Therapeutic report

LENTIGINOSIS IN QUADRANT DISTRIBUTION. SUCCESSFUL TREATMENT WITH ARGON LASER

D. Kopera and H. P. Soyer

SUMMARY

A 34-year-old woman with numerous lentigines in a quadrant distribution scattered over the lower right portion of her body is presented. Removal of multiple lentigines may be crucial. A safe and effective method for the removal of multiple lentigines is shown. Differential diagnoses of this unusual distribution pattern of lentigines are discussed. Argon laser treatment has been initiated for the management of this pigmentary disorder for cosmetic reasons. Lentigines faded within 4 weeks after application of 2 to 4 argon laser light impulses each.

Quadrant distribution of skin lesions represents a rare pattern due to mosaicism in early embryogenesis. Treatment of lentigines with argon laser can be regarded as an effective approach in the management of multiple lentigines leading to an excellent cosmetical result.

KEY WORDS

lentiginosis, treatment, argon laser

INTRODUCTION

Simple lentigines are clinically characterized as small, rather sharply circumscribed brownish-black macules on otherwise regular skin. They are generally regarded as precursors of junctional melanocytic nevi (1,2). Usually simple lentigines appear scattered over trunk and extremities of younger individuals with increased susceptibility to sunburn. Besides this classical pattern, numerous simple lentigines may rarely occur in peculiar distributions, namely generalized (e.g. leopard syndrome), grouped (agminated), or segmental (zosteriform) (Tab. 1) (3-8). These unusual variants of lentigines, commonly called lentiginosis, should be clearly distinguished from lentiginous lesions arising on the diffuse brownish background of a preexisting nevus (e.g. speckled nevus) (9).

We report on a female presenting multiple simple lentigines and four melanocytic nevi scattered over the lower right quadrant of her body with special emphasis on the treatment modalities.

PATIENT AND METHODS

Report of a case.

A 34-year-old woman presented with numerous lentigines in unusual distribution. At the age of 5, "freckles" on her right leg and the lower right portion of the trunk were first noticed by her mother. At the same time larger whitish patches occurred on the neck, right hip and bust. Familial history revealed no pigmentary anomalies within the last three generations. Clinically numerous brownish-black macules up to 2 mm in diameter were scattered over the lower right quadrant of her skin. The "spotted" skin was rather sharply demarcated against the rest of the body: from the pubic area to the navel, and like a belt around the body to the spine, ending in the crena ani (Fig. 1). In addition to the numerous lentigines four slightly elevated brown lesions with a diameter of 5 mm were situated on the right thigh and on the right suprapubic area. Only very few lentigines were present on the other body regions. Besides these pigmented lesions, some depigmented patches of 4 cm in diameter were present on the neck, on the right hip and on the chest.

Histopathology

Punch biopsies of three small lentigines and one white patch were obtained, all four larger pigmented lesions were excised totally.

All three lentigines were histopathologically similar and were characterized by a moderately dense melanin pigmentation of the basal cell layer. A slightly increased number of typically appearing melanocytes was present in the basal layer of sections from all three specimens. Also in serial sections nests of melanocytes could not be observed. No giant melanosomes were present. Based on these histopathologic

