

# Complete regression of a melanocytic nevus after epilation with diode laser therapy

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**ABSTRACT** The use of lasers and intense pulsed light (IPL) technology has become an established practice in dermatology and aesthetic medicine. The use of laser therapy and IPL in the treatment of pigmented melanocytic lesions is a controversial issue. We report clinical, dermoscopic and histological changes of a completely regressed pigmented melanocytic nevus after hair removal treatment with the LightSheer™ Diode Laser (Lumenis Ltd, Yokneam, Israel).

## Introduction

The use of lasers and intense pulsed light (IPL) technology has become an established practice in dermatology and aesthetic medicine. The number of treatments performed with lasers and IPL has increased remarkably in the last two decades. An 810 nm, high-power diode laser system (LightSheer™ Diode Laser [Lumenis Ltd, Yokneam, Israel]) is among one of the newer lasers now available for hair removal [1,2]. We report clinical, dermoscopic and histological features of a complete regressed pigmented melanocytic nevus after hair removal treatment with LightSheer Diode Laser.

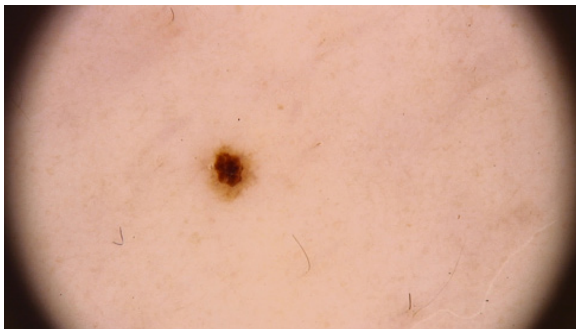
## Case report

A 30-year-old woman with multiple acquired melanocytic nevi and Fitzpatrick skin type III, presented for digital dermoscopy.

She had a family history of malignant melanoma (in her father) and reported recent changes in a pigmented mole of unknown duration in her right calf. Upon examination, this pigmented lesion measured 5 mm in diameter, was dark brown in color (Figure 1) and displayed a homogeneous disorganized



**Figure 1.** Melanocytic lesion in the right calf, measured 5 mm and dark-brownish in color. [Copyright: ©2015 Boleira et al.]



