

Fractional technology: a review and clinical approaches.

Introduction

Energy-based systems have evolved greatly over the past several years, and many new medical devices have been introduced into the dermatologist's armamentarium, some of which are truly revolutionary. Fractional photothermolysis, or fractional technology (FT), has become one of the hottest buzz topics in laser medicine and surgery over the past several years. Almost all of the medical device companies in the field of dermatology have developed, or are in the process of developing, an FT-type device. Each company will explain to you why their device is better than the others. In an effort to better clarify the options, I will review the various FT devices, giving as much data as possible, and explain my approach toward selecting the mode of treatment for candidates for FT.

History and Conceptualization

The concept of FT was first described by Huzaira and his colleagues in 2003. (1) A year later, it was further elucidated by Manstein et al. (2) FT was developed as a way to achieve results closer to ablative laser clinical outcomes--the gold standard in facial rejuvenation (ie, C[O.sub.2] laser)--but with less patient downtime. Unfortunately, the C[O.sub.2] laser modality has had several adverse events, which has made the regular use of ablative modalities diminish over the past 5 years. These adverse events included up to 4 weeks downtime or longer in some cases, along with increased risks of infection, pigmentary changes, and scarring. Post-C[O.sub.2] hypopigmentation can be seen as long as several years after the original procedure.

FT was developed to improve upon other nonablative laser techniques which anecdotal evidence has shown to be efficacious, although it is sometimes hard to prove through clinical trial. These have included, but are not limited to, intense pulsed light (IPL), pulsed dye lasers (PDLs) at 585 to 595 nm, potassium-titanyl-phosphate (KTP) lasers at 532 nm, and a variety of midinfrared laser systems ranging from 1319 to 1320 nm and 1450 to 1540 nm. For the most part, patients have seen positive results with most of these devices, although sometimes it is hard for the clinician to appreciate and document the subtle changes that may occur.

FT devices produce an injury pattern to the skin with skip areas repeated over and over. During healing, FT promotes an improvement in the tone and texture of the skin, smoothing lines and wrinkles, and can also treat pigmentary concerns such as melasma. There is also improvement in scars, especially acne scars. The devices vary in the way they produce their injury patterns, wavelength, and intensity. Some of the devices produce their injury through an intact epidermis, while others produce both epidermal and dermal injury. The merits of each are actively debated and beyond the scope of this column. Clearly, from a clinical point of view, both ideas seem to work well. It will be up to the clinician to determine which modality works best in their clinical setting. Table 1 lists the FT devices currently available.