



# WORLD GLAUCOMA CONGRESS

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## Halt of Progressive Vision Loss by Optic Nerve Stimulation in Glaucoma

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M. KÖHLER<sup>1</sup>, C. ERB<sup>2</sup>, N. SALZMANN<sup>1</sup>, T. KÖHLER<sup>1</sup>, S. ECKERT<sup>3</sup>, S. SCHMICKLER<sup>4</sup>, M. ILIEV<sup>5</sup>

1 - Augenzentrum Salzmann, Hannover, 2 - Augenklinik Wittenbergplatz, Berlin, 3 - Medizentrum Eckert, Neu-Ulm, 4 - Augen-Zentrum-Nordwest, Ahaus, Germany, 5 - Glaukom Augenklinik Zurich, Zurich, Switzerland

email: eyetronic.glaucoma@gmail.com



### INTRODUCTION

Glaucoma is characterized by optic nerve degeneration and loss of retinal ganglion cells causing visual field defects and blindness (1). The current standard approach in glaucoma therapy is reduction of the intraocular pressure (IOP) (2). Despite effective medications leading to IOP-lowering, glaucoma exacerbation and progressive vision loss among patients is common (3,4). Electrical stimulation of the optic nerve (ONS) facilitates axonal regeneration and survival of retinal ganglion cells (5,6,7). The follow-up study provides real-world evidence for long-term clinical efficacy of ONS in glaucoma.

### METHODS

78 glaucoma patients, between 27 and 86 years old, with progressive vision loss despite therapeutic IOP reduction underwent electrical ONS. Closed eyes were separately stimulated by bipolar rectangular pulses with intensities up to 1.2 mA sufficient to provoke phosphenes (Eyetrionic®). Ten daily stimulation sessions within two weeks lasted about 60-80 min each. Right before ONS at baseline (PRE), visual field loss was documented by static threshold perimetry in the central 30° visual field and compared to the same assessment approx. one year afterwards (POST). Mean defect (MD) was defined as primary outcome parameter. Only perimetries with a reliability factor (RF) of max. 20% were considered.

### RESULTS

The perimetry follow-up of 111 eyes in 78 patients fulfilled the inclusion criteria.

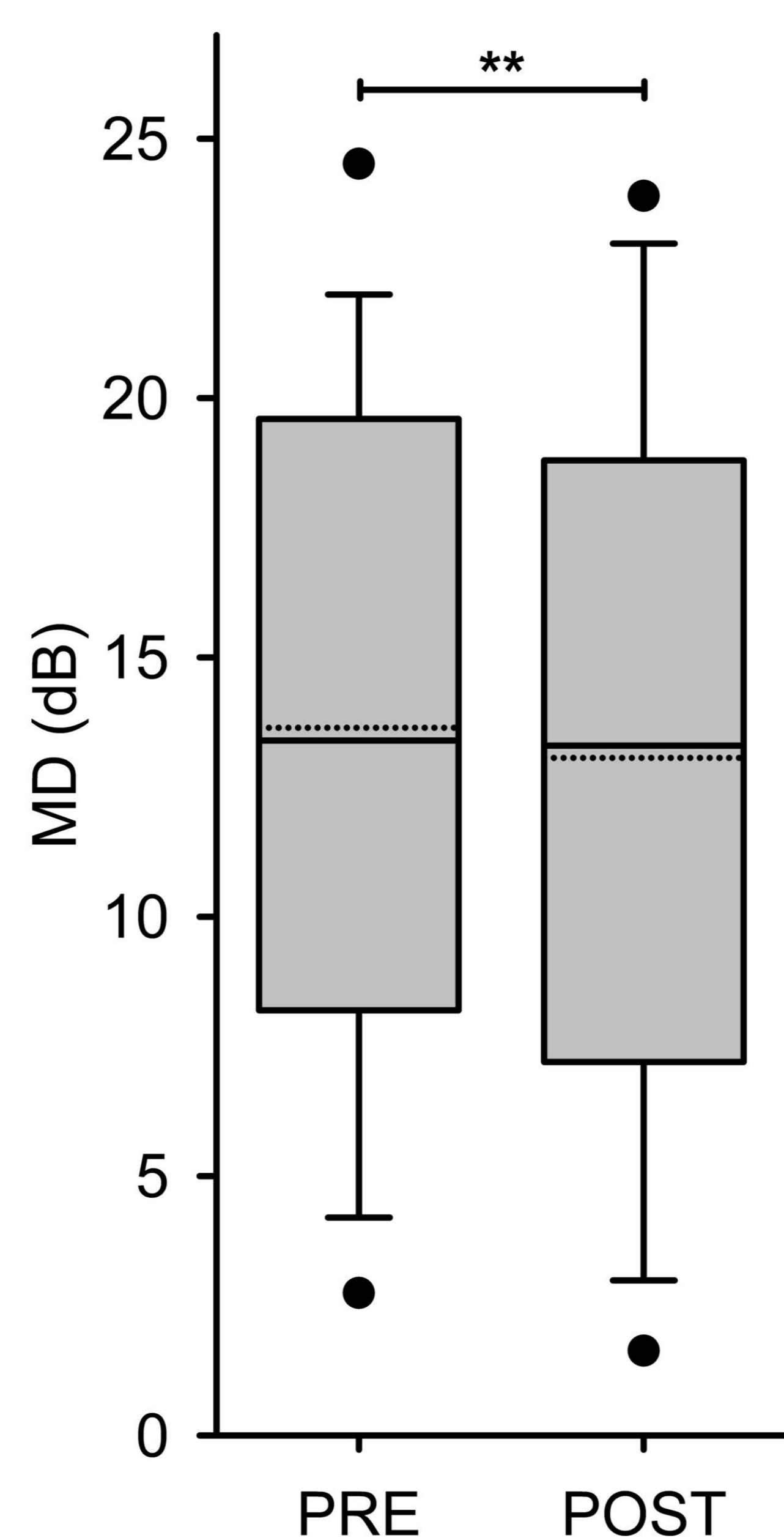
IOP before ONS was  $12.5 \pm 2.8$  mmHg (mean  $\pm$  SD).

