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CASE REPORT

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Correlation between reflectance confocal microscopy and high-magnification dermoscopy findings in lentigo maligna of the external ear

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ABSTRACT

The differential diagnosis of pigmented macules developing in the head and neck area may be challenging. Non-invasive imaging methods, including dermoscopy, reflectance confocal microscopy (RCM) and super-high magnification dermoscopy, enable more accurate assessment and increase diagnostic sensitivity and specificity. The present study reports a patient with lentigo maligna (LM) in an uncommon location of the external ear and presents dermoscopic and RCM features. The authors would like to highlight the close correlation between findings in super-high magnification dermoscopy and RCM. Additionally, in agreement with international experts, the diagnosis of a junctional nevus developing on chronically sun-exposed skin of the head and neck area is questioned.

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Keywords: lentigo maligna, lentigo maligna melanoma, melanoma *in situ*, reflectance confocal microscopy, dermoscopy

CASE REPORT

A 65-year-old female patient was referred to the Department of Dermatology for evaluation of a pigmented lesion on the right auricle. The macule had appeared approximately 2 years earlier and was rapidly enlarging. Personal and family history for melanoma was negative. However, the patient reported chronic sun exposure in the past. Six months earlier, an incisional biopsy was taken from the lesion in the ear, nose, and throat (ENT) department. The histopathological result at that time was consistent with a melanocytic junctional nevus.

On physical examination, a brownish-black macule approximately 2 cm in diameter with irregular margins and pigment distribution was observed on the superior crus of the right antihelix. Dermoscopic examination showed two suspicious areas with irregular, atypical pigmented pseudonetwork, angulated lines, follicular obliteration and grey circles (Fig. 1). An examination with reflectance confocal microscopy (RCM) showed numerous round large cells and dendritic cells in the epidermis (pagetoid infiltration) with features of folliculotropism. Incisional biopsies were taken from these two areas. Despite evident features in dermoscopy and RCM indicating a malignant lesion, histopathological examination once again was consistent with the diagnosis of junctional nevus. The patient attended a follow-up visit after 3 months. At this time, dermoscopy revealed the presence of an area with grey dots and globules (annular-granular pattern) in the central part of the lesion (Fig. 2) and RCM showed pagetoid dendritic cells surrounding hair follicles (folliculotropism) and clusters of atypical melanocytes and single roundish melanocytes in the epidermis (Fig. 3, 4). Because of the strong suspicion of melanoma, another incisional biopsy was taken from this site. This time, histopathological examination was consistent with the diagnosis of lentigo maligna (melanoma *in situ*).

DISCUSSION

Lentigo maligna (LM) is the most common form of melanoma in situ, accounting for 79 to 83% of all cases. It develops mainly in the elderly, almost exclusively in Caucasians,

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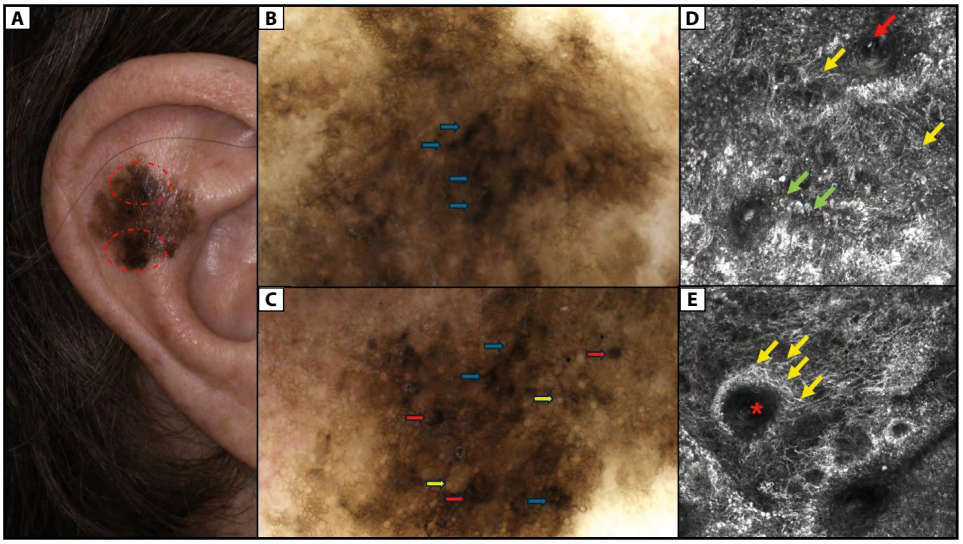

