

Case Report

Topical Recombinant Collagen Following Fractional Radio Frequency Microneedling for Nonsurgical Facelift: Case Report

Thien-Chong Marcus Wong^{1*}, MBBS, MMed, MRCS; Yizhi Ong^{2*}, MBChB, MSc

¹Wong's Plastic Surgery Centre, Gleneagles Hospital, Singapore, Singapore

²Department for Continuing Education, University of Oxford, Oxford, United Kingdom

*all authors contributed equally

Corresponding Author:

Yizhi Ong, MBChB, MSc
Department for Continuing Education
University of Oxford
Rewley House, 1 Wellington Square
Oxford OX1 2IA
United Kingdom
Phone: +44 7428612914
Email: kingsfieldong@gmail.com

Abstract

Background: Fractional radio frequency microneedling (FRM) is an effective nonsurgical facelift modality supported by growing clinical evidence. While generally well tolerated, postprocedural erythema, pain, swelling, and bruising typically last up to 7 days. Other serious complications include prolonged swelling, infection, persistent grid mark, burns, and hypo- or hyperpigmentation. Recombinant human collagen has demonstrated potent wound-healing and anti-inflammatory properties, which could be harnessed for post-FRM recovery.

Objective: To date, there is a lack of published studies evaluating the use of topical agents to improve postprocedural recovery following FRM. This case report describes the early experience of using topical recombinant collagen post FRM for nonsurgical facelift.

Methods: Two 40-year-old female patients with Fitzpatrick skin type IV underwent FRM for nonsurgical facelift. The procedure was performed with standard energy settings. Immediately post procedure, topical recombinant collagen was applied to the treated areas. Either clinical photography or cross-polarized imaging was used to objectively capture the changes in facial erythema and swelling.

Results: Both cases demonstrated a marked reduction of erythema and inflammation within 1 to 2 hours after application of topical recombinant collagen. These observations appeared earlier compared to the typical timeframe of 1 to 3 days. No adverse events were reported.

Conclusions: Topical recombinant collagen application post FRM was associated with an early reduction of skin erythema and inflammation.

JMIR Dermatol 2026;9:e86892; doi: [10.2196/86892](https://doi.org/10.2196/86892)

Keywords: recombinant human collagen; postprocedure recovery; fractional radio frequency microneedling; wound healing; nonsurgical facelift

Introduction

In recent years, fractional radio frequency microneedling (FRM) has become a widely recognized and highly effective nonsurgical facelift treatment [1-3]. Studies have shown that it is a useful modality for skin tightening and dermal

remodeling without the risks associated with invasive surgery [1-3]. For FRM, controlled thermal energy via microneedles is delivered into the dermis, inducing microinjury to stimulate neocollagenesis and elastin production [1-3]. Although its clinical efficacy and tolerability have been well documented, postprocedural erythema, edema, bruising, and discomfort are

common and may persist for up to several days [4]. Other rare but serious complications that have been observed include prolonged swelling, persistent grid marks, burns, infection, and hypo- or hyperpigmentation [4].

Currently, no standardized postprocedural care protocol has been established to accelerate recovery and reduce downtime [4], underscoring the unmet clinical need for biologically active adjuncts that support tissue repair and reduce inflammation. Recombinant human collagen is an emerging innovative biomaterial that has shown promising potential for improving wound healing while minimizing inflammation [5-8], which could be harnessed for post-FRM recovery following energy-based facial rejuvenation procedures. To our knowledge, the use of topical recombinant collagen in the immediate post-FRM setting has not been described in the medical literature. Herein, we describe an innovative postprocedure approach using topical recombinant collagen in two patients who underwent a nonsurgical facelift with FRM.

Case Presentation

Overview

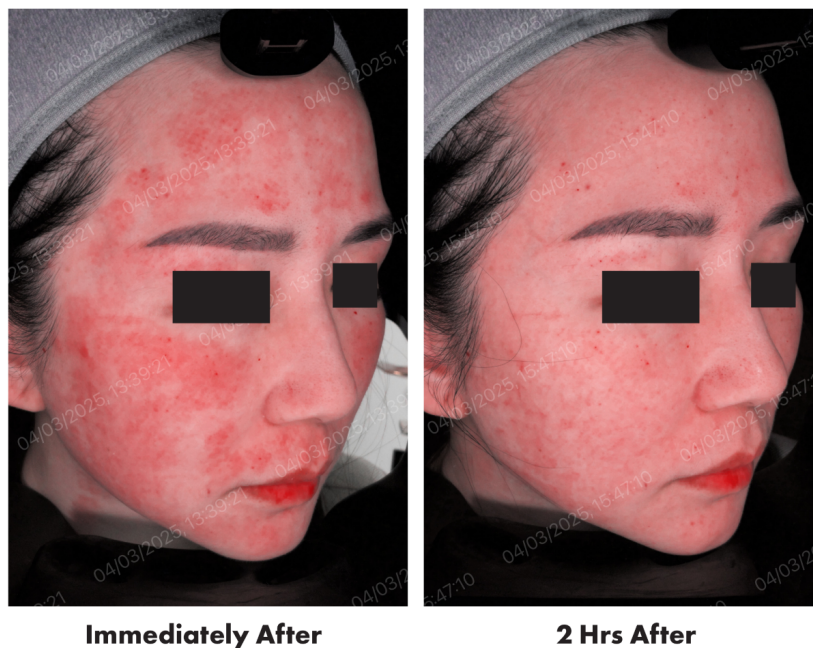
Two 40-year-old female patients with Fitzpatrick skin type IV presented with facial laxity and underwent FRM for nonsurgical facelifting. Both were nonsmokers, with no significant past medical history or drug allergies. The baseline assessment documented mild-to-moderate facial laxity with fine lines around various parts of the face. Standardized

