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Cosmetic

Laser Treatment Protocol for Bruise Management Using a Picosecond-Domain 1064-nm Nd:YAG Laser

Sangjun Park, MD*†
Jin-Hyun Kim, MD‡
Kyu-Ho Yi, MD, PhD‡§

Summary: Bruising after cosmetic procedures, such as botulinum toxin injections or dermal fillers, is a frequent complication. We present a new, detailed protocol using different types of lasers at various stages of bruise progression to optimize treatment effectiveness. This comprehensive protocol strategically integrates photoacoustic and photothermal effects, progressively adapting laser parameters to bruise maturation phases for maximal efficacy, thus offering a unified, efficient approach to managing postprocedural bruising. *(Plast Reconstr Surg Glob Open 2025;13:e7244; doi: 10.1097/GOX.0000000000007244; Published online 3 November 2025.)*

INTRODUCTION

A bruise, an extravasation of blood from blood vessels resulting in a nonelevated and irregularly shaped patch on the skin, is a common complication found after cosmetic procedures such as botulinum toxin injections and dermal fillers. The chance of occurrence varies across different patient populations but is known to be relatively high, with reported incidence ranging from 19% to 68%.[1]

Numerous methods to manage postprocedural bruises have been explored, including the use of vitamin K, *Arnica montana*, or bromelain. Preprocedural or periprocedural methodologies have also been explored, such as avoiding potential anticoagulants like aspirin and nonsteroidal anti-inflammatory drugs before the procedure, as well as using blunt-end cannulas.

Laser therapy has attracted growing interest for its well-documented efficacy in treating a broad range of pigmentary skin disorders. Despite numerous clinical reports describing individual laser modalities, clinicians still lack consensus-driven protocols that specify the most appropriate wavelength, pulse parameters, and indications. Consequently, device selection often reflects practitioner preference rather than standardized, evidence-based guidance.[2,3,4–6] We demonstrate a unified protocol that we use in our clinic for an efficient treatment of postprocedural bruises using lasers.

*From the *Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea; †Division of Pediatric Surgery, Department of Surgery, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea; ‡You and I Clinic, Seoul, Korea; and §Division in Anatomy and Developmental Biology, Department of Oral Biology, Human Identification Research Institute, BK21 FOUR Project, Yonsei University College of Dentistry, Seoul, Korea.*

Received for publication April 3, 2025; accepted September 10, 2025.

DOI: 10.1097/GOX.0000000000007244

PROTOCOL

Our protocol consists of multiple management steps that span several days. It presents a progressive approach to bruise management, adapting the laser parameters and its mechanisms of action according to the stage of bruise development. Although the timing of each treatment can vary between patients, we describe the average process that is taken. We also present 3 cases as proof of concept (Figs. 1, 2).

Day 1: Initial Phase Management

During the first 24 hours, extravasation of blood may continue, which potentially leads to bruise expansion. Thus, treatment focuses on vasoconstriction through cooling therapy to minimize bruise formation.

Days 1–2: Early Phase

Treatment during the early phase targets the disruption of blood clots through the application of low-intensity mechanical stimulation using laser-induced microvibrations. A 1064-nm picosecond (250 ps) Nd:YAG laser (Picocare Majesty, Wontech, Korea) is used with a fluence of 0.25 J/cm^2 and a 10-mm spot size. The laser is operated at a frequency of 10 Hz for approximately 10 minutes. We report a case in which immediate resolution of symptoms was observed within 15 minutes posttreatment.

Disclosure statements are at the end of this article, following the correspondence information.

Days 3–4: Intermediate Phase

In the intermediate phase, treatment continues to focus on clot disruption through laser-induced microvibrations. The same 1064-nm picosecond (250 ps) Nd:YAG laser (Picocare Majesty) is used, with an increased fluence of 0.35 J/cm² and a 10-mm spot size. Treatment duration and frequency remain consistent at 10 minutes and 10 Hz, respectively. Immediate posttreatment resolution was again observed in the presented case within 15 minutes.

Days 5–6: Late Phase

During the late phase, the objective remains the targeted mechanical disruption of residual thrombus. The 1064-nm picosecond (250 ps) Nd:YAG laser (Picocare Majesty) is applied with a further increased fluence of 0.45 J/cm², maintaining the 10-mm spot size and 10-Hz frequency for a 10-minute session. In the reported case, complete resolution was observed 15 minutes after the procedure.

DISCUSSION

In the contemporary field of plastic surgery, it is becoming increasingly important to consider the outcome and further prognosis of the treated patients. Not only is it important to assess such modalities before the actual treatment through various technologies,[7–9] but also dealing with posttreatment concerns through adequate follow-ups is significant in maximizing patient satisfaction and establishing rapport. Although this may seem like a good argument, it is for this reason that simply using a concealer does not work when dealing with posttreatment bruises. In practice, it is crucial to

Takeaways

Question: What is an efficient and effective way to manage bruising after cosmetic procedures?

Findings: We present a detailed, staged laser protocol using picosecond 1064-nm Nd:YAG lasers, strategically adapted to the phases of bruise maturation, significantly optimizing treatment outcomes.

Meaning: This unified laser protocol offers clinicians a reliable, stage-specific method for quickly and effectively managing postprocedural bruises.