Figure 1. Initial presentation: (**A**) clinical image showing an irregularly pigmented macule on the right external ear. The locations of incisional biopsies are marked with red circles; (**B**) and (**C**) corresponding dermoscopic images of sites selected for biopsies; (**D**) and (**E**) corresponding reflectance confocal microscopic (RCM) images of sites selected for biopsies; (**B**) in the upper portion of the lesion angulated lines (*blue arrows*) were observed under dermoscopy; (**C**) in the bottom part of the lesion angulated lines (*blue arrows*), follicular obliteration/brown blotches (*red arrows*) and grey circles (*yellow arrows*) were present under dermoscopy; (**D**) RCM of the upper portion of the lesions showed epidermal disarray, pagetoid infiltration with dendritic cells (*yellow arrows*) and multiple round nucleated cells (*green arrows*), and follicle invasion (*red arrow*); (**E**) RCM of the bottom part of the lesion showed multiple dendritic cells (*yellow arrows*) surrounding hair follicles (*red asterisk*)

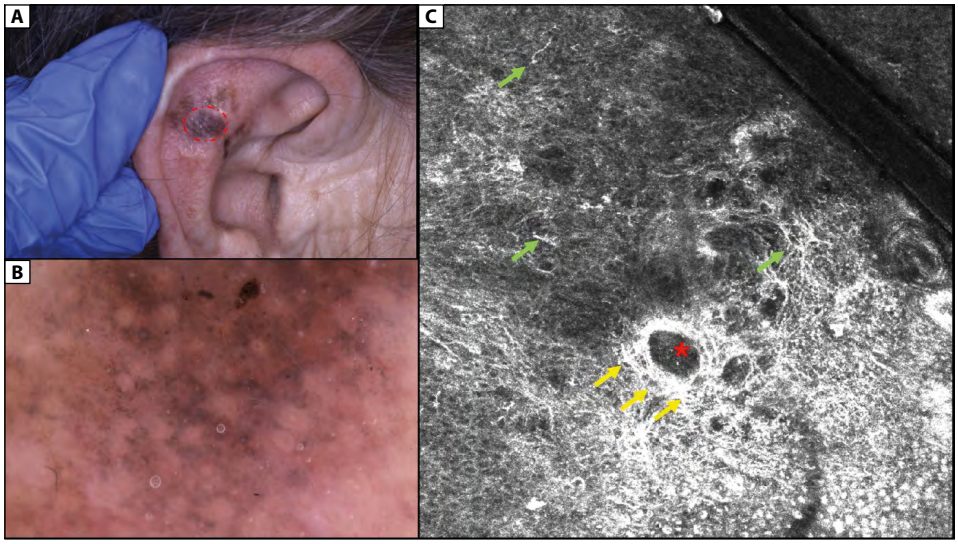

Figure 2. Follow-up visit after three months: (**A**) clinical image showing an irregularly pigmented brown-grey macule on the right external ear, with linear white scars after prior biopsies. The location of third incisional biopsy is marked with red circle; (**B**) dermoscopic image of the site selected for biopsy — dominant annular-granular pattern is present; (**C**) reflectance confocal microscopic (RCM) image of the site selected for biopsy — pagetoid dendritic cells in the spinous layer (*green arrows*) and multiple dendritic cells (*yellow arrows*) surrounding hair follicles (*red asterisk*) — folliculotropism

and the peak incidence is between 65 and 80 years of age, with a slight predominance among women [1–3]. The incidence has been increasing significantly in recent years [2]. Lentigo maligna most commonly develops in fair-coloured skin chronically exposed to ultraviolet radiation (UR) and with a history of sunburn [2, 3]. It mainly involves locations such as the head and neck [1]. Chronic exposure to UR has a cumulative effect [4] and therefore LM is more prevalent in patients living their entire lives in regions with high levels of UR [1, 4]. In addition, LM is significantly more common in hereditary diseases such as *porphyria cutanea tarda*, *oculocutaneous albinism*, *xeroderma pigmentosum* and Werner syndrome [1, 3].

