

# Riehl Melanosis Treated Successfully With Q-Switch Nd:YAG Laser

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## ABSTRACT

Riehl melanosis is a rare cause of skin hyperpigmentation that typically occurs on the face and neck and is characterized by the rapid onset of gray-brown reticular pigmentation. It is theorized to be a pigmented contact dermatitis or a lichenoid immune reaction that may be caused by intrinsic as well as extrinsic factors. Treatment is challenging; laser and intense pulsed light (IPL) therapy is a common treatment for other pigmented skin conditions. IPL has been reported twice for the treatment of Riehl melanosis and we report a case of Riehl melanosis successfully treated with q-switched Nd:YAG after proving recalcitrant to IPL treatment.

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## INTRODUCTION

Riehl melanosis is a rare cause of skin hyperpigmentation that typically occurs on the face and neck and is characterized by the rapid onset of gray-brown reticular pigmentation. The condition was first described in 1917 by Riehl and was dubbed “war melanosis” as it became more prevalent in Vienna during the First World War.<sup>1</sup> In later reports, it has been theorized to be a pigmented contact dermatitis caused by fragrances, pigments, or bactericides found in common cosmetics.<sup>2</sup> More recently, it has been postulated that Riehl melanosis is a lichenoid immune reaction that may be caused by intrinsic as well as extrinsic factors.<sup>3</sup> The efficacy of reported treatments has been less than optimal. Reported therapies have included oral Vitamin C, topical bleaching products, and sun protection.<sup>5</sup> Intense pulsed light (IPL) therapy is a common treatment for other pigmented skin conditions and has been reported twice for the treatment of Riehl melanosis.<sup>6,7</sup> We report the a case of Riehl melanosis successfully treated with a q-switched (Qs) frequency-doubled (FD) Nd:YAG laser after proving recalcitrant to IPL.

## CASE REPORT

A 74-year-old woman presented to the clinic for evaluation for facial discoloration. She reported a 2-year history of brown discoloration on her cheeks that was progressing centripetally to her temples, forehead, eyelids, and chin. Prior to this eruption, she stated that she had only had a few freckles and on her face. She had used multiple over-the-counter lotions and tretinoin 0.05% cream with no improvement. She did not report a past or current use of cosmetics.

On examination, she had gray-brown macules and reticulated patches on her cheeks, forehead, temples, and chin as

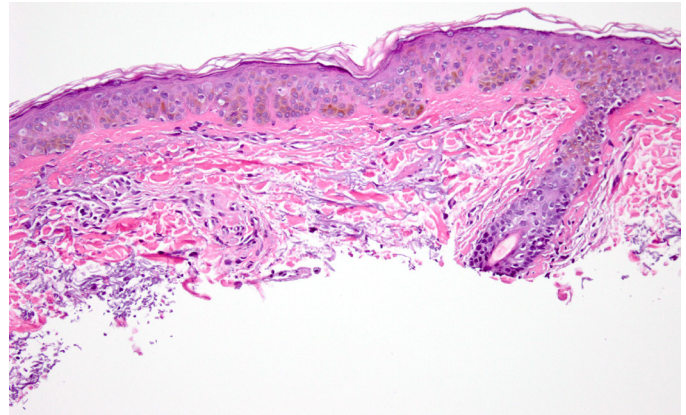
well as open comedones on her cheeks (Figure 1). A shave biopsy was performed from the left temple and pathology demonstrated lentiginous pigmentation along the basal layers of the epidermis with underlying solar elastosis and with a few melanophages (Figure 2). Given this information along with her clinical presentation, she was felt to have Riehl melanosis rather than solar lentigines or melasma.

At this time, given her failure with topical therapy, it was decided that laser therapy would be attempted. Anesthesia with lidocaine 4% cream (LMX4, Ferndale Pharmaceuticals) was performed prior to all treatments. All treatments (Table) were performed using an IPL platform (Harmony, Alma Lasers, Buffalo Grove, Illinois) with a variety of filters. A variety of filters and settings were utilized on limited areas of skin to determine effective setting for full-face treatment. Her first three treatments were disappointing either due to a lack of effect or adverse reaction so her fourth treatment was performed with Qs FD Nd:YAG handpiece. She noticed a mild reduction in pigmentation in the treated area. The Qs FD Nd:YAG handpiece was repeated one month later with an increase from 400mJ to 800mJ, with one pass performed on the left cheek and temple. She again reported a minimum of adverse effects and mild improvement so one month later the same filter and settings were used on a larger area of the left forehead, cheek, and chin. The patient failed to return for her fourth scheduled treatment. She returned to the clinic two months after her previous treatment. Upon her return, she reported she had skipped her previous appointment because the hyperpigmentation had suddenly and remarkably improved and she did not feel she needed another treatment. Interestingly, areas not treated with laser therapy had also improved significantly (Figure 3). A post-treatment biopsy was not performed.

