JOJ Dermatology & Cosmetics
ISSN: 2689-4610

Juniper Publishers
key to the Researchers

Review Article
Volume 6 Issue 1 -March 2024
DOI: 10.19080/JOJDC.2024.06.555676

JOJ Dermatol & Cosmet

Improving Patient Conversations in the Choice Between Radiofrequency Microneedling and Facelift Procedures for Optimal Facial Skin Laxity Enhancement

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Submission: January 31, 2024; **Published:** March 28, 2024

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Abstract

Optimal management of facial skin laxity requires a nuanced approach by providers working in aesthetics and cosmetics. While radiofrequency technology has become an emerging option for specific candidates, this paper highlights the importance of navigating patient-specific demographics and future considerations when tailoring an effective individualized treatment plan by improving patient-provider dialogue.

Keywords: Radiofrequency Microneedling; Morpheus; Facelift; Patient Education; Cosmetic Dermatology

Abbreviations: RF: Radiofrequency; SMAS: Superficial Musculoaponeurotic System

Introduction

RF microneedling devices, such as Morpheus, have been rising in popularity due to its nuance ability to fill a treatment gap for patients who are too young for a facelift, those who already have undergone a previous facelift, and individuals looking for noninvasive alternatives.[1] The option for dual treatment modes on these new devices have made it even more customizable for individualized patient treatment plans and is becoming more commonly used in enhancing patient results following surgical facelifts [1]. To treat the skin, RF microneedling utilizes low-frequency electromagnetic waves to create an electromagnetic field that thermally heats the dermis and hypodermis via an alternating current [2]. Introduction of controlled microtraumas to the skin via microneedling creates a focal post inflammatory chemical cascade generating nucleogenesis, elastin production, angiogenesis, and in turn, skin tightening [3]. RF is then introduced after micro punctures are made into the skin and delivered at the tips of the microneedles to thermally heat the dermis and hypodermis to create collagen denaturation and subsequent contraction of tissue for skin tightening benefits [4,5].

There remains little long-term evidence of patient outcomes with use of RF microneedling prior to surgical facelifts as RF microneedling treatment prior to an elective facelift may interfere with optimal facelift results due to excessive skin tightening, scarring and damage of the dermis. This emphasizes the importance of pre-treatment patient education about expectations and adverse effects if RF microneedling is being utilized on a patient who is considering a facelift in the future. When considering therapy RF microneedling, specific patient populations should be considered when discussing treatment options as certain age groups and specific jowl laxity areas have been shown to experience better outcomes with facial surgery. Due to the complex interplay between undergoing a surgical facelift or RF microneedling, this paper seeks to highlight important discussion points for cosmetic providers to incorporate with their patients regarding risks and

benefits of both treatment modalities and the possible detriments of RF microneedling prior to a potential future surgical facelift.

RF Microneedling Related Risks and Considerations for Future Elective Facelift Procedures

As RF microneedling devices introduce repeated and organized microneedling into the skin, the varying depths of puncture become important because the depth relates to targeted tissues for treatment. Microtraumas introduce a targeted mechanism of repair to exclude highly associated cellular inflammatory cascades, and instead are driven through a less inflammatory cascade like TGF-B3, known to lead to fibroblast migration and deposition within the collagen matrix [6]. Platelet derived growth factor (PDGF), fibroblast growth factor (FGF), and epidermal growth factor (EGF) are all released focally in response to the device's microneedling, allowing a robust team of signaling to contribute to natural skin tightening via angiogenesis, collagen deposition, and rejuvenation [7].

Such intervention has been proven to be effective by increasing elastin collagen deposition by 400% after four one-month apart treatments [8]. When needle length is taken into consideration, the activation of such cascades relates directly to the length of the needle; as needle length increases, the expected skin rejuvenation will target deeper regions than a common target, the papillary layer of the dermis. Understanding this mechanism of action is critical for providers educating patients in their laxity results. When RF is added to microneedling, the epidermis is also bypassed as RF is passed through the hollow needle to the tip and transmits higher degrees of radiofrequency and thermal energy to targeted tissues causing denaturation of undesired collagen to allow contracture and similar rejuvenation cascades as microneedling.[5] This combination of microneedling with RF allows adjunctive therapies to further accomplish improved skin laxity and wrinkle repair.

Though evidence shows stark improvement with noninvasive modalities like Morpheus, the mean laxity improvement achieved through a single fractional bipolar treatment amounted to 37% of that attained through a surgical facelift, suggesting that multiple sessions must be considered if one expects dramatic improvement [9]. Repeated treatments do carry limitations in overtreatment leading to fibrosis of the skin, specifically the papillary dermis [10]. Reports have also documented other common complications include hyper- or hypopigmentation of treated skin, thermal burns, blistering, and scarring; these complications can often be mitigated with proper technique and settings of equipment to assure appropriate depth of needle placement, for example [11].

Treatments targeting multiple layers including the dermis and hypodermis theoretically should lead to optimal skin tightening results, however it proposes a new consideration as to whether it presents as a future obstacle for patients seeking a later elected surgical facelift. The surgical approach to facelifts resides in manipulation of the anatomical structure called the superficial musculoaponeurotic system (SMAS), an intricate fibrofatty layer of connective tissue that is continuous with the superficial cervical fascia, connected to the platysma muscle inferiorly and the galea superiorly. It plays an integral role in the anatomic relation of superficial dermis to underlying facial muscles. Just beneath this layer, the SMAS has a complex relation with deep ligaments and connections that limit mobility of superficial structures that are crucial to relieve during SMAS to generate the most optimal movement for desired facelift outcomes of skin tightening [12].