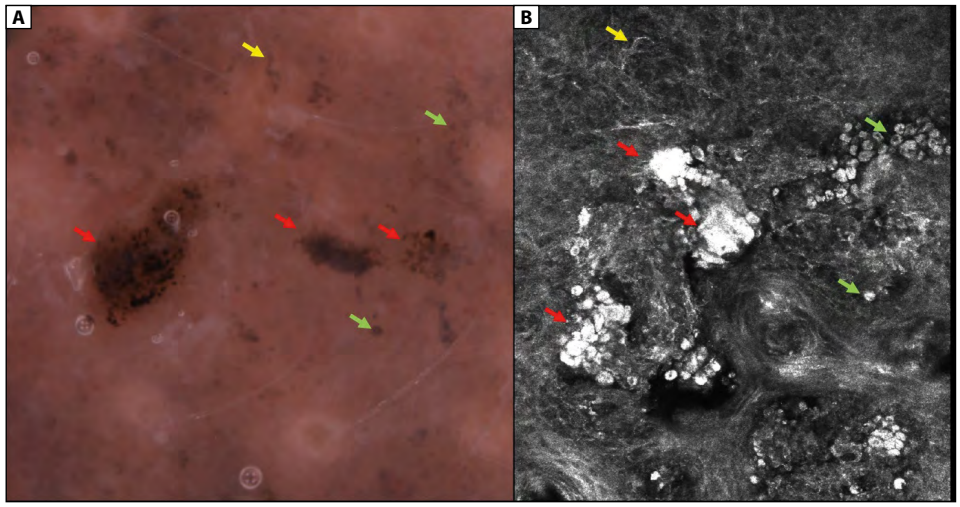

Figure 3. Correlation of findings between (**A**) high-magnification dermoscopy and (**B**) reflectance confocal microscopy (RCM). Dendritic melanocyte observed under (**A**) high magnification dermoscopy (*yellow arrow*) corresponding in RCM with pagetoid dendritic cell (*yellow arrow*). Clusters of atypical (irregular in shape and size) roundish melanocytes were marked with *red arrows* and single roundish nucleated melanocytes — with *green arrows*

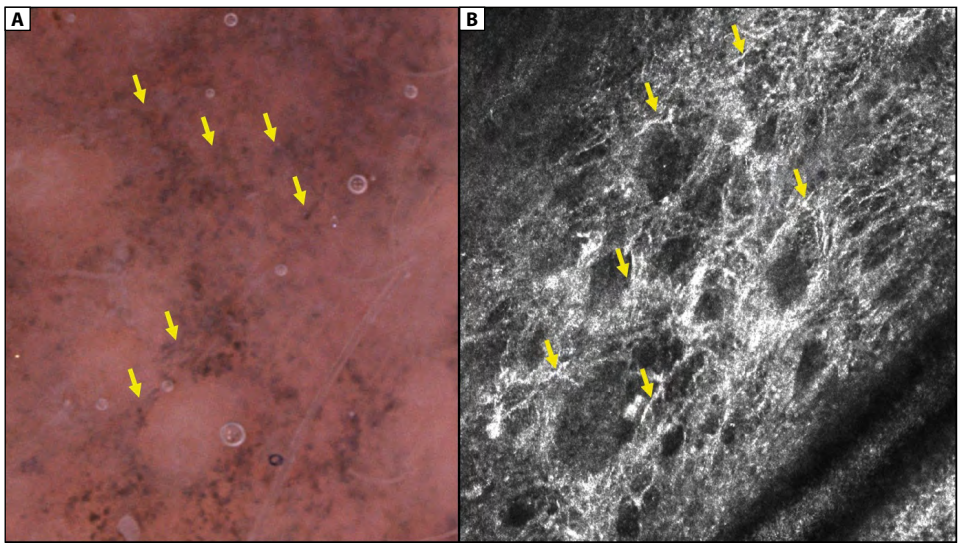

Figure 4. Correlation of findings between (**A**) high-magnification dermoscopy and (**B**) reflectance confocal microscopy (RCM). Numerous dendritic melanocytes observed under (**A**) high magnification dermoscopy (*yellow arrows*) corresponding in RCM with pagetoid dendritic cells showing folliculotropism (*yellow arrows*)