clinical photography under consistent lighting or cross-polarized imaging was performed before treatment, immediately after treatment, and 1 to 2 hours after treatment. The procedure was performed using a 24-pin tip in a fixed mode, with two passes and 35% to 50% overlap. They received a total of approximately 600 pulses each with standard energy settings of 20 to 25 mJ at a 2.0 mm depth for facial bony areas and 30 to 45 mJ at a 3.0 to 4.0 mm depth for facial soft tissue regions. Immediately post procedure, topical recombinant collagen was applied to both patients as part of their routine posttreatment care. The multimodal documentation showed early observable changes in erythema and inflammation within 1 to 2 hours after application of topical recombinant collagen. Case 1 demonstrated a clinically significant reduction in facial edema and erythema (Figure 1) that was observed on clinical photography within 1 hour post treatment. Additionally, the patient reported immediate soothing of skin discomfort and burning sensation after application of topical recombinant collagen. Case 2 showed a marked reduction of inflammation (Figure 2), visualized using a 3D skin analyzer under cross-polarized light within 2 hours post treatment. Subjectively, the patient reported rapid relief of skin redness and irritation after application of topical recombinant collagen. No adverse events or side effects were reported. The procedure and posttreatment care were well tolerated by both patients. During the follow-up review, both patients were satisfied with the treatment and rapid recovery results. The CARE Checklist has been completed for the drafting of this case report.

Figure 1. Clinical photography under standard lighting capturing apparent reduction in facial erythema and edema within 1-hour post fractional radio frequency microneedling.



Figure 2. Marked improvement of skin inflammation visualized by a 3D skin analyzer under cross-polarized light within 2 hours post fractional radio frequency microneedling.



Ethical Considerations

This case report did not require institutional ethics review according to the National Healthcare Group Domain Specific Review Board guidelines, as it describes observations from routine clinical care without systematic research intervention.

Written informed consent was obtained from the patients for publication of this case report and any accompanying images.

Discussion

This novel case report has shown that topical recombinant collagen applied immediately post FRM was associated with clinically apparent reduction in erythema, edema, and discomfort within 1 to 2 hours post treatment as compared to the expected 1 to 3 days [1-3]. The temporal relationship between the application of topical recombinant collagen and the earlier-than-expected postprocedural reduction in erythema and inflammation could represent a plausible effect superimposed on the normal recovery process. The reduction in skin erythema was apparent to the attending clinician, which was notably different from the typical recovery trajectory of FRM. The observed objective and subjective improvements suggest that topical recombinant collagen may be a feasible adjunct for postprocedural care following FRM. Collagen-based biomaterials have been shown to promote

wound healing, stabilize the extracellular matrix, and reduce inflammation in both acute and chronic wounds [5-7]. While previous studies have largely focused on burns or surgical wounds [5-7], our findings have extended the potential application of recombinant collagen to aesthetic procedures involving controlled dermal injury from FRM. This early clinical experience corroborated with known in-vitro dermal repair and anti-inflammatory mechanisms of recombinant collagen, including the modulation of inflammatory cytokines such as inducible nitric oxide synthase, interleukin 1 β (IL-1 β), IL-10, and tumor necrosis factor α [9]. Post-procedural downtime is an important consideration. These preliminary observations warrant further investigation into strategies to support recovery following FRM.

Nevertheless, this report has several limitations. Only two patients were included with short-term follow-up. There was no control group for comparison. No standardized scoring systems for erythema, swelling, or patient-reported outcomes were used, as this was not part of routine clinical documentation. Randomized controlled studies will be required to confirm treatment safety and efficacy while optimizing treatment protocols before routine implementation.

In summary, topical recombinant collagen may represent a potential adjunct in postprocedural care following FRM, warranting further evaluation in prospective clinical trials.

