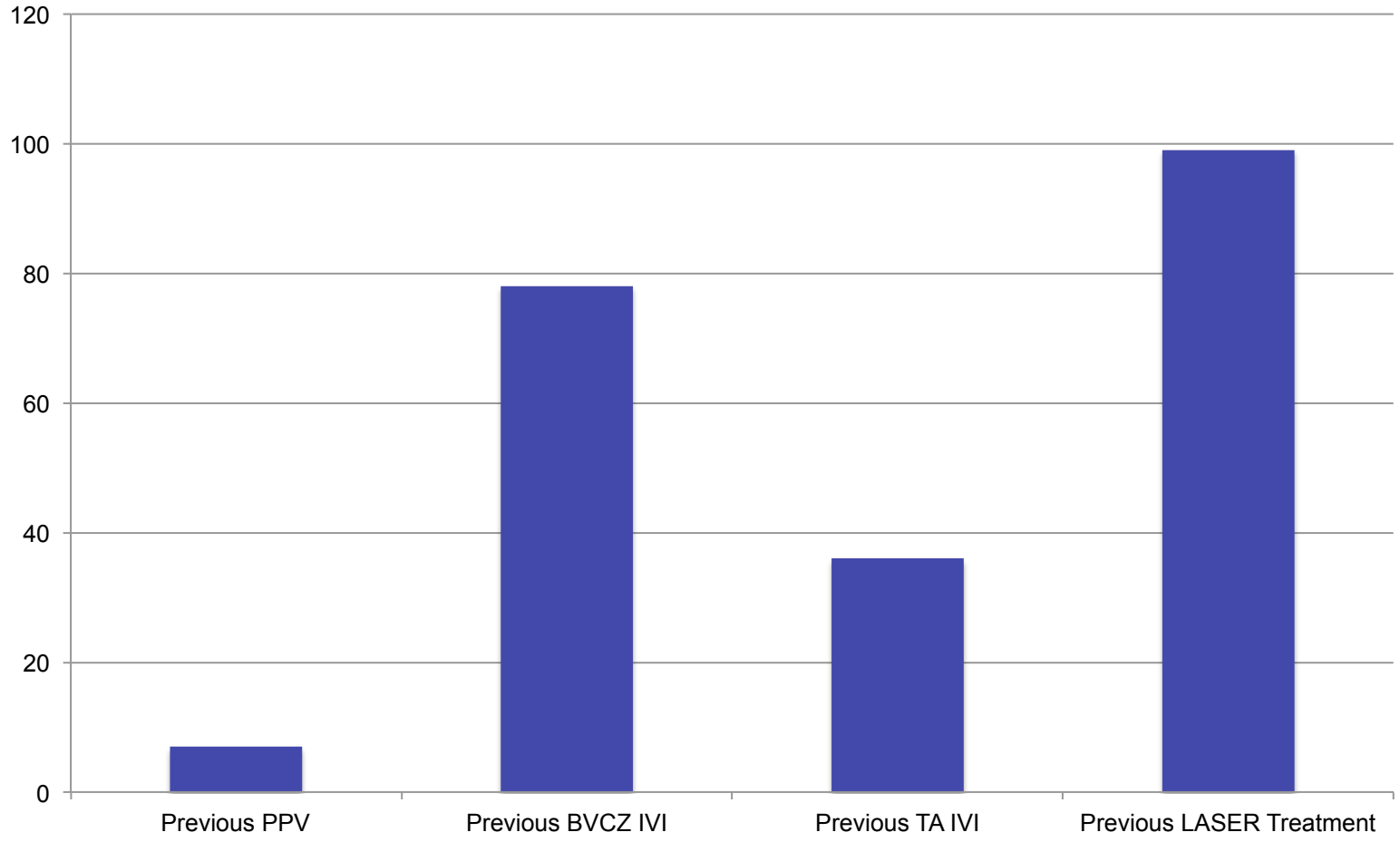
Total Sample	140 eyes. 24 eyes excluded.
Included	116 eyes 89 patients
Distribution	58 (50%) RE. 58 (50%) LE. 61 male (52,6%) 55 female (47,4%)
Age	65±9,88 years



