Immediate Effect of Plasma Spark Technology on Wrinkles

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ABSTRACT

Introduction: Since the 2000s, researchers have studied the biological effects of reactive oxygen and nitrogen species generated by plasma on fibroblasts and collagen, particularly using plasma jet or Dielectric Barrier Discharge. This research aimed to examine the effects of applying a plasma spark to reduce facial wrinkles.

Materials and Methods: A plasma spark device, manufactured by Plasma Fanavar Jam Company, was used for the treatment, and images were captured with a Visio face camera. Skin moisture, elasticity, and thickness of skin were measured using sonography and a multi-probe adapter system. Patients signed an informed consent form, and their photographs were taken before applying a topical anesthetic ointment. After 30 minutes, the treatment was performed on the lateral canthal and nasolabial lines using a dotting technique, along the length of the wrinkles. Post-treatment photographs and measurements were repeated immediately and at two-week intervals for a total of three follow-up sessions.

Results and Discussion: Plasma treatment reduced the thickness of the eyelid and nasolabial lines, measuring 20.81% and 22.29%, respectively. Additionally, changes in density were noted at 43.94% for eyelids and 35.6% for nasolabial lines, as measured by sonography. Colorimetry results showed improvements of 4.5% and 15.9% for both regions. These findings suggest that reactive oxygen species and heat have interacted with and influenced fibroblasts and collagen.

Conclusion: This study indicates that plasma treatment can help reduce wrinkles and improve skin smoothness over time, although an inflammatory response was observed immediately post-treatment.

Keywords: Face, Fibroblasts, Plasma, Rejuvenation, Spark

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