**Figure 2.** Homogeneous disorganized pattern on dermoscopy. [Copyright: ©2015 Boleira et al.]

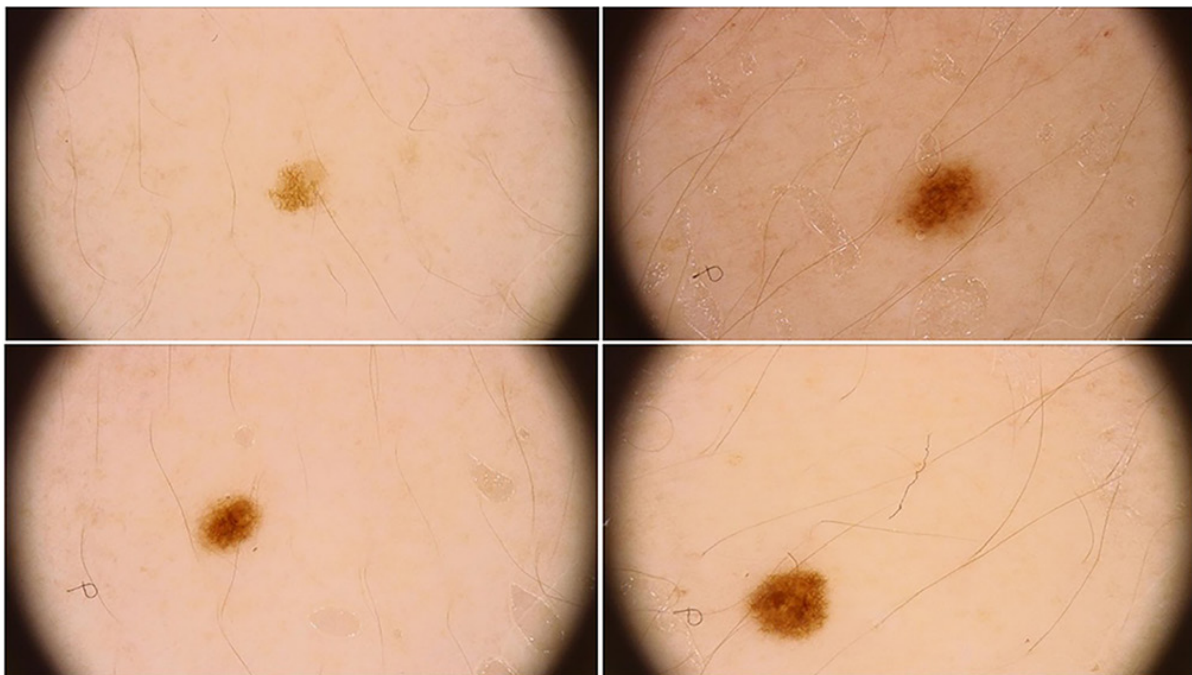
pattern on dermoscopy (Figure 2), differing from the other nevi located on the abdomen and back region which exhibited a predominantly reticular pattern (Figure 3). There were no clinical signs of inflammation. This lesion was considered suspicious and an excisional biopsy was performed to rule out melanoma. Histologically, there was scale-crust permeated by melanin situated above a basket-weave stratum corneum and, at the center of the lesion, there was a geometric triangular area of basophilic collagen degeneration with the vertex pointed downwards in the papillary dermis characteristic of laser injury and numerous associated melanophages. There was no evidence of a residual melanocytic neoplasm in the sections of tissue examined. Immunohistochemical stains using anti-S100 protein, anti-Melan-A and anti-HMB45 primary antibodies were unable to show scattered residual neoplastic melanocytes. The diagnosis of a regressed pigmented lesion,

presumably a melanocytic nevus, secondary to previous laser therapy was rendered (Figure 4). The histopathologic diagnosis prompted an active inquiry for previous laser therapies, and it was discovered that the patient had undergone cosmetic removal of leg hair with an 810 nm, pulsed, high-power diode laser (LightSheer Diode Laser) 15 days prior to the biopsy.