Average spots number	49
Average Power	622±176 mW
Follow-up Time Range	4-18 months
DR type	PDR = 20 (17,2%) NPDR = 96 (82,7%)

Previous Treatments



7 (6%)	78 (67,2%)	36 (31%)	99 (85,3%)

Previous Treatment and Treated Area Thickness

Previous PPV (7)	Previous BVCZ (78)	Previous TA (36)	Previous Laser (99)	N	*p* value
No	No	No	No	5	0,325
No	No	No	Yes	21	0,160
No	No	Yes	Yes	3	0,465
No	Yes	No	No	7	0,034
No	Yes	No	Yes	34	0,572
No	Yes	Yes	No	2	0,195
No	Yes	Yes	Yes	24	0,3111
Yes	No	Yes	Yes	2	0,895
Yes	Yes	No	Yes	2	0,690

Visual Acuity – at first visit after mip

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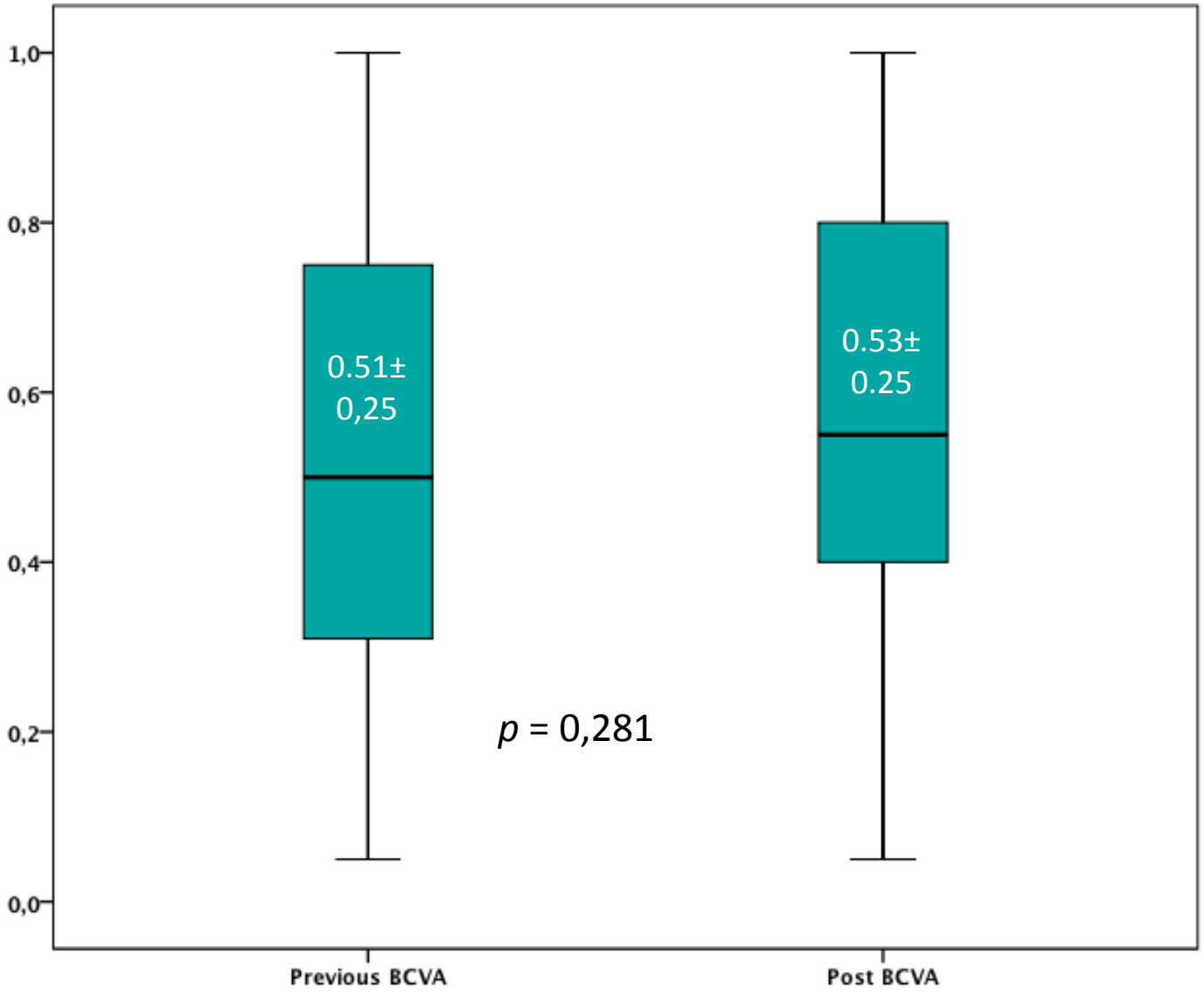
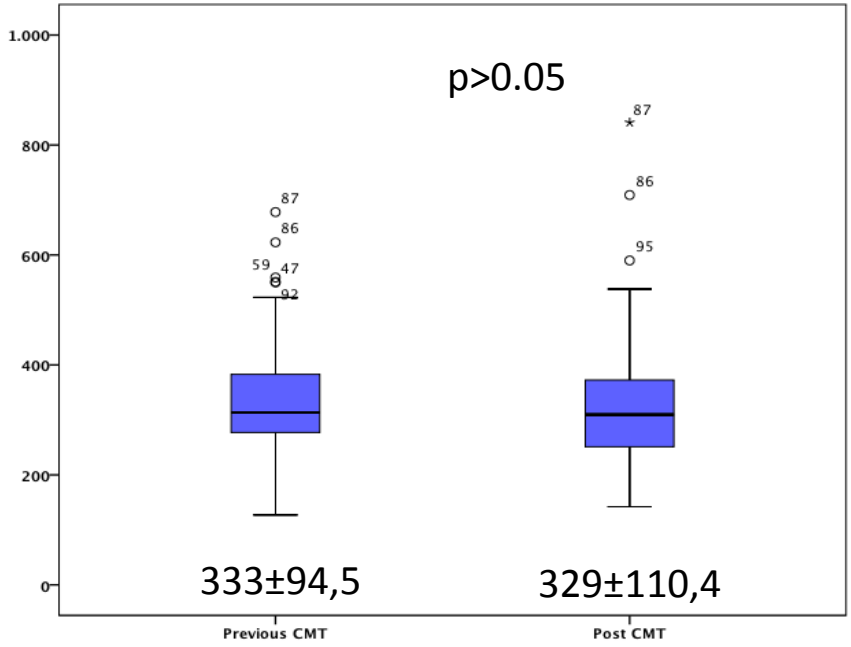
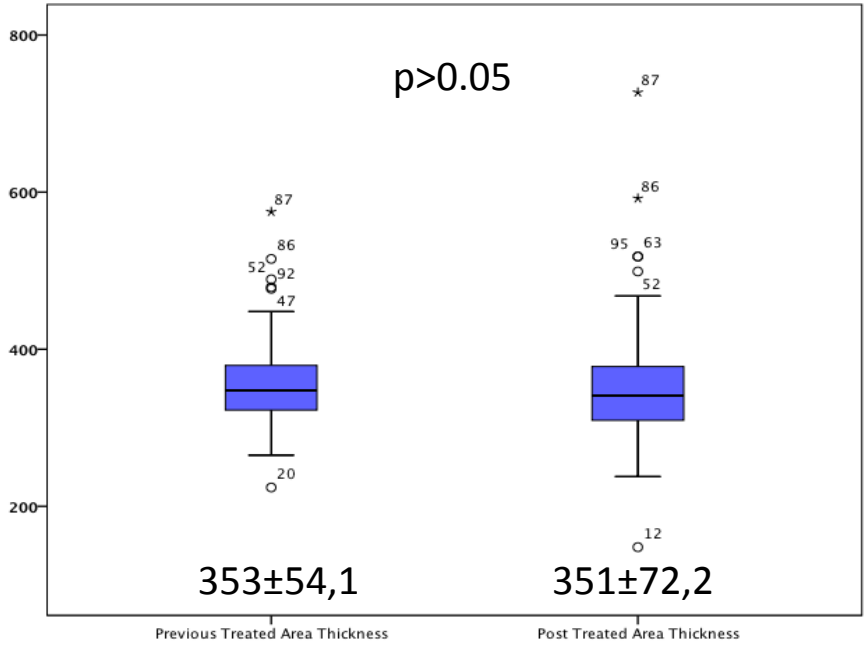
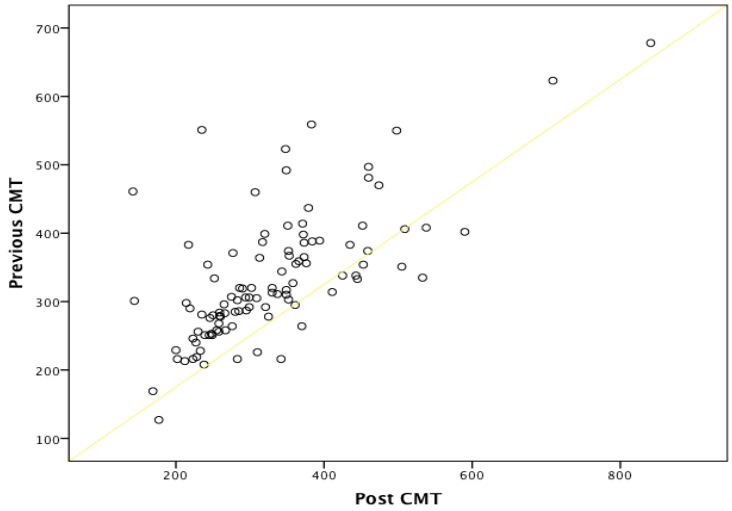
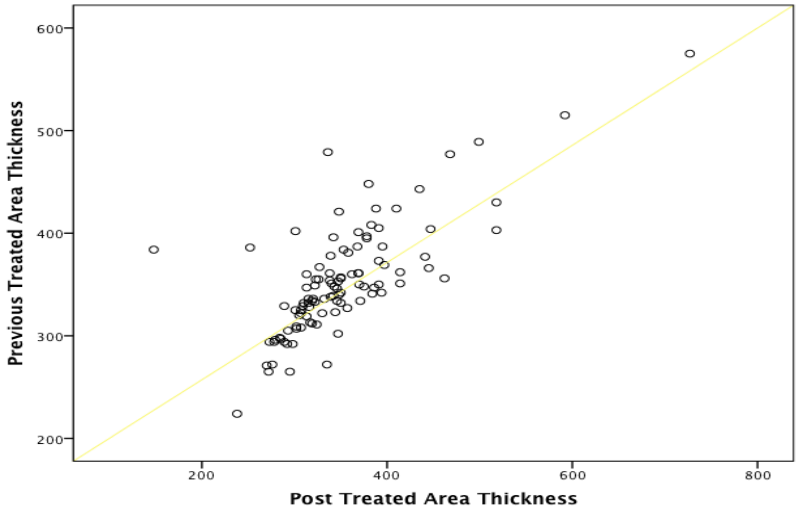


