

Case Report

Ablative Fractional Laser Resurfacing for Abdominal Scar Contractures in Pregnancy

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BACKGROUND: Fundal growth during pregnancy can lead to unremitting discomfort and skin breakdown in patients with extensive abdominal scarring.

CASE: A 31-year-old primigravid woman at 30 weeks of gestation presented to the department of dermatology with constant abdominal discomfort, itch, and sleep disturbance secondary to increasing tension associated with existing abdominal scars. An outpatient course of ablative fractional laser resurfacing was initiated in consultation with the dermatology department, resulting in immediate and durable symptom relief and visible abdominal expansion. No complications were observed, and the patient delivered a healthy newborn at term.

CONCLUSIONS: Ablative fractional laser resurfacing is a minimally invasive therapeutic alternative for treating pregnant patients with symptoms related to restrictive scarring of the abdomen.

(*Obstet Gynecol* 2015;125:924–6)

DOI: 10.1097/AOG.0000000000000527

Studies suggest that approximately 11 million people worldwide incur burn injuries requiring

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Financial Disclosure

The authors did not report any potential conflicts of interest.

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ISSN: 0029-7844/15

Teaching Points

1. Ablative fractional laser resurfacing is a promising adjunct to established therapies for scar contractures with cosmetic and functional impairment.
2. Early diagnosis and disposition of patients with problematic scars to a laser specialist can potentially improve satisfaction and outcomes.

medical treatment every year.¹ Clearly a significant number of female patients worldwide may be affected by abdominal scarring during pregnancy. Fortunately, severe pregnancy complications appear to be rare despite the presence of extensive abdominal scarring.² However, unremitting maternal discomfort, skin breakdown, uterine displacement, and restricted fundal growth are all potential complications. In cases requiring intervention, surgical scar release and split-thickness skin grafting is the current standard treatment in the setting of extensive abdominal contractures.^{3–5} Despite the relatively low rate of severe complications, the intractable nature of the symptoms before delivery calls for an effective and minimally invasive treatment option. Ablative fractional laser resurfacing is an emerging therapy to improve the appearance and function of disfiguring and disabling scars and scar contractures from a variety of etiologies such as acne, surgery, and various types of trauma.⁶ We report the successful use of outpatient ablative fractional laser resurfacing using topical anesthetic methods alone to mitigate the symptoms related to extensive abdominal scarring in late pregnancy.

CASE

A 31-year-old primigravid woman was referred to the department of dermatology at 30 weeks estimated gestational age to discuss postpartum laser treatment of abdominal scars in coordination with plastic surgery. She reported a history of second- and third-degree burns on the left arm, breasts, abdomen, lower back, and thighs from a scald injury incurred at 2 years of age, treated with a combination of multiple skin grafts and secondary intention healing. Although she noted intermittent itch and mild restriction with activity at baseline before pregnancy, with progressive abdominal expansion, the symptoms had become increasingly severe and unremitting and were interfering with sleep and daily activities. On presentation, the patient was in obvious discomfort, requiring assistance with sitting and standing. Examination revealed extensive circumferential scars and scar bands on the upper abdomen and flanks,



extending around to the lower back (Fig. 1A). The abdominal scars were notably thick and taut, with cords causing inferior and anterior fundal displacement. No erosions or ulcerations were noted.

Ablative fractional laser resurfacing has been integrated routinely into the multidisciplinary care of traumatic scars derived on and off the battlefield at our institution for approximately 5 years and offered a potential therapeutic option. In coordination with the obstetrics team, a treatment course was initiated with a microfractionated 10,600-nm carbon dioxide laser. The settings included a pulse energy of 35–50 mJ and a treatment density of 5%, corresponding to a treatment depth of approximately 1–2 mm (proportional to estimated scar thickness) and 95% of the cutaneous surface in the affected area remaining untreated (Fig. 1B). The procedure was performed in the outpatient clinic setting and anesthesia was provided with a forced-air cooling device alone. Posttreatment care included the application of petrolatum two to three times daily until healed, or approximately 2 days. The patient reported discomfort similar to receiving a tattoo followed by marked and immediate postprocedure relief of tension, increased mobility, and improved respiration (Fig. 1C and D). There were no significant complications; a brief course of a low-potency class VI steroid (desonide) controlled her mild-to-moderate pruritus.