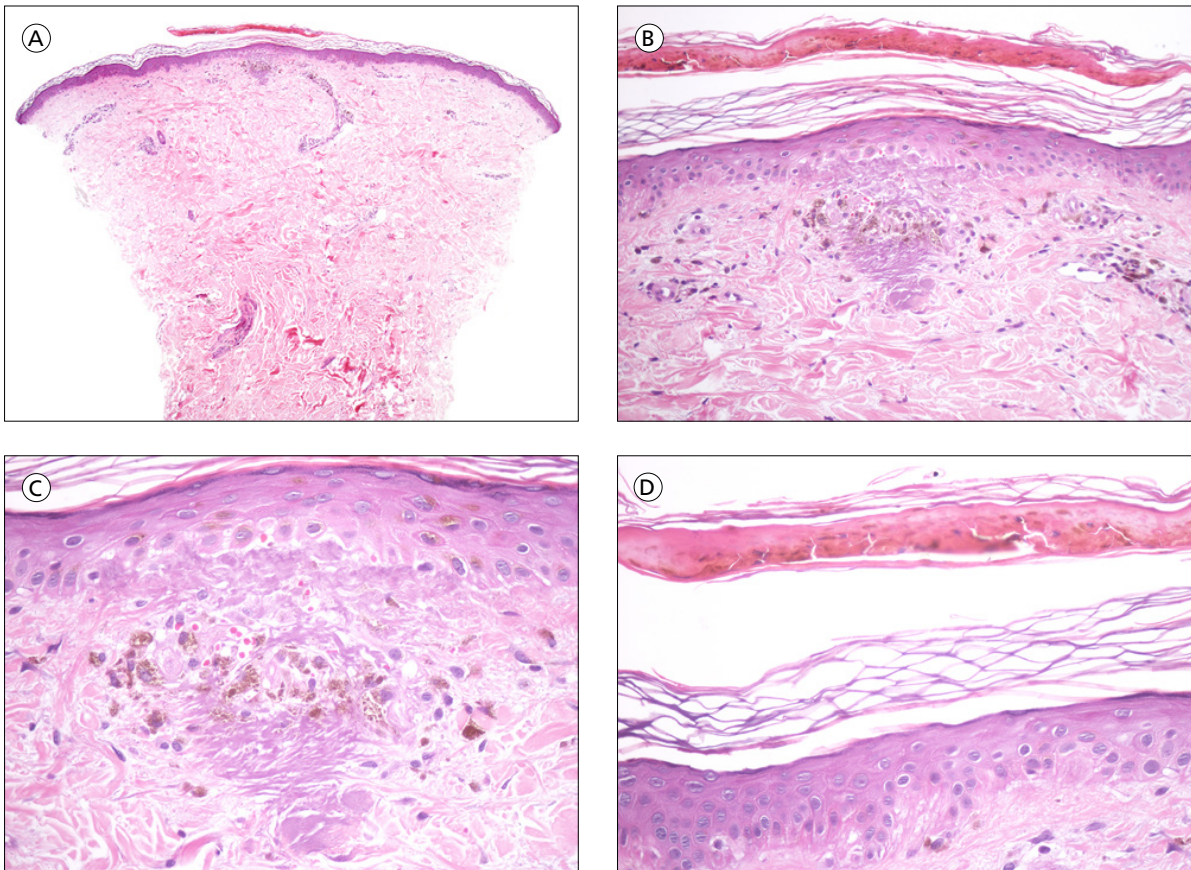
## Discussion

The majority of lasers used for hair removal target melanin as the chromophore, consequently there are limitations and potential side effects mostly pertaining to alterations in pigmentation. In healthy skin, the higher density of melanin within the hair shaft and within the follicular matrix cells as well as the presence the larger and more heavily melanized melanosomes relative to the epidermis contributes to the preferential targeting of melanin in the hair follicle over melanin in the epidermis. In a nevus, the increased number of melanocytes and melanin suggests that the photons of the laser for hair removal might be absorbed by the neoplastic melanocytes and pigmented keratinocytes, resulting in aforementioned clinical, dermoscopic and histological changes.

In patients with multiple Clark's nevi or with a personal or family history of melanoma, a mole undergoing changes in clinical or dermoscopic features during a period of follow-up or with a distinct morphology in comparison to the other nevi are concerning findings [3]. These changes or atypical findings often warrant that a biopsy be performed to rule out malignancy [3-6].



**Figure 3.** Digital dermoscopy of others nevi located on the abdomen and back region showed a diffuse regular reticular pattern with a delicate pigment network, ranging from light to dark brown in color. [Copyright: ©2015 Boleira et al.]



**Figure 4.** (A) Scale-crust and melanin granules over a reticular stratum corneum. Papillary dermis showed basophilic degeneration of collagen. H&E, x10. (B) Papillary dermis showed basophilic degeneration of collagen in a triangular shape with the apex pointing downward and melanophages. H&E, x40. (C) Basophilic degeneration of collagen in a triangular shape with the apex pointing downward and peripheral melanophages. H&E, x100. (D) A close-up to the scale-crust permeated by melanin. H&E, 100x. [Copyright: ©2015 Boleira et al.]

The patient herein presented experienced complete histological involution presumably of a melanocytic nevus after diode laser therapy. Since the lesion was biopsied just 15 days after epilation, it was possible to identify the characteristic geometrical collagen degeneration that prompted the recognition of laser damage, as well the presence of crust permeated by melanin atop the corneum layer [7,8,9]. If the lesion were biopsied substantially later, it would have displayed superficial dermal fibrosis in conjunction with melanophages, similar to previous case reports of completely regressed melanocytic nevi after laser therapy [1,10,11,12].