MD significantly decreased from PRE  $13.6 \pm 6.8$  dB to POST  $13.1 \pm 7.1$  dB one year after ONS (Wilcoxon Signed Rank Test  $p < 0.01$ ) corresponding to an average improvement of visual fields.

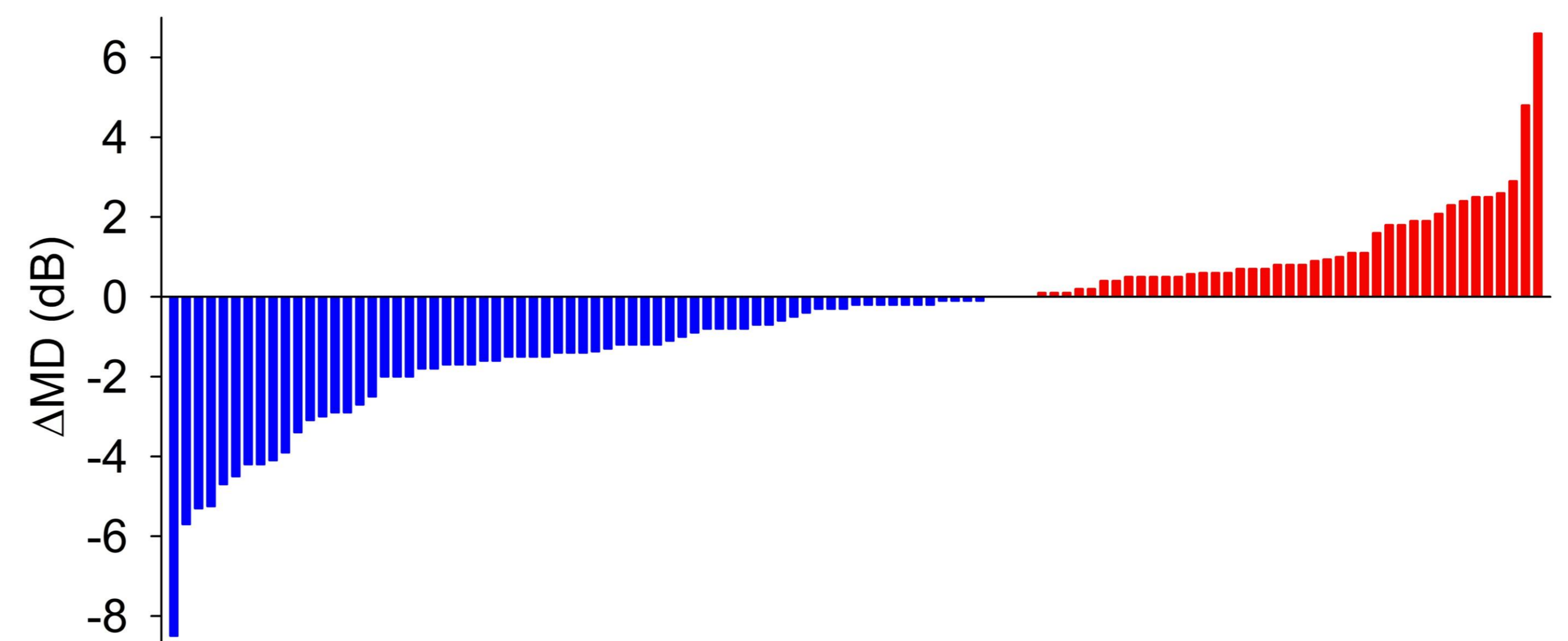
The MD change from PRE to POST amounted to  $-0.6 \pm 2.1$  dB ranging from -8.5 to 6.6 dB.

