

Feature: Complications from Laser Procedures Performed by Non-Physicians

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Results of a study that quantifies and analyzes the problems that can occur when non-physicians perform laser procedures.

The last few years have witnessed an unparalleled growth in device-based aesthetic medicine using lasers, light sources and radiofrequency devices. Often, products are brought to market with limited clinical data and limited long-term studies, which are valuable to have because these studies typically offer insight into potential complications.

In addition, we've seen rapid proliferation of non-physician use of these devices. Adding to the problem is the great state-by-state variability of device regulation. Also, the definition of "physician" supervision ranges from direct on-site supervision to facilities with medical directors who are physically located in other offices.

These factors are contributing to the increase in complications dermatologists are seeing. To get a better sense of the magnitude of this problem, colleagues and I conducted a study at my private practice laser center.

Study Background

The study, "Analysis of Complications from Lasers and Light Sources and Radiofrequency Devices by Non-Physicians," was presented at the American Society of Lasers in Medicine and Surgery annual meeting this year.

For this study, we reviewed 123 complications that resulted from treatment received from non-physicians. These patients presented as referrals over the course of 1 year. We reviewed the standard of care and corrective action that was given in my practice.

Three board-certified dermatologists with extensive expertise and advanced fellowship training in procedural dermatology (Drs. Tim Flynn, Ranella Hirsch and myself) analyzed the complications.

Analysis of the complications was based on the following criteria:

- types of complications
- cause of complication by indication
- complications by anatomic location
- nature of the device producing the complication
- nature of supervision of the non-physician provider.

Common Complications

Hyperpigmentation represented the most common complication, followed by hypopigmentation and hypertrophic scar formation. Of the complications reviewed, 42% were permanent, as defined by persistence of the complication for more than 1 year after the incident, with hypertrophic and atrophic scars as the most common complication.

Hair reduction was the most commonly treated condition that resulted in

complications (46%), followed by laser/light leg vein treatments (21%) and non-facial photorejuvenation (11%). Lower extremities were the most common location of complications (36%), followed by face (22%) and neck (12%). The most common cause of complications was the use of a device for an improper indication (35%), such as long-pulsed 1064 nm lasers for tattoo removal, pulsed light for melanocytic nevi and treatment of tanned skin with a variety of laser and light source devices.

Overutilization of a device for an indication (30%) for which an alternative therapy was superior represented the next most common cause of complications. Examples included the use of pulsed light for melasma and a long-pulsed 1064 nm laser for superficial lower extremity leg veins.

Devices involved in the highest number of complications were long-pulsed 1064 nm lasers and pulsed light without cooling. The least number of complications occurred with the flash-lamp pulsed-dye laser and Q-switched lasers.

Eighty two percent of all complications occurred in facilities that had no direct physician supervision. Of these, 57% were in facilities with a "medical director" who had limited training in dermatologic procedures and laser/light-based therapy. Of all the complications, 78% occurred in non-traditional medical facilities, such as free-standing medical spas and laser centers in shopping malls.

Suggested Solutions

This study represents one of the few systemic studies undertaken to analyze complications by non-physicians using lasers, light sources and radiofrequency devices.^{1,2} This study found that the greatest risk factors for complications are:

- inappropriate use of or overutilization of devices
- lack of direct supervision by physicians with training in dermatology
- inadequate cooling with devices.

Better training and education, better physician supervision, and standardization of the definition of physician supervision on a national level are necessary to help eliminate complications. In addition, better studies and long-term results of device usage will help reduce the overutilization and overpromotion of device-based aesthetic medicine.

Currently, a multi-center study is underway to analyze the short- and long-term complications by non-physicians in the practice of device-based medicine.

References:

1. Friedman PM, et al. "Nonphysician practice of dermatologic surgery: The Texas perspective." *Dermatologic Surgery*. 2004; 30:857-63.
2. Greve B, Raulin C. "Professional errors caused by lasers and intense pulsed light technology in dermatology and aesthetic medicine." *Dermatologic Surgery*. 2002;28:156-61.