Preliminary Report

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Treatment of mild forms of blepharitis using direct plasma discharge

Keywords: meibomian glands, muco-aqueous component, keratograph Oculus, conjunctival hyperemia

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Introduction

The orifices of meibomian glands are non-ablatively stimulated by a direct plasma discharge. Thanks to this effect, contents of the meibomian glands are liquefied and their orifices are gradually released. Orifices open and thus release the secretary (meibum), which mixes with the muco-aqueous component of the tear film to ensure its better growth and quality.

Methods

Authors present clinical and optometric follow-up monitoring of patients with dry eye disease – his evaporative category due to associated meibomian gland dysfunction (MGD) (Figure 1). The cohort consisted of 20 patients (40 eyes) - 11 females and 9 males. All patients were examined on a slit lamp and keratograph Oculus. All patients had a standard slit-lamp biomicroscopic examination, tear film evaluation, and corneal topography. There was a tear meniscus height (TMH, meniscometry) measured in 3 positions (Figure 2). Lipid layer thickness (interferometry) and tear film stability (non-invasive keratograph TBUT - NIKBUT) were measured (Figure 3). Bulbar conjunctival hyperemia and limbus area were evaluated; meibomian gland observation (meibography) of both eyelids was done (Figure 4&5) and evaluated. Manual meibomian glands expression (the score of secretion characteristics, the score of the difficulty of lipid excretion) and fluorescein staining (Oxford grading scale) were evaluated. There was the control of eyelid orifices and lid condition done. Examination for Demodex parasite was performed. Examination of patients always took place before the plasma discharge treatment, then 1 week, 2 weeks, and 1 month after the treatment. All patients completed a Dry Eye Questionnaire (DEQ 5) before and after treatment. The treatment was performed with the medical device JETT PLASMA LIFT MEDICAL under sterile conditions and under an operating microscope using a gold applicator in local anesthesia. Treatment of both eyelids was always performed. The data were statistically evaluated.

Figure 1 The cohort consisted of 20 patients (40 eyes) - 11 females and 9 males.

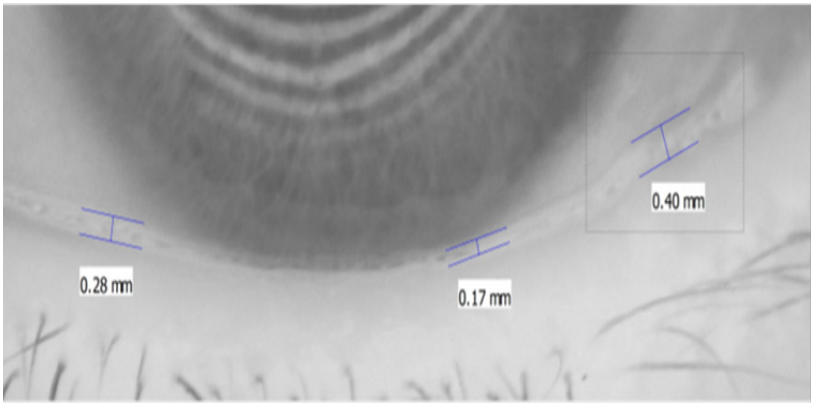

Figure 2 There was a tear meniscus height (TMH, meniscometry) measured in 3 positions.

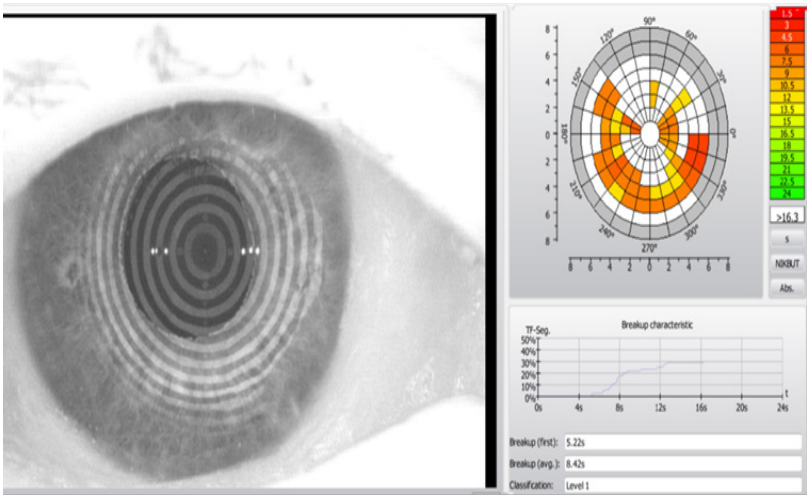

Figure 3 Lipid layer thickness (interferometry) and tear film stability (non-invasive keratograph TBUT - NIKBUT) were measured.