Funding

This study was not supported by any sponsor or funder.

Data Availability

All data generated or analyzed during this study are included in this published article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest

None declared.

References

1. Tan MG, Jo CE, Chapas A, Khetarpal S, Dover JS. Radiofrequency microneedling: a comprehensive and critical review. *Dermatol Surg.* Jun 1, 2021;47(6):755-761. [doi: [10.1097/DSS.0000000000002972](https://doi.org/10.1097/DSS.0000000000002972)] [Medline: [33577211](https://pubmed.ncbi.nlm.nih.gov/33577211/)]
2. Dayan E, Rovatti P, Aston S, Chia CT, Rohrich R, Theodorou S. Multimodal radiofrequency application for lower face and neck laxity. *Plast Reconstr Surg Glob Open.* Aug 26, 2020;8(8):e2862. [doi: [10.1097/GOX.0000000000002862](https://doi.org/10.1097/GOX.0000000000002862)] [Medline: [32983756](https://pubmed.ncbi.nlm.nih.gov/32983756/)]
3. Flegontova E, Kreindel M, Vranis NM, Mulholland RS. Correction of age-related changes in the skin at the dermal and subdermal level using radiofrequency macroneedling therapy. *J Cosmet Dermatol.* Jul 2024;23(7):2401-2410. [doi: [10.1111/jocd.16361](https://doi.org/10.1111/jocd.16361)] [Medline: [38778550](https://pubmed.ncbi.nlm.nih.gov/38778550/)]
4. Shauly O, Marxen T, Menon A, Gould DJ, Miller LB, Losken A. Radiofrequency microneedling: technology, devices, and indications in the modern plastic surgery practice. *Aesthet Surg J Open Forum.* Nov 6, 2023;5:ojad100. [doi: [10.1093/asjof/ojad100](https://doi.org/10.1093/asjof/ojad100)] [Medline: [38887534](https://pubmed.ncbi.nlm.nih.gov/38887534/)]
5. Mathew-Steiner SS, Roy S, Sen CK. Collagen in wound healing. *Bioengineering (Basel).* May 11, 2021;8(5):63. [doi: [10.3390/bioengineering8050063](https://doi.org/10.3390/bioengineering8050063)] [Medline: [34064689](https://pubmed.ncbi.nlm.nih.gov/34064689/)]
6. Chattopadhyay S, Raines RT. Review collagen-based biomaterials for wound healing. *Biopolymers.* Aug 2014;101(8):821-833. [doi: [10.1002/bip.22486](https://doi.org/10.1002/bip.22486)] [Medline: [24633807](https://pubmed.ncbi.nlm.nih.gov/24633807/)]
7. Sundar G, Joseph J, C P, John A, Abraham A. Natural collagen bioscaffolds for skin tissue engineering strategies in burns: a critical review. *Int J Polymeric Mater Polymeric Biomater.* Mar 24, 2020;70(9):593-604. [doi: [10.1080/00914037.2020.1740991](https://doi.org/10.1080/00914037.2020.1740991)]
8. Ben C, Liu X, Shen T, et al. A recombinant human collagen hydrogel for the treatment of partial-thickness burns: a prospective, self-controlled clinical study. *Burns.* May 2021;47(3):634-642. [doi: [10.1016/j.burns.2020.01.006](https://doi.org/10.1016/j.burns.2020.01.006)] [Medline: [33402311](https://pubmed.ncbi.nlm.nih.gov/33402311/)]
9. Hu C, Li K, Li L, et al. Recombinant human collagen injection ameliorates skin photoaging via immunoregulation and collagen production. *Collagen Leather.* Jul 2, 2025;7(22):1-18. [doi: [10.1186/s42825-025-00203-y](https://doi.org/10.1186/s42825-025-00203-y)]

Abbreviations

FRM: fractional radio frequency microneedling

IL-1 β : interleukin-1 β

Edited by Michael Kirchberger; peer-reviewed by Narendra Kumar, Patricia Brieve; submitted 31.Oct.2025; final revised version received 15.Apr.2026; accepted 07.May.2026; published 29.Jun.2026

Please cite as:

Wong TCM, Ong Y

Topical Recombinant Collagen Following Fractional Radio Frequency Microneedling for Nonsurgical Facelift: Case Report

JMIR Dermatol 2026;9:e86892

URL: <https://derma.jmir.org/2026/1/e86892>

doi: [10.2196/86892](https://doi.org/10.2196/86892)

© Thien-Chong Marcus Wong, Yizhi Ong. Originally published in JMIR Dermatology (<http://derma.jmir.org>), 29.Jun.2026. This is an open-access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work, first published in JMIR Dermatology, is properly cited. The complete bibliographic information, a link to the original publication on <http://derma.jmir.org>, as well as this copyright and license information must be included.