Macular Thickness Variation









Previous OCT → 3,21±0,84 months → Post-OCT

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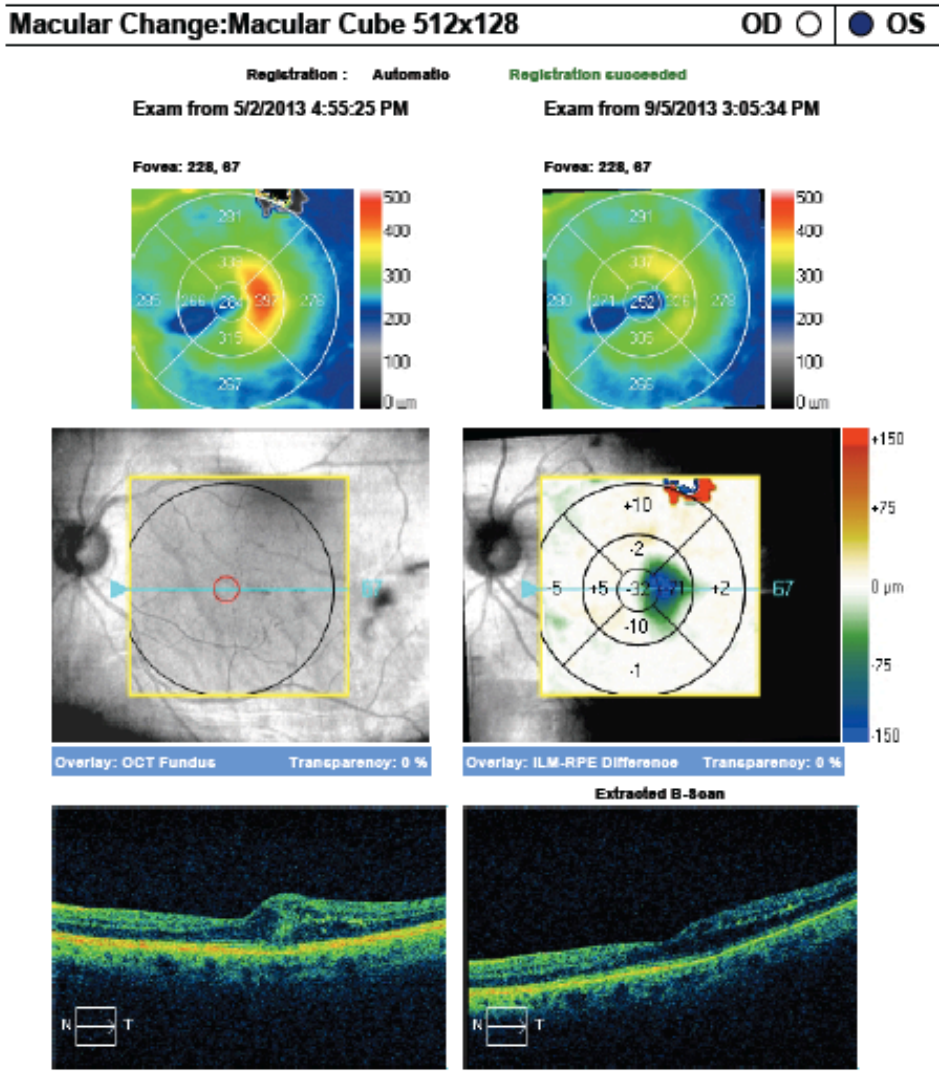
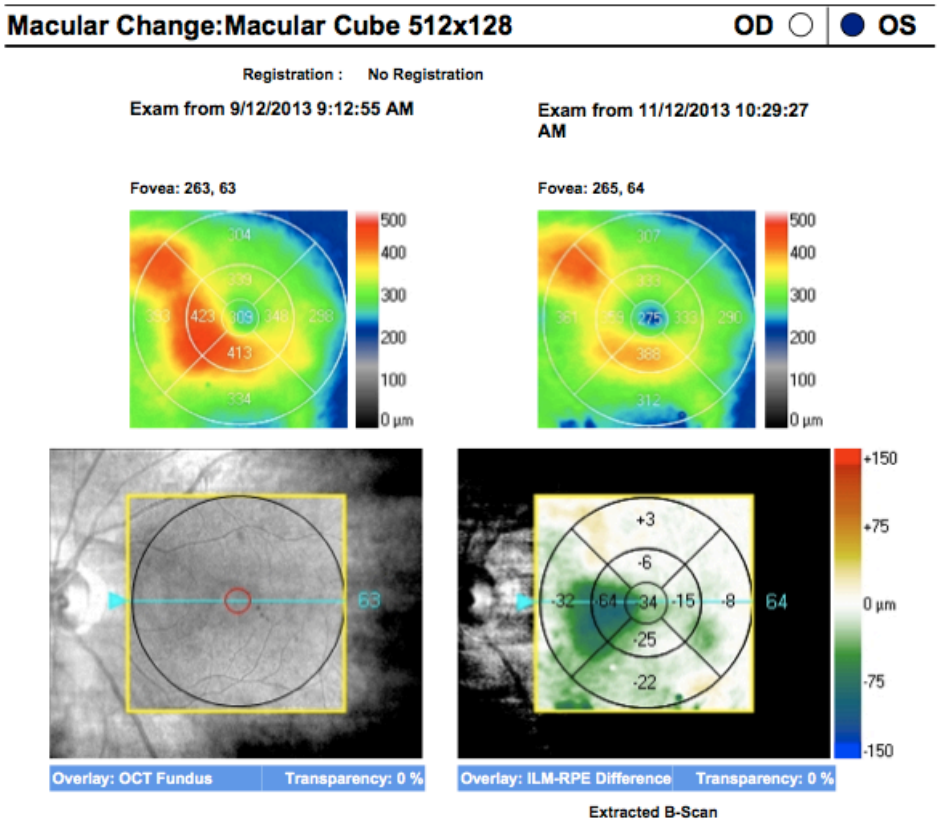
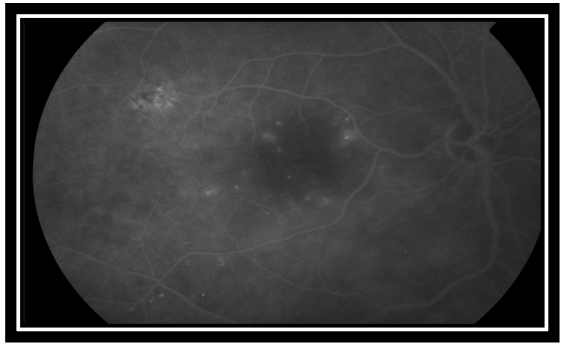
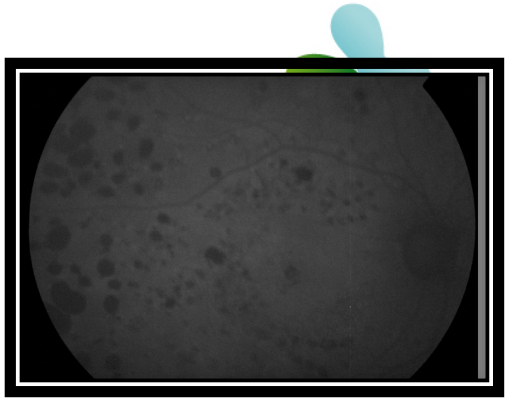