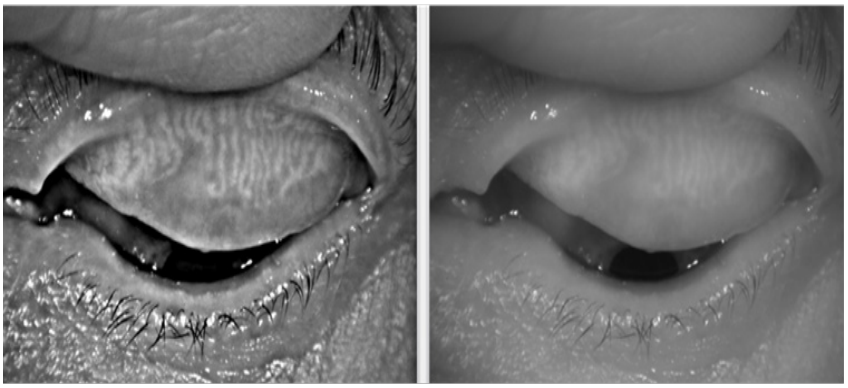

Figure 4 Bulbar conjunctival hyperemia and limbus area were evaluated.

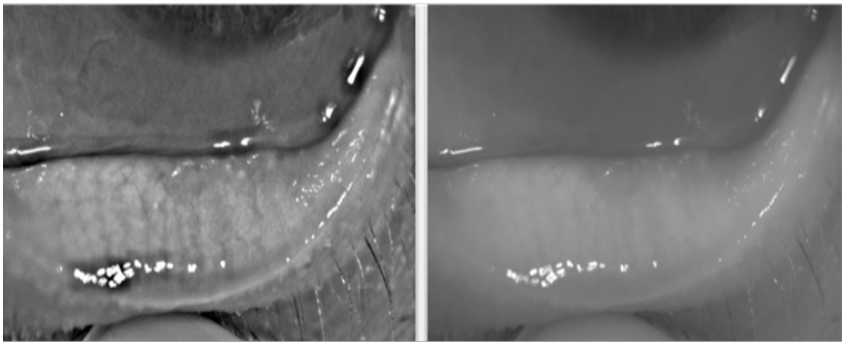

Figure 5 Bulbar conjunctival hyperemia and limbus area were evaluated.

Citation: Zemanova M, Macejova I, Svobodova I, et al. Treatment of mild forms of blepharitis using direct plasma discharge. *Adv Ophthalmol Vis Syst.* 2020;10(5):127–130. DOI: 10.15406/aovs.2020.10.00397

Results

Clinical efficacy was demonstrated by monitoring of patients with dry eye disease with posterior blepharitis (meibomian gland dysfunction - MGD) treated with plasma shock. Immediately after the treatment, the NIKBUT improves (Figure 6). However, during the follow-up period, NIKBUT returns almost to its original value (Figure 7). Other monitored topographic parameters and values in control measurements do not show a statistically significant improvement, except tear meniscus height in temporal region (Graph 1–3), After the plasma treatment, the condition of the margin of the eyelids is clinically improved mainly due to the liquefaction of the contents of the meibomian glands and easier expression of their contents (Figures 8&9). In 90% of cases in the cohort, there was a subjective improvement (less redness of eyes, less burning, itchy and scratchy, less pain and pulling sensation, less frequency of eye drop dripping) according to the completed questionnaire (DEQ 5). The remaining patients (10%) did not report improvement - their problems were the same as before treatment, they had to further heat the eyelids with warm compresses and leave one frequency in the dripping eye drops. No patient had an exacerbation of pre-existing problems. In some patients, treatment contributed to the discontinuation of previous topical steroid therapy. The limitation of our work is a small group of patients and a short follow-up period.