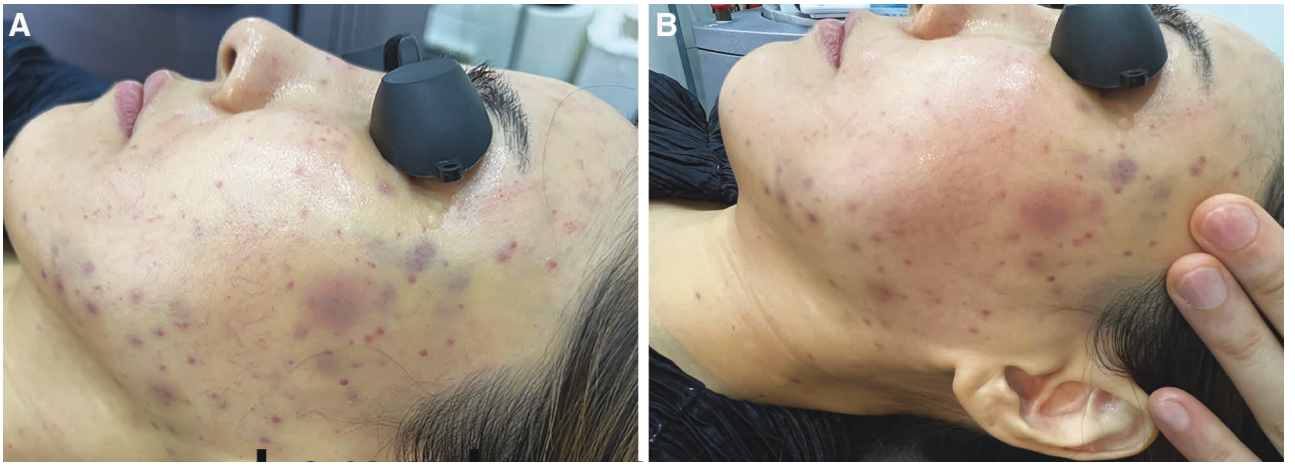

Fig. 1. Patient treated with picosecond laser. A, Numerous bruise occurrences after botulinum toxin and dermal filler injection. B, Bruise resolution 15 minutes after the application of a 1064-nm picosecond laser.

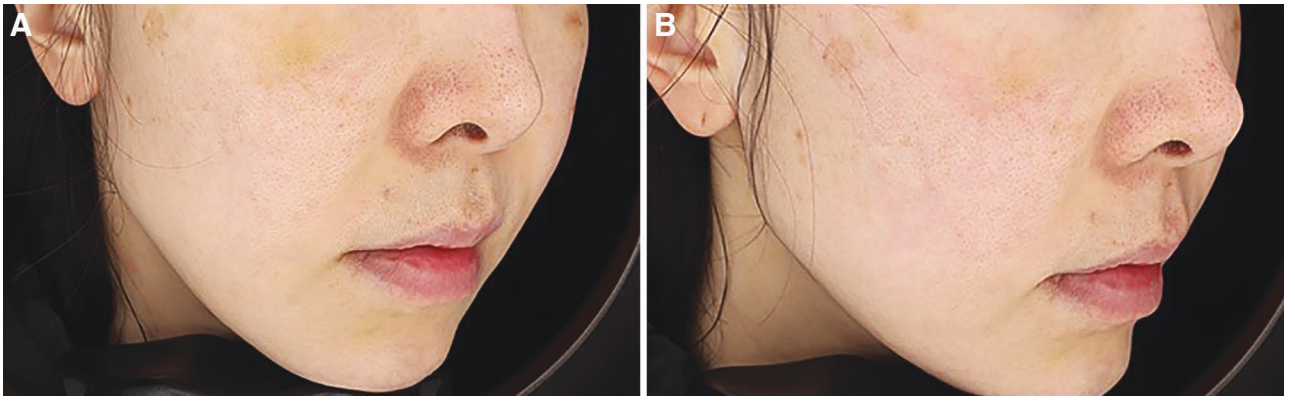

Fig. 2. Patient treated with picosecond laser. A, Bruise occurrence after dermal filler injection. B, Resolution of the bruise 15 minutes after the application of a 1064-nm picosecond laser.

understand and sympathize with the patient's concern, which is quite substantial when dealing with noticeable side effects such as these.

Compared with the photothermolysis effects of nanosecond lasers, picosecond lasers exert photoacoustic effects and thus focus on the actual destruction of the target lesions rather than creating any residual thermal damage to the nearby tissues. Picosecond lasers have been proven to be a safe and effective procedure in treating various dermatologic issues such as benign pigmentation, melasma, scars, and tattoos.[10] On this premise, we used picosecond lasers in the initial phase of the treatment before moving on to nanosecond and long-pulse lasers for maximizing treatment efficiency.

Our report has a few limitations. This study is a case-series study without a control group and thereby requires further studies, ideally randomized-controlled studies, to confirm its effectiveness. To scientifically validate this preliminary protocol, a future prospective, randomized-controlled trial is essential. Also, a mild to moderate amount of pain is induced while performing laser therapy, which can cause discomfort for some patients. This can be resolved with the use of ice packs or lidocaine cream on the area before treatment. Thorough explanation of the procedure and words of caution to the patient could be helpful in preserving rapport.

In conclusion, we have demonstrated a novel universal protocol for treating new bruises with picosecond lasers that commonly occur after cosmetic procedures. Our method combines all previously known knowledge regarding laser types and their parameters, and shows greater promise as a bruise management strategy.

Kyu-Ho Yi, MD, PhD
Division in Anatomy and Developmental Biology, Department of Oral Biology
Human Identification Research Institute, BK21 FOUR Project
Yonsei University College of Dentistry
50-1 Yonsei-ro, Seodaemun-gu
Seoul 03722, South Korea
E-mail: kyuho90@daum.net
Instagram: @kyuhoyi

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

PATIENT CONSENT

The patients provided written informed consent for the publication and use of their images.

DECLARATION OF HELSINKI

This study was conducted in compliance with the principles set forth in the Declaration of Helsinki.

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