**FIGURE 1.** Pre-treatment appearance with brown, gray macules and reticulated patches on her cheeks, forehead, temples and chin as well as open comedones on her cheeks.



**FIGURE 2.** Biopsy from the left temple, which demonstrates lentiginous pigmentation along the basal layers of the epidermis, solar elastosis and melanophages in the papillary dermis.



**FIGURE 3.** Appearance two months after her last treatment, showing improvement of the discoloration of all areas of her face, including areas not directly treated.



## DISCUSSION

Riehl melanosis is a condition of skin pigmentation characterized by the sudden onset of gray-brown reticular pigmentation. It has been attributed to a lichenoid reaction or allergic contact dermatitis due to cosmetics or other allergens.<sup>1-4</sup> Reported therapies are few and rarely successful. IPL therapy for this condition has been reported twice.<sup>6,7</sup> This is the first report of the successful treatment using a Qs FD Nd:YAG handpiece following recalcitrance to IPL treatment. The theory of selective photothermolysis and patient response guided the treatment of this patient. The Q-switching mechanism of the device results in ultra-short, nanosecond bursts of energy, which is preferentially absorbed by melanin within the melanophages.<sup>8</sup>

The pathogenesis of Riehl melanosis is unknown. It has been proposed that repeated episodes of subclinical inflammation, from any number of etiologies, may result in the clinical and histologic findings.<sup>3,4</sup> The dominant histological features are basal liquefaction degeneration and papillary dermal melanophages.<sup>4</sup> The successful treatment of Riehl melano-

**TABLE 1.****Summary of the Treatments Performed Prior to Sudden and Widespread Improvement**

Treatment	Handpiece/ Settings	Treatment Site	Immediate Skin Response	Outcome
1	Er:YAG (2940nm)/ 1400mJ, 0.5ms, 1cm <sup>2</sup> , 8 passes	Left lateral face	Ashy, tan patches	No Change
2	570nm/ 16J, 10ms, 3cm <sup>2</sup> , 2 passes	Right lateral face	Erythema	No Change
3	570nm/ 18J, 10ms, 3cm <sup>2</sup> , 2 passes	Right lateral face	Erythema	Erythema, edema, scabbing, and scarring; minimal improvement
4	QS FD Nd:YAG (532nm)/ 400mJ, 20ns, 2mm <sup>2</sup> , 1 pass	Left temple	White ashy patches with punctuate bleeding	5 days of erythema; minimal improvement
5	QS FD Nd:YAG (532nm)/ 800mJ, 20ns, 2mm <sup>2</sup> , 1 pass	Left temple and cheek	White ashy patches with punctuate bleeding	5 days of erythema; minimal improvement
6	QS FD Nd:YAG (532nm)/ 800mJ, 20ns, 2mm <sup>2</sup> , 1 pass	Left temple, cheek, and chin	White ashy patches with punctuate bleeding	5 days of erythema; rapid, global improvement

Er:YAG: erbium:yttrium, aluminum, garnet, J: joules, mJ: millijoule, ms: millisecond, nm: nanometer, ns: nanosecond, QS FD Nd:YAG: q-switched frequency-doubled neodymium:yttrium, aluminum, garnet

sis with Qs FD Nd:YAG laser has not been documented. In a previous report, IPL using filters of 590, 640, and 694 had been used successfully to treat Riehl melanosis.<sup>6,7</sup> However, when a similar filter of 570nm was used for this patient she had no response using a setting of 16 joules and a severe response with blistering at 18 joules. Thankfully, a change to the Nd:YAG filter resulted in cosmetically acceptable improvement without adverse effects. Despite only treating a minority portion of her affected skin, the patient reported reduced pigmentation of all areas. It is possible that the laser therapy treated incited an immune response that resulted in improvement in her pigmentation or alternately treated a subclinical inflammatory process.

This case reports the successful treatment of Riehl melanosis with a Qs FD Nd:YAG following failure of IPL therapy. This modality should be considered for the treatment of this unusual pigmented dermatosis.

## DISCLOSURES

The authors have no relevant conflicts to disclose.

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