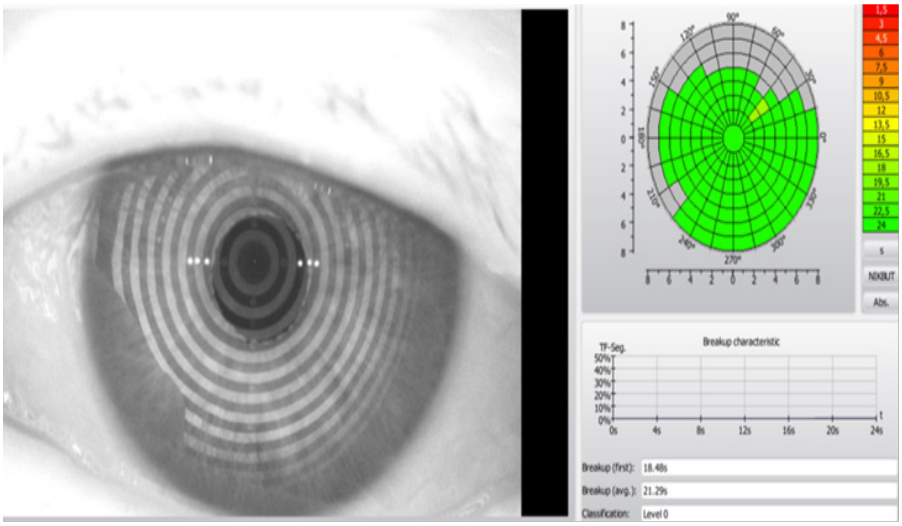

Figure 6 Improvment of NIKBUT.

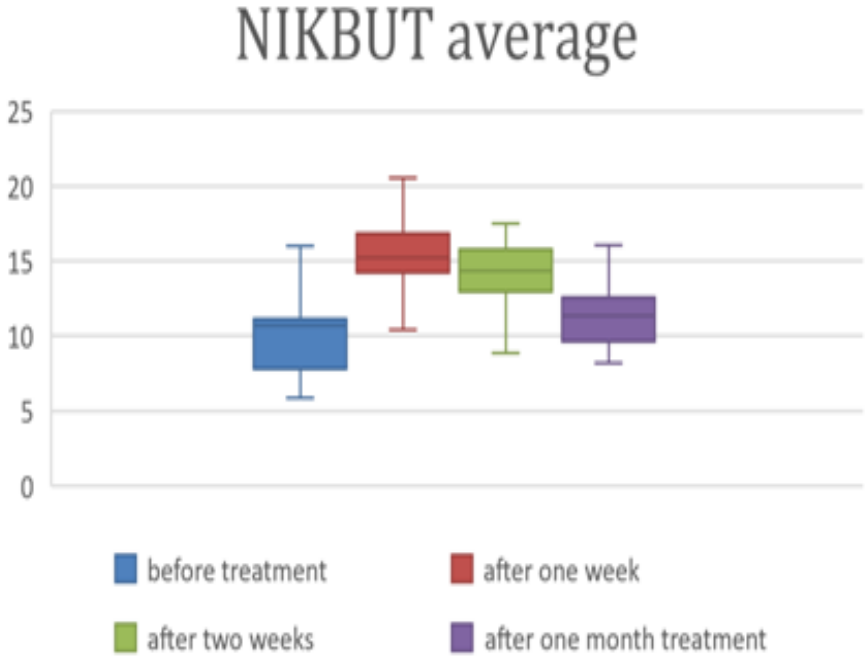

Figure 7 NIKBUT returns almost to its original value.

