

LASER IN DIABETIC MACULAR EDEMA: WHERE ARE WE?

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WHERE DO WE COME FROM?

- Gerhard Meyer-Schwickerath (≈1950) 
- Hans Littman: (Zeiss) xenon photocoagulator 
- Beetham and Aiello: 1969 Proliferative Retinopathy 

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TERMINOLOGY EVOLVING

- Argón láser: 488 and 514,5 nm. ETDRS study
 - Pulse duration: 100-200 miliseconds
- PASCAL (pattern scanning laser): 10 – 30 miliseconds
- SDM (subthreshold diode micropulse):
 - Low intensity-high density. Absorbed by the RPE.
- Navigated laser photocoagulation technique. Eye-track
 - Accurate: 100 microns within target.

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IDEAL LASER TREATMENT

- Injection-free (vs 9)
- Visual acuity GAINS (vs 10 letters)
- More cost-effectiveness (vs 1000\$ per inj)
- Less frequent visits
- Possibility of retreatment if needed
- No adverse events

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SUBTHRESHOLD

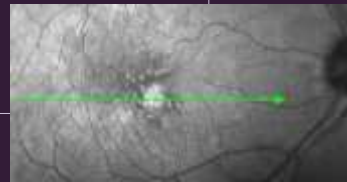
- Treatment is moving towards SUBTHRESHOLD
- First: "I do not see it so obviously"
- Then "I do not see it but Autofluorescence does"
- Finally "Nothing can see it"



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PARAMETERS: LEARNING CURVE FOR 810NM

- Retinal Spots: microns. Smaller is better.
- Duty cycle in %: around 5% safe
- Pulse duration: milliseconds
- Power: watts
- Density: higher is better

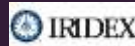


- ↓
- Precautions for 810 nm laser may not be enough for higher energy lasers

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AVAILABLE SYSTEMS...

-Retina specialists: know less of these



Than these



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LASER vs ANTIVEGF

-Conventional Macular Laser: in ETDRS study.

Reduce by half the LOSS of more than 15 letters
Suprathreshold (visible as white or grey)

-AntiVEGF in Diabetic Macular Edema (protocol T)

Inclusion: visual acuity between 20/32 and
20/320

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PUBLICATIONS WITH NEW LASERS

- 2014. 260 eyes with DME. *Luttrull et al.*
810 nm. 1000mW+300 ms+ 15% cycle+100μ
Stable VA 85%; worse 15%
improved VA 15% (from 0.61 to 0.66)
- 2015. *Vujosevic et al.* 50 patients
yellow vs infrared. Journal RETINA. Similar
- 2017. *Latalaska et al*
yellow laser. 75 patients.
Baseline VA 0.2 → final VA 0.3

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VISUAL ACUITY IN DME NATURAL HISTORY

Parameter	DEX Implant 0.7 mg (n = 86)	DEX Implant 0.35 mg (n = 88)	Sham (n = 101)
Patients with ≥15 letters BCVA improvement from baseline at study end, %*	23.3	15.9	10.9
Time to ≥15-letter improvement in BCVA from baseline			
Cumulative response rate at study end for ≥15-letter improvement in BCVA from baseline, %	57.4	43.7	26.3
Patients with ≥20/40 BCVA at study end, %*	29.1	30.7	17.8
Mean (SD) average change in BCVA from baseline across the study, letters	6.5 (8.1)	5.9 (7.1)	1.7 (7.1)
Mean (SD) change in BCVA from baseline at study end, letters*	6.1 (11.5)	6.2 (10.6)	1.1 (12.3)
Mean (SD) average change in central retinal thickness [†] from baseline across the study, μm	-131.8 (140.2)	-117.1 (127.1)	-50.8 (93.6)

-10% of patients improve 15 letters at the end of 3-year follow-up

-Retinal thickness decreases 50 microns

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META-ANALYSES

Biomed Pharmacother. 2018 Jan;97:293-299. doi: 10.1016/j.biopha.2017.10.078. Epub 2017 Nov 6.

Subthreshold diode micropulse laser versus conventional laser photocoagulation monotherapy or combined with anti-VEGF therapy for diabetic macular edema: A Bayesian network meta-analysis.

Wu Y¹, Ai P², Ai Z³, Xu G⁴.

VISION IMPROVEMENT:

Lucentis + Conventional laser (1st)

Micropulse subthreshold (2nd)

Avastin + Conventional laser (3rd)

Conventional laser alone (4th)



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SUBTHRESHOLD LASER GETS A SECOND PRIZE

-DID WE EXPECT A WINNER?

-What would be your first choice if you were the patient?

Non compliant patients...



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LASER IN COMBINATION THERAPY

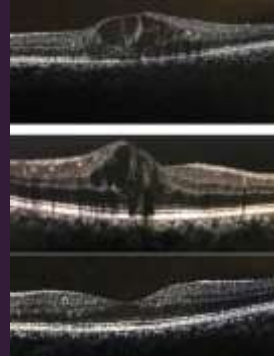
Combined Intravitreal Dexamethasone Implant And Micropulse Yellow Laser For Treatment Of Anti-VEGF Resistant Diabetic Macular Edema

Ahmed Hosni Abd Elhamid*

Ophthalmology Department, Ain Shams University Hospital, Cairo, Egypt

-AntiVGEF non-responders

-Ozurdex prior to LASER

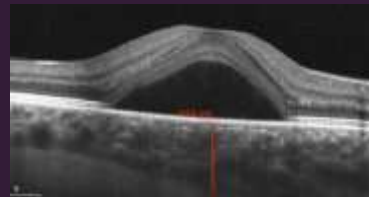


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LASER IN OTHER DISEASES

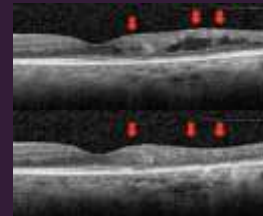
-Central Serous Chorioretinopathy: 2015 and 2016

micropulse 577nm
160 microns spot,
250 mW power,
exposure time 200 ms
duty cycle 5%



-Radiation macular edema: 2017

micropulse 577 nm
100 microns spot
duty cycle 15%



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**LASER SHOULD PLAY A
GROWING ROLE
IN OUR
THERAPEUTIC ARSENAL**

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