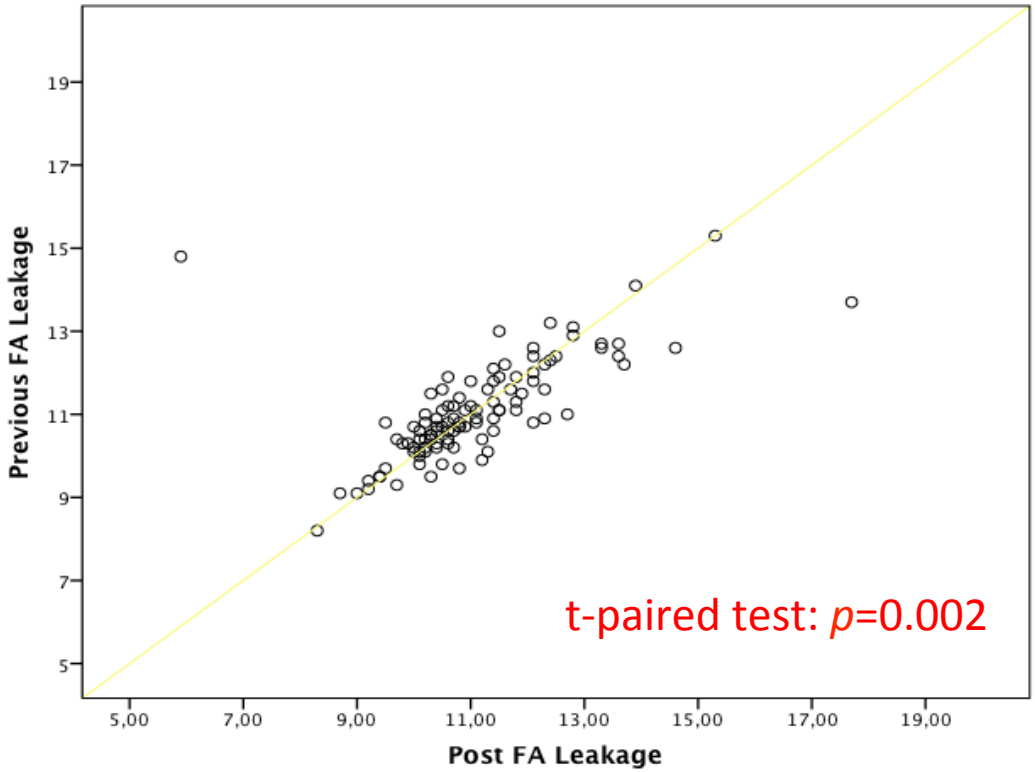


FA and FAF findings

- No visible LASER spots
- No RPE changes
- Decrease on leakage area







Previous FA
N=105

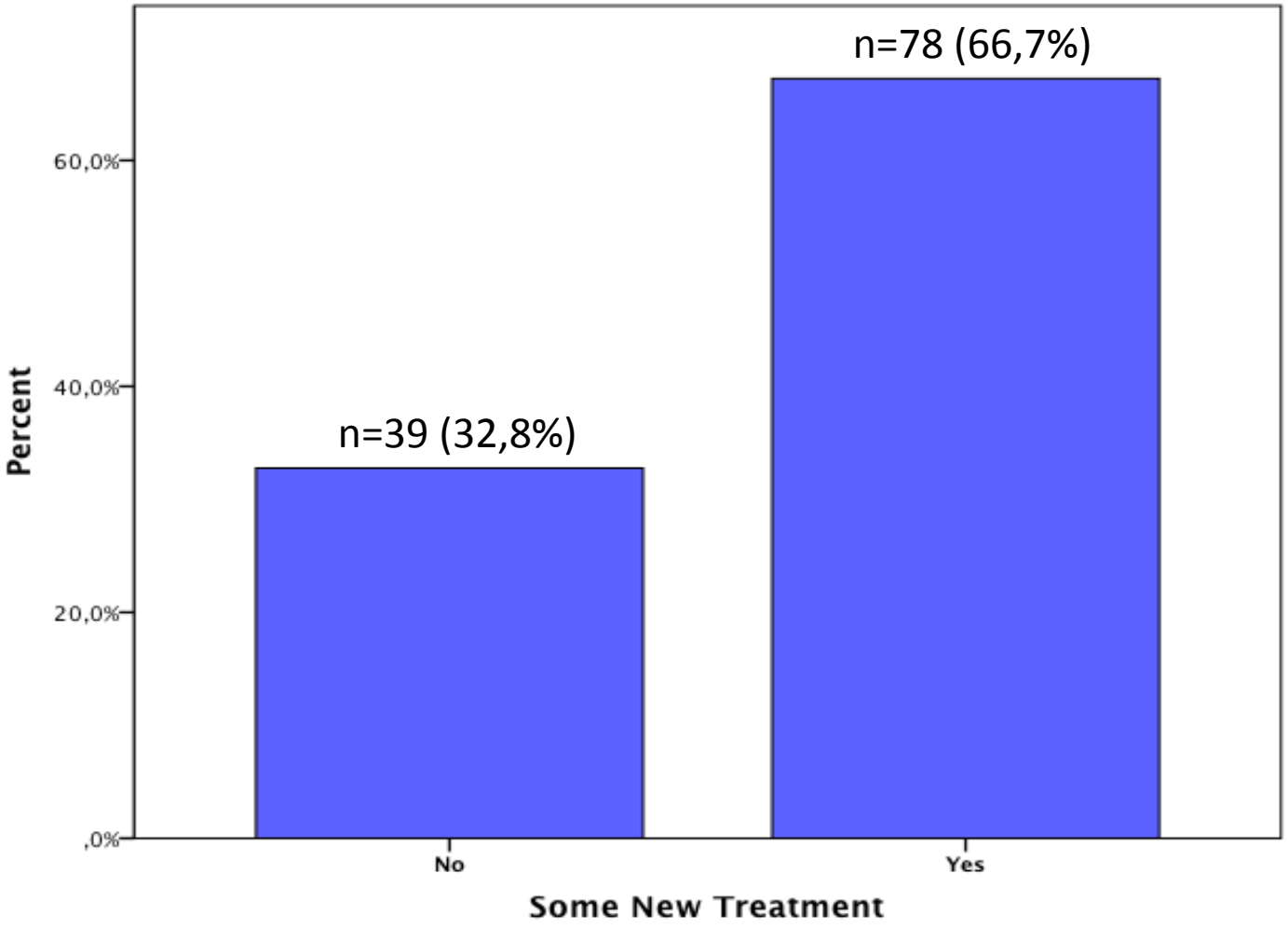
1,75±1,6 mm²

5,68
±1,32
months

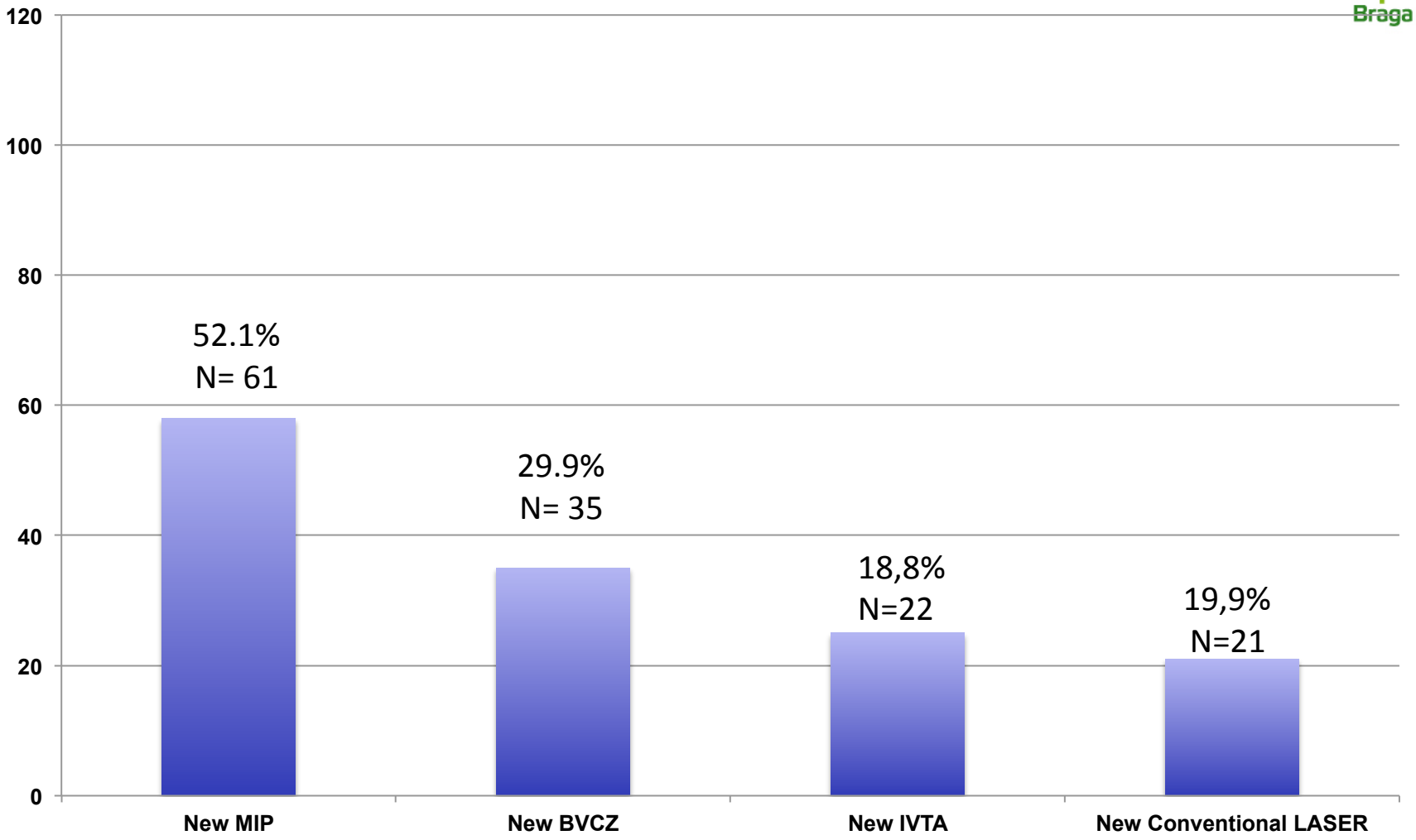
Post-FA
N=105

1,24±1,08 mm²

Retreatment



Retreatment



Limitations

- Retrospective and non-comparative study
- Non-naïve patients
- Difficult metabolic control
- Multiple variables involved
- More follow-up controlled time
- No published clinical trials with 532 nm
- Correct parameters?

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