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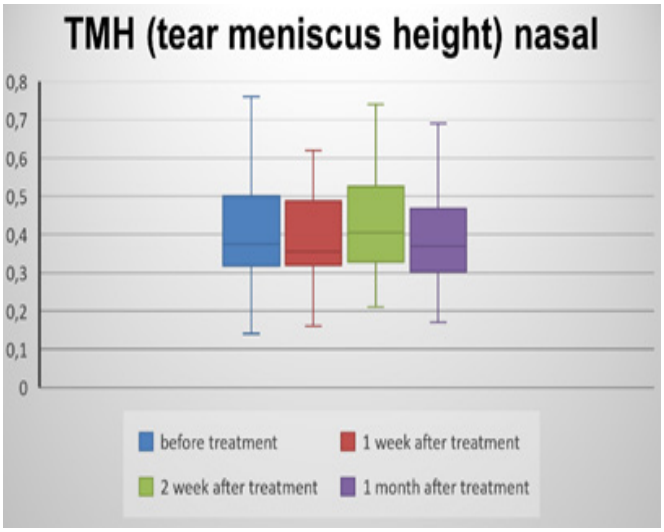
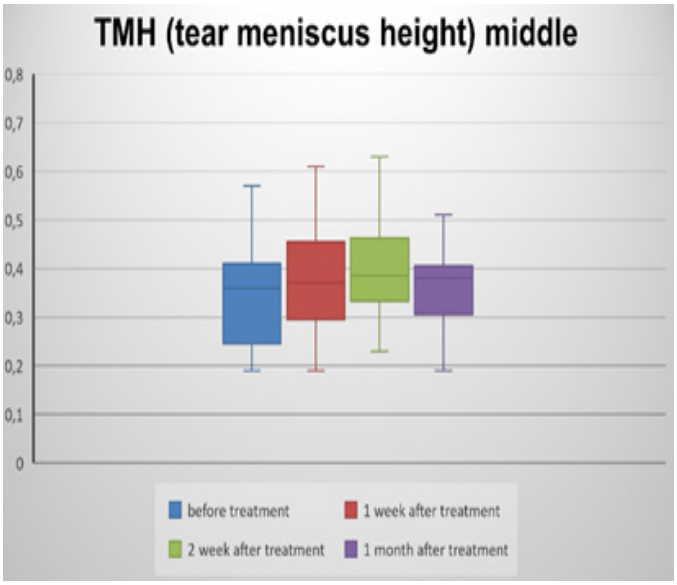
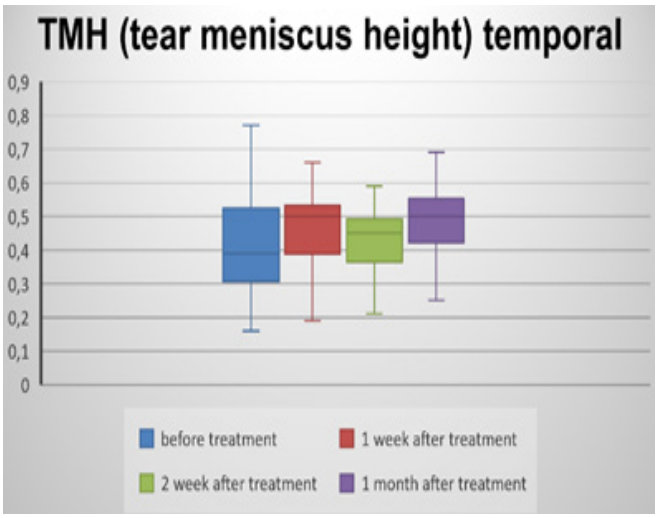


Graph 1 Average of NIKBUT.



Graph 2 Graph of TMH in middle position.



Graph 3 Tear meniscus height in temporal region.

Figure 8 The condition of the margin of the eyelids is clinically improved after the treatment.

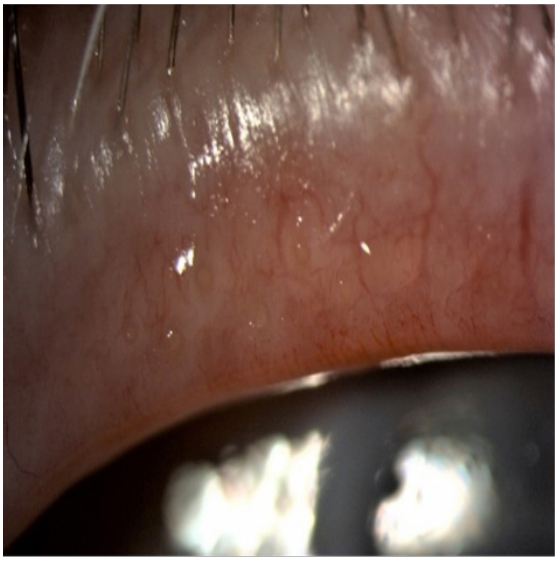


Figure 9 The condition of the margin of the eyelids is clinically improved after the treatment.

Conclusion

Plasma therapy using gold applicators offers a safe type of treatment for patients with a mild form of evaporative-type dry eye disease. The plasma discharge treatment should be repeated after 4 months for the best and maximum results. The method of plasma discharge treatment appears to be effective in the field of ophthalmology in other indications and is the subject of further studies.

Acknowledgments

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Conflicts of interest

Authors declare that there is no conflict of interest.

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