Abstract

Reawakening Fibroblast Function with Broadband Light: A Regenerative Dermatology Approach

Maylin Clinic. ILSAN, Hyoung Moon Kim, MD., PhD.

Introduction

Facial rejuvenation can be classified into three categories:

1. **Volume Reduction Rejuvenation**,
2. **Normal Volume Rejuvenation**, and
3. **Volume Enhancing Rejuvenation**.

High-intensity focused ultrasound (HIFU) with high energy settings typically achieves volume reduction, while filler injections or fat grafting are standard techniques for volume enhancement. Broadband Light (BBL) therapy, particularly when using energy settings beyond 800 nm, has the potential to contribute to both normal-volume maintenance and volume enhancement. To assess treatment efficacy and patient satisfaction, we conducted a retrospective analysis.

Methods

We performed BBL treatments using wavelengths above 800 nm (cartilage-only targeting mode) on 80 patients in 2024. Each patient received 10,000 J per side of the face (total of 20,000 J). Patients who underwent combination therapies or had significant hyperpigmentation or erythema were excluded. Only cases focused on rejuvenation goals—skin tightening and fine wrinkle improvement—were included. We assessed medical records, before-and-after photographs, and GAIS (Global Aesthetic Improvement Scale) scores after 10 treatment sessions.

Results

The male-to-female ratio was 98% to 2%, with a mean patient age of 48 years. GAIS evaluations revealed that 50% of patients rated their improvement as “Improved” (score 3), and 40% as “Much Improved” (score 2). No patients reported dissatisfaction, and no serious adverse effects occurred. The average treatment time was 7 minutes. Image analysis indicated that 70% of cases achieved normal-volume rejuvenation, while 30% showed volume enhancement effects.

Discussion

Fibroblasts, known for their low baseline activity, require stimulation to promote skin rejuvenation. In this study, BBL may have activated not only dermal fibroblasts but also endogenous stem cells within the subcutaneous fat layer, contributing to volume enhancement in approximately 30% of patients. Further large-scale, prospective studies are needed to confirm these findings and elucidate the mechanisms of stem cell activation.