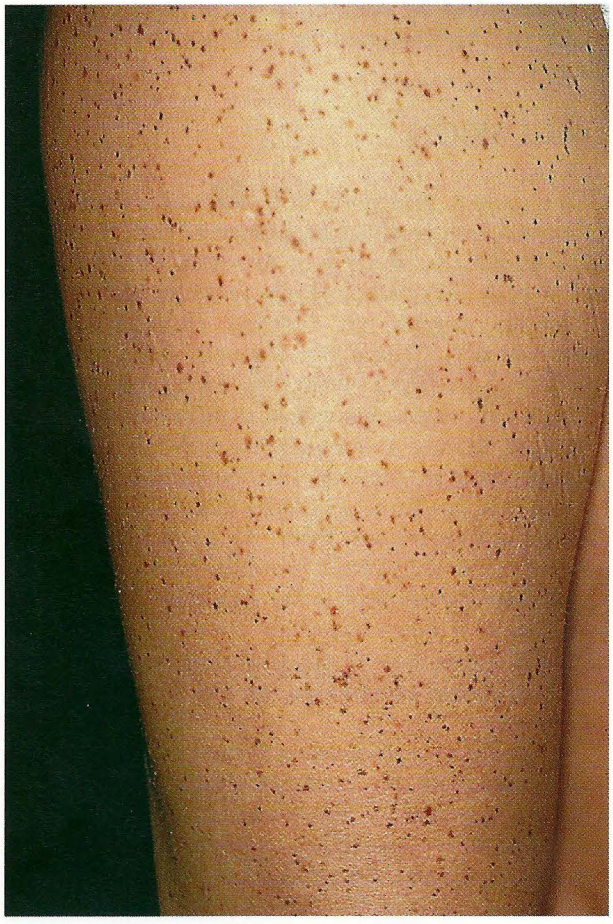

Figure 1. Lentiginosis in quadrant distribution: Small, non-elevated brownish-black macules up to 2 mm in diameter scattered over the right thigh.

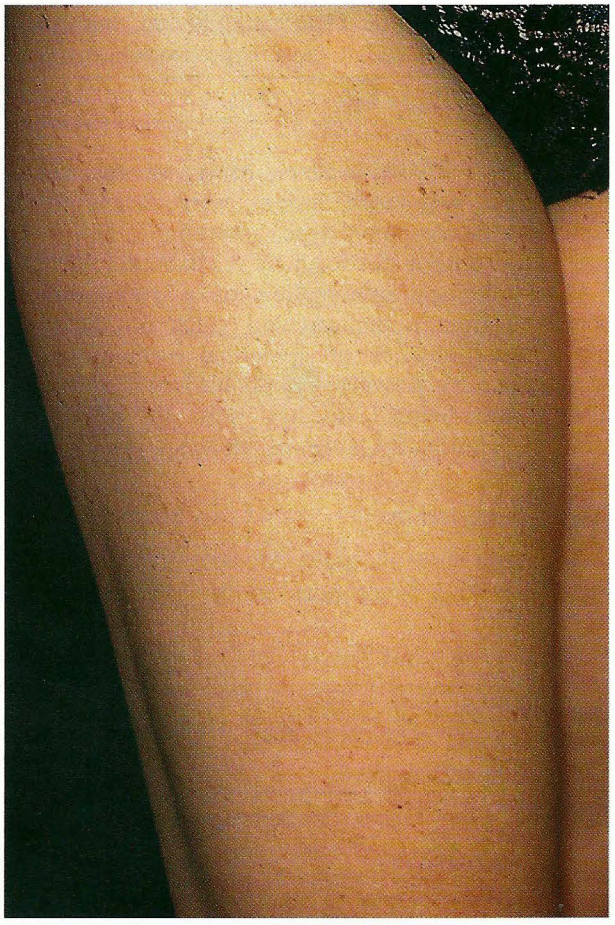

Figure 2.
Four months after argon laser treatment of lentiginosis.

Table 1. Disorders characterized by numerous lentigines

Disorders characterized by numerous lentigines
Carney syndrome
Centrofacial lentiginosis (Touraine, Greither)
Generalized lentigo
Lentiginous mosaicism
Lentiginosis perigenito-axillaris
Lentiginosis profusa syndrome (leopard)
Lentiginosis with hemangiomas (Bandler)
Lentiginosis with nystagmus and strabismus (Pimkin)
Multiple lentigines syndrome
Partial unilateral lentiginosis
Periorificial lentiginosis (Peutz-Jeghers)
Pigmented unilateral nevus-like lentigo
Syndrome of peptic ulcer/hiatal hernia, multiple lentigines, café-au-lait spots, hypertelorism, myopia
Tay's syndrome

features the diagnosis of simple lentigo was established. The larger pigmented lesions were diagnosed as Clark's nevi, compound type, according to the histopathologic criteria set forth by A. B. Ackerman (1).

Histopathologic examination of a punch biopsy specimen from a depigmented patch on the right hip showed absence of epidermal melanin and a very sparse perivascular lymphohistiocytic infiltrate. The histopathologic findings were in accordance with the clinical diagnosis of vitiligo.

Argon laser treatment.

An argon laser [Cooper Medical Model 25] has been used in a single pulse mode. Spot size was 1 mm and pulse duration 0.5 sec, at a power level of 1.5W. In 10 sessions all lentigines were exposed to 2 to 4 overlapping argon laser light impulses each. Anesthesia was not required.

Immediately after argon laser exposure a 4 mm biopsy specimen showed partial epidermal necrosis and a moderately dense mixed cell infiltrate in the upper dermis.