The treatment was repeated at 38 weeks of gestation with similar results, although analgesia was supplemented with lidocaine 4% cream applied 1 hour before treatment to decrease the discomfort of the procedure. At 40 weeks

4 days of gestation, the patient underwent a cesarean delivery for nonprogressive labor, yielding a healthy 3,320-g male neonate. At follow-up 6 months after delivery she reported negligible tension and itch in the scarred areas. Overall comfort and functionality were improved compared with her prepregnancy baseline, and scar contour and pliability had improved on examination (Fig. 1E). Given these findings, she deferred surgical revision.

DISCUSSION

Ablative fractional laser resurfacing induces pixilated columns of thermal injury at tunable depths of penetration to initiate tissue remodeling; relatively large areas of untreated intervening skin remain between columns to help facilitate rapid healing. The avidity of absorption of ablative laser wavelengths (10,600 nm and 2,940 nm) by tissue water results in negligible heating outside the treatment field, which has positive implications for the theoretical safety of the procedure in pregnancy. It may seem counterintuitive to apply a controlled thermal injury to a scar to relax it. However, the efficacy of ablative fractional laser resurfacing for traumatic scars has been established in a growing number of reports.⁷ Although the immediate release in tension in this case likely was attributable to photomechanical fenestration of the restrictive scar sheet, improvements over the ensuing weeks and months appear to have

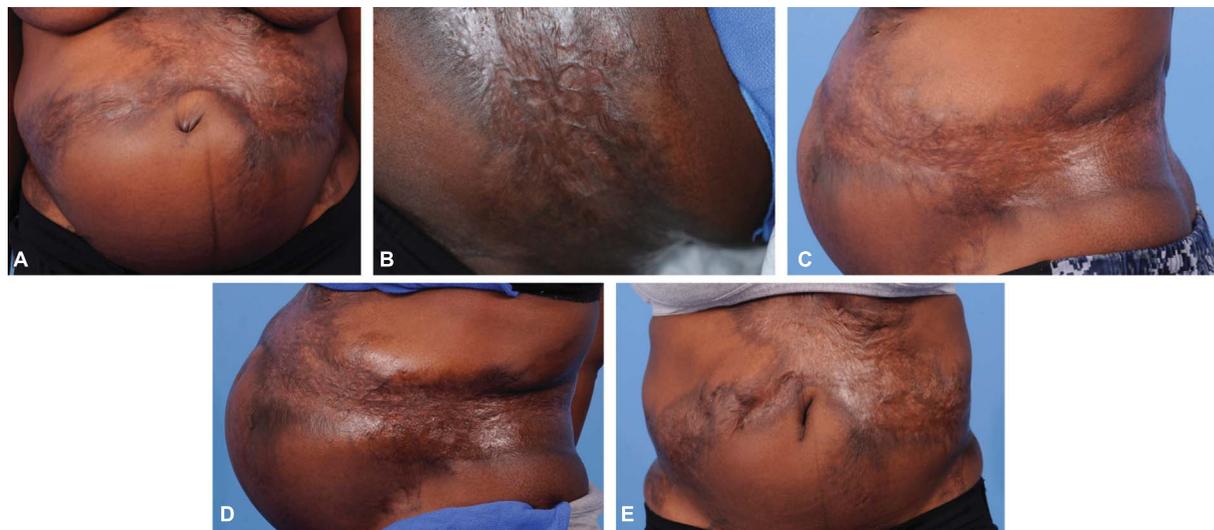


Fig. 1. A. Patient at presentation demonstrating symptomatic circumferential scar contractures of the upper abdomen. B. Patient during her initial fractional laser treatment. Ablative columns appear as tiny white crusts in a pixilated pattern. Bleeding is minimal after the procedure. Scant serous discharge appears several minutes after treatment and generally abates within 24 hours of the procedure. C. Patient at presentation 2 days before her initial laser treatment. D. Patient immediately after her initial fractional laser treatment demonstrating visible abdominal expansion corresponding to her subjective improvement in discomfort. E. Patient 6 months after delivery demonstrating enhanced scar contour, pigmentation, and pliability without evidence of treatment-related complications.

Cox. *Laser Scar Revision During Pregnancy*. *Obstet Gynecol* 2015.



resulted from gradual scar remodeling, with a relative normalization of the dermal architecture associated with robust remodeling.⁸

In conclusion, we report the successful application of ablative fractional laser resurfacing to mitigate symptoms associated with fundal expansion in the setting of preexisting abdominal scarring in pregnancy. We propose ablative fractional laser resurfacing as a promising adjunct to existing scar treatment paradigms guided by further research. Advantages of the modality include its tolerability, minimally invasive nature, and broad availability at dermatology and plastic surgery practices across the country.

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