

Research Article

Why I Traded My CO₂ Laser for Fractionated Radiofrequency Machine in My Practice? My Experience in The Skin of Color

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This article will shed light on the theoretical and methodological perspective on the issue of the superiority of an ablative fractional radiofrequency device over to older more ablative devices like CO₂ laser. In depth analysis of advantages and scope of improvement of the technology is the aim behind the authoring of this commentary.

Introduction

The newly emerging technology of Ablative Radiofrequency Resurfacing has been around for a few years now. But what caught my attention was the ability to deliver the energy in a Fractionated manner. Constant inventions have made it possible to re-visit and re-invent this technology to help it gain its ground in the global market for energy based rejuvenation devices.

Discussion

The machine I am using is Duet RF (EunSung Global Corporation, South Korea). The aforesaid technology of Ablative Fractional Radiofrequency Resurfacing has been successfully employed by me in the treatment of large pores, oily skin, wrinkles, acne scars, texture and stretch marks. This multi-modal application of the technology has helped me to rediscover and find newer and safer ways of using it. The Radiofrequency does not have a target chromophore and unlike the laser, it can be used with a greater degree of safety and flexibility in the skin of color. The very notion of a “Colorblind Machine” helps to get past the most common and dreaded side effect of “Post-Inflammatory Hyperpigmentation” which is very common at the same time quite difficult to treat when we use contemporary technologies like a fractionated CO₂ laser.

If I were to grade the skin conditions in the ascending order of the power band of treatment, it would be as follows – large pores < wrinkles < laxity < scars ; pores needing a minimal energy and scars needing a deeper maximal energy approach. This is however only after clinically stabilizing the ongoing dermato-pathological processes. Clearly there is a “Spatial” and a “Depth” related phenomenon that needs a careful understanding. It is imperative to say there is a tunable balance between ablation and coagulation/necrosis. This multi-factorial approach needs to be understood individually.

Fluence or power delivered was the single most important factor for many years. Newer working dynamics came to existence. A directly proportional relationship existed. But with the introduction of different treatment tip sizes and the fractional technology, the relation became more precise and hence controllable. For example, now it was possible to deliver huge energy at just the epidermal level for resurfacing without much deeper dermal interference.

Lesser the distance between the electrode tips, the more

superficial is the level of power delivery. Meaning to say, a 196-pin tip has a superficial level as opposed to a 64 pin tip, keeping the other parameters constant. The energy density translated as tissue dispersion equal to half the distance of individual electrode pins. The concept of pulse width as used in tunable lasers was applied with a similar advantage. This was of help particularly in scenarios where a “sustained” bulk heating was needed without much drop in the peak power output as for example in skin tightening.

The arrival of the concept of a fractional delivery of power brought alongside an understanding of multiple passes during a particular procedure. This was of use in stacking power in a tight space without compromising on safety. Acne scars found a useful application to this extent. But more passes meant lesser comfort for the patient in addition to just the fluence as was the case earlier. The heat transfer was now more predictable and this led to happier patients and a rapid increase in the “lunch-time” or “office” procedures, or so to speak.

There has been a paradigm shift in the concept of energy based devices over a couple of decades. More emphasis has been given to “safety” as opposed to the “total power” which is being replaced by “actual usable power output delivery” of the machine for all practical purposes. In these “Downtime Centric” treatment scenarios, people now prefer multiple sittings as opposed to fewer sittings with significant downtime. The problem of large pores is predominantly more in the tropics for men and women alike. I recommend a 100 pin tip size with an effective 300 to 450 microns of tissue involvement. Keeping total passes to 2 with an 5% overlap would ensure a most comfortable experience to the patient.

In more challenging cases like acne scars for which I use Goodman & Baron Global Qualitative Acne Scar Grading System; atrophic scars need a more superficial approach whereby keeping the pass count to a minimum with no overlap and a moderately high RF power maximizes the results achieved. Deeper scars require a deeper and an isometric delivery of power hence a lesser pin count is used to deliver RF energy. High RF fluences with upto 30-40% overlap are

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important. If a choice has to be made between the percent overlap and pulse width, definitely a scenario with a lesser overlap and a sustained energy delivery is preferred for safety and comfort of the patient.

The unique possibility of a multi-layered approach of power delivery to atrophic scars, chicken pox scars and various other superficial scars with Fractional Ablative Radiofrequency is superior as compared to Micro-Needling Radiofrequency just for the simple fact of being more customizable, lesser downtime and much lesser consumable cost. With that said let me point out to another advantage of re-usable tips as opposed to disposable micro-needling tips (of preset shot count) in developing countries like India where import duties are high and the cost of consumables is a direct threat to patient compliance. The critics might argue that the micro-needling RF With can be used for micro-needling only as a part of MCA (Multi-Trepannic Collagen Actuation) Scar Therapy aka Dry Tattooing; but in my defense it translates to an increased consumable cost which sometimes is a deal breaker specially when we are looking at multiple treatments.

Conclusion

The non-ablative radiofrequency has been well accepted across

the world for skin tightening, fat burning and other similar aesthetic procedures. With the advent of ablative and more recently fractional technology, it is now possible to target the surface etiologies in a safer way without compromising the end result. An additional advantage of using such a machine is deeper dermal heating and remodeling.

Author's Perspective – My views about a Power Vs Precision outlook is justified in the modern day “Downtime Centric” scenario of energy based aesthetic devices. The power if applied too much defeats the whole purpose. With the fractionation of power, the power delivery becomes safer and more predictable. In my aesthetic practice today, I see more people who want combination treatments for better and faster results. The fractional radiofrequency technology is applied with a combination of treatments like Platelet Rich Plasma (PRP), Mesotherapy, and Topical Neutraceuticals to maximize the results. The downtime on these treatments is much less in comparison to the older generation of more ablative energy based devices, without compromising on the results. The power is a multi-factorial phenomenon in the aforesaid technology and understanding its every aspect and weighing it against the predictive outcome holds the key to a successful treatment and happy patients.