In 70 out of 111 eyes, MD change between 0 and -8.5 dB indicated a treatment response with a responder rate of 63%.

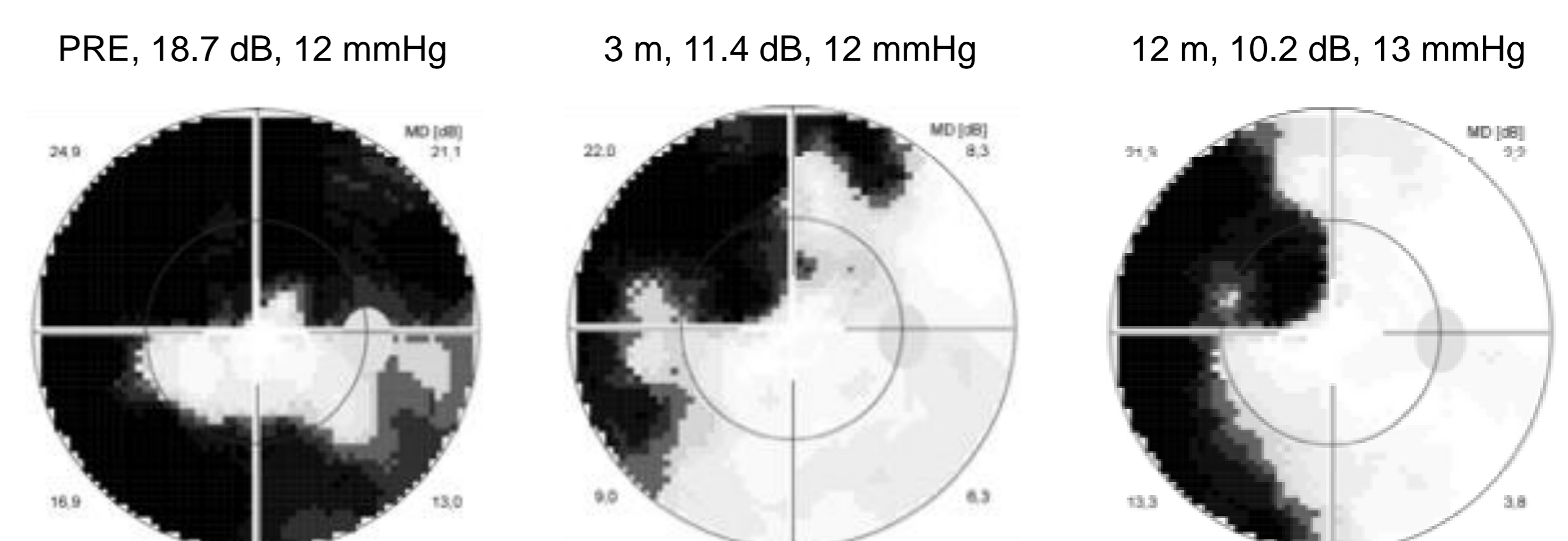
Significant MD reduction one year after ONS in 111 eyes



MD change in all 111 eyes one year after ONS



Visual field progress of the right eye in one patient with normal tension glaucoma over 12 months



### CONCLUSION

Innovative treatments that preserve visual function through mechanisms other than IOP lowering are required for glaucoma with progressive vision loss. The present long-term data document progression halt or even improvement of visual fields in 63% of affected eyes after ONS and, thus, extend existing evidence from clinical trials.

### REFERENCES

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