There are two distinct SMAS compositions given anatomic regions, and the abrupt junction of differing compositions resides at the nasolabial fold region where medially, there are less fat lobules and a more direct connection of SMAS to the superficial dermis as muscle fibers are seen to extend superficially into the dermis.[12] However, the other regions of SMAS lateral to the nasolabial fold still carry the same properties of communication of facial muscle to skin by muscle tendon fibers connecting both regions via SMAS communication [13]. This sophisticated relationship of neighboring structures proposes question if deep penetration and treatment with modalities such as Morpheus modulates these fibrous connections of facial compartments and, in turn, presents surgical challenges when attempting to dissect the connective tissue to achieve a natural glide of overlying tissue planes. Suspected surgical complications can therefore include but are not limited to difficult tissue dissection via both blunt or sharp, damage to neighboring tissue in attempt to create natural gliding planes, dermal adhesions, nerve damage, and dimpling of skin post-operatively.

Although further investigation is warranted of an optimal timeframe to undergo a surgical facelift prior to treatment of RF microneedling, there is physiological benefit of undergoing RF microneedling after a surgical facelift. This order of treatment theoretically offers better aesthetic outcome since the addition of both microtraumas and radiofrequency to the deep skin layers introduces the added benefit of skin tightening after surgical removal of unwanted, hypoplastic skin. Though the timeframe between primary intervention with facelift to secondary intervention of RF and microneedling is unclear, RF microneedling can be used as either an immediate adjunctive therapy after facelift or as a method to combat skin laxity at the patient's discretion for correction [14]. The physiologic interplay and timeline between RF microneedling and a surgical facelift require consideration of each modality's effect on future interventions by aesthetic providers with their patients to be able to determine the most optimal plan and outcome for patients seeking improved facial skin laxity.

Important Patient Demographics for considering RF Microneedling Treatment

A previous study analyzing the complexity between a surgical facelift and Morpheus revealed a 46% improvement in skin laxity relative to baseline with a surgical facelift alone, as opposed to only

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a 16% improvement from monotherapy with fractional bipolar RF. This disparity shows the need to educate patients about the varying results associated with each treatment. Moreover, a nuanced understanding of these results becomes crucial when also addressing patient demographic factors, such as age, as the efficacy of these treatments may vary across different age groups.[1] It is critical for esthetic providers to go beyond managing result expectations, but also address patients' age. Microneedling with RF has become a valuable option for bridging treatment gaps in individuals who are too young to undergo a surgical facelift; however, research indicates that patients above 55 years of age were likely to experience more skin tightening from RF microneedling compared to their younger counterparts.

This knowledge prompts early discussion for cosmetic providers to address potential benefits and risks of undergoing dual RF and microneedling treatment at different ages, especially the younger population. In addition to considering a patient's age, premature neck and jowl laxity is also a common concern among patients seeking treatment for skin laxity. Patients with abundant subplatysmal fat should be properly identified and counseled that RF procedures do not adequately address this layer and their concerns may be better managed with surgical interventions such as liposuction. For patients with pronounced skin laxity, it is critical for cosmetic providers to recommend a surgical facelift, as application of heat and loss of fat without skin excision may potentially exacerbate their current condition or impair future facelift results due to scarring.[11] Navigating this domain demands special considerations to achieve the most optimal outcome.

Discussion

The introduction of RF Microneedling brings forth a new treatment method that warrants additional consideration, as this treatment has the potential to impact future facial rejuvenation treatment outcomes. This calls for a new approach to patient-provider discussion to encompass detailed dialogue on the nuances of each procedure to improve pre-treatment consultation, patient education, and optimal results. This includes providing comprehensive counseling on potential suboptimal facelift outcomes when choosing RF treatment beforehand, as the compounded impact of scarring, dermal abrasions and tissue damage can negatively influence results of a future facelift. Additionally, providers should address the limitations of RF to effectively target jowl laxity and set realistic expectations regarding RF results in patients under the age of 55. Addressing these nuances not only ensures optimal results but also establishes a foundation for open dialogue on potential outcomes and limitations. Further research is still required to extend the investigation into the cumulative effects of Morpheus on the efficacy of facelift procedures over time. As new modalities emerge and technologies undergo continual changes, it is imperative for all providers in the field of aesthetic and cosmetic medicine to be well-informed about these findings to guarantee accurate education for patients undergoing either or both procedures.

Conclusion

Cosmetic providers trained in Morpheus and/or facelift procedures should consider this new technology when discussing different options of facial rejuvenation. Factors to weigh in these considerations should include, but are not limited to, age-related expectations, differentiations between each monotherapy, and the potential impact of dual Morpheus treatment and subsequent facelifts. By addressing these differences, providers can enhance the overall quality of the decision-making process for patients seeking facial rejuvenation treatments.

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How to cite this article: Olnita M, Alexa C, Mia P, Rebecca B, John T. Improving Patient Conversations in the Choice Between Radiofrequency Microneedling and Facelift Procedures for Optimal Facial Skin Laxity Enhancement. JOJ Dermatol & Cosmet. 2024; 6(1): 555676.
DOI: 10.19080/JOJDC.2024.05.555676

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