Table 2. Lentiginous lesions within a preexisting nevus

Lentiginous lesions within a preexisting nevus
Mosaic speckled nevus
Naevus spilus tardus (Becker´s nevus)
Speckled nevus
Speckled lentiginous nevus
Speckled zosteriform lentiginous nevus
Zosteriform lentiginous nevus

RESULTS

Clinical outcome after argon laser treatment

Four months after the final laser treatment the formerly "freckled" lower right quadrant of the patient's skin exhibited almost the same homogenous complexion as the surrounding normal skin (Fig. 2). A now obtained biopsy specimen revealed only slight fibrosis of the papillary dermis and a normal melanocyte number without increased melanin pigmentation of the basal layer. Recurrent pigmentation could not be observed in a follow-up period of three years.

DISCUSSION

Our patient presented with a peculiar variant of systemized lentigines, namely numerous small brownish-black macules scattered over the distal right quadrant of her body histopathologically revealing the features of lentigo simplex. In addition, four melanocytic compound nevi, Clark´s type (formerly called dysplastic nevi), were observed within this area supporting the concept that simple lentigines actually may represent precursor lesions of melanocytic nevi (10).

Lentiginosis in regional distribution on otherwise normal skin has been previously described attributing various denominations (Tab. 1) (3-8). Lentiginous lesions within the diffuse brownish background of a pre-existing nevus have to be carefully distinguished as differential diagnoses (Tab. 2) (9). In our view, the term "lentiginosis in quadrant distribution" reflects best the clinical description of the findings in our patient.

The peculiar distribution of the lentigines found in this patient is quite comparable to the pattern in a patient reported by Sterry and Christophers. Their patient, however, presented multiple dysplastic nevi (Clark's nevi) and two malignant melanomas in a quadrant distribution (11). The quadrant manifestation of the skin lesions in the patient presented here may be explained by somatic mutation early in ontogeny causing mosaicism (12). In the management

of multiple lentigines thorough investigation has to exclude the presence of associated symptoms, such as cardiac myxomas, gastrointestinal neoplasms and organ dysplasias as found in Carney syndrome, leopard syndrome, or periorificial lentiginosis (Tab. 1).

The treatment of multiple lentigines may be difficult, because surgical excision or punching is not suitable for a large number of lesions, as scars have to be expected. Chemical peeling represents a technique able to remove superficial epidermal pigmentation, but does not affect pigments of the basal cell layer and of the papillary dermis. The application of liquid nitrogen promises the achievement of good cosmetical results and can be seen as an alternative type of treatment.

In our patient we chose the argon laser for the removal of multiple lentigines utilizing the advantages of the selective absorption spectrum of melanin representing the major absorber of light (wavelengths: 320 nm-1000 nm) in the epidermis. Thus, different types of high energy laser systems have been employed for the photothermic destruction of skin pigmentation. Blue-green argon laser light (main output at wavelengths 488 nm and 514 nm) is highly absorbed by melanin and hemoglobin and is able to destroy these pigments selectively. Thermal injury of non-cromophoric connective tissue is minimal. Subsequent healing without major clinical evidence of scarring is the rule (13). New pigmentation appearing several years after argon laser therapy of pigmented lesions has been reported reinforcing the necessity for careful long time follow-up (14). Due to the specific absorption of argon laser light by melanin, this source has been used instead of the rather unspecific thermal destruction achieved by the carbon dioxide laser, emitting invisible infrared light (wavelength 10600 nm) mainly absorbed by water (15). In melanocytic lesions recurrence has also been reported following carbon dioxide laser treatment. Histopathological classification of recurrent nevi may be difficult and reveal pseudomelanoma. The q-switched ruby laser (wavelength 694 nm) produces a high peak power output with a pulse duration in the nanosecond range and is able to provide selective melanosomal damage without affecting surrounding tissue structures. Clearing of pigmented lesions has been reported following experimental ruby laser application (16, 17).

In our patient, argon laser treatment led to a highly satisfying result in esthetic terms (Fig. 2). Recurrent pigmentation could not be observed in a follow-up period of three years.

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AUTHORS' ADDRESSES

Daisy Kopera MD, Department of Dermatology, University of Graz, Auenbruggerplatz 8, A- 8036 Graz, Austria

Hans Peter Soyer MD, professor of dermatology, same address