In some instances, melanocytic nevi have persisted after laser injury. In such cases, the residual neoplasm displayed dermoscopic and histopathological changes similar to those seen in recurrent nevi (so called pseudomelanomas) occurring in surgical scars. With dermoscopy, these lesions may exhibit irregular network, streaks, globules of variable sizes and colors and dark brown blotches over a white scar area. Histopathologically, recurrent/persistent nevi may present variably atypical melanocytes irregularly disposed along the

dermoepidermal junction and in pagetoid distribution within the epidermis, simulating malignant melanomas. However, the distinction is possible because in the former these findings are restricted to the area above the dermal fibrosis, while in the latter they often extend beyond it [13-16]. In cases where an unequivocal distinction between recurrent nevus and melanoma cannot be achieved, review of the previous biopsy (when available) usually resolves the quandary.

There are also cases in which a diagnosis of melanoma has been made subsequent to laser treatment of a melanocytic lesion. We believe some of these lesions were actually melanomas from the outset and, therefore, inadequately treated with lasers, while others could have been nevi that displayed changes of recurrent nevus (pseudomelanoma) after laser therapy that were ultimately misconstrued as transformation of a nevus in melanoma [1,5].

An electronic search on the PubMed database yielded a small number of publications regarding changes in melanocytic nevi after hair removal treatment with laser or IPL. This is summarized in Table 1, which includes two cases that

**TABLE 1. Reports of melanocytic nevi that changed after hair removal treatment with laser or intense pulsed light.**

First author	Clinical evaluation	Laser type	Outcome
Soden, 2001 [3]	Four melanocytic nevi	Diode laser	Clinical changes
Martin, 2012 [1]	One melanocytic nevus	Intense pulsed light	Complete regression, histologically confirmed
Sillard, 2013 [4]	Two melanocytic nevi	Intense pulsed light	Dermoscopic changes
Garrido-Ríos, 2013 [5]	Patient 1—Two melanocytic nevi	Diode laser	Dermoscopic and histopathological changes
	Patient 2—Two melanocytic nevi	Alexandrite laser	Dermoscopic and histopathological changes
	Patient 3—several melanocytic nevi (no specific number)	Intense pulsed light	Clinical and dermoscopic changes
Piccolo 2012 [11]	Patient 1—melanocytic nevus	Intense Pulsed Light	Complete regression, histologically confirmed
	Patient 2—congenital nevus		Dermoscopic changes; No significant changes histologically

showed complete histological regression of a melanocytic nevus under intense pulsed light therapy for axillary hair removal [1,4,5,6,12].

## Conclusion

Hair removal with lasers in areas containing melanocytic nevi may result in incidental treatment of nevi and subsequent changes in clinical and dermoscopic features, which, in turn, may raise suspicion for melanoma, especially in patients with multiple risk factors. Dermatologists should be aware of this phenomenon and be careful to avoid melanocytic nevi while treating an anatomic area with laser for epilation. Despite many publications reporting treatment of melanocytic nevi with lasers, it remains a controversial issue. In our opinion, laser therapy should not be considered a routine indication for melanocytic lesions that have not been biopsied and histopathologically evaluated and in the event of incomplete treatment may induce changes that could simulate malignant melanoma. When presented with a melanocytic nevus that has undergone recent change in an area previously treated with laser epilation, dermatologists should be mindful that it might represent a “recurrent nevus” rather than a melanoma. Moreover, it is essential that the pathologist interpreting the biopsy be provided with as much clinical information as possible, minimizing the possibility of erroneously rendering a diagnosis of melanoma and consequently unnecessary surgical procedures, adjuvant treatment and follow-up regimens.

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