Clinically, LM usually presents as a brown, slowly enlarging macule with indeterminate borders. In perioral locations, it may spread to the oral mucosa [3]. Rarely, LM may present as an amelanotic lesion, appearing as a gradually enlarging erythematous macule [1]. The development of a nodule or papule, as well as a change in the colour of the lesion, may indicate the progression of LM to lentigo maligna melanoma (LMM) [3]. Differential diagnoses include solar lentigo, seborrheic keratoses, pigmented actinic keratosis, lichen planus-like keratosis, or pigmented basal cell carcinoma [5, 6]. LM is limited to the epidermis and appendages [2]. Therefore, it has a good prognosis (5-year survival is excellent) but can transform into LMM when the malignant cells cross the basement membrane and spread to the dermis [2]. LMM constitutes one of four subtypes of invasive melanoma [3]. The risk of progression of LM to LMM varies widely and, according to various studies, ranges between 5% and 50% [1, 7].

The gold standard for diagnosis is excisional biopsy. However, in case of large lesions located on the face or neck, full-thickness incisional biopsies or multiple punch biopsies may be also performed [1, 3]. Dermoscopy-guided biopsy

has recently been playing a significant role in the clinical management of LM [8]. On histological examination, LM is characterised by a proliferation of atypical melanocytes at the dermal-epidermal junction with co-existing features of increased sun damage (atrophy and solar elastosis) [3, 5]. Nests of melanocytes that vary in size and shape and single abnormal melanocytes may be present. In addition, an asymmetry in the distribution of melanocytes, melanin and lymphocyte infiltration is noticeable [3].

The first choice for the treatment of LM is surgery. Several surgical techniques have been utilized, including wide local excision (WLE), staged surgical excision (SSE) and Mohs micrographic surgery (MMS). SSE and MMS show the lowest recurrence rates [9, 10]. Modified Mohs surgery and staged excision/Slow-Mohs surgery constitute other techniques used in the treatment of LM [9]. Dermoscopy has become a useful tool for LM surgery to determine margins and, therefore, to obtain better cosmetic results [11, 12]. Cryotherapy and radiotherapy are treatment options for patients who do not qualify for surgery [7, 10]. The use of 5% imiquimod has also been trialled in recent years — data on its efficacy are conflicting [13].

Non-invasive imaging techniques constitute important auxiliary tools in the diagnosis and treatment monitoring of LM. On dermoscopy, the most typical features for LM are: asymmetric pigmented follicular openings, focal broadening or accentuation (especially at the periphery) of pigmented pseudonetwork, a follicular "circle within a circle" pattern, dark rhomboidal structures (angulated lines), grey dots or granules (peppering) and slate-gray globules [6, 14]. The progression of LM may be followed with dermoscopy. Initially, small dots and globules localise around the follicular orifices to form branching streaks (annular-granular pattern). In the next step, an asymmetric hyperpigmented rim appears in part of the hair follicle. As LM grows, more and more streaks develop, and eventually merge and fuse into rhomboidal structures. Homogeneous areas then appear in the lesion, initially respecting the hair follicle, but subsequently leading to obliteration. Aggregates of melanin-laden macrophages found in the dermis correspond with slate-grey dots and globules on dermoscopy and may be indicative of regression [15].

In RCM, the two main features of LM are nonedged dermal papillae and round large pagetoid cells. Secondary features are nucleated cells in dermal papillae, atypical cells at the dermo-epidermal junction (DEJ) or hair follicles and melanophages in the superficial dermis [16, 17]. In the LM diagnosis, RCM was shown to have a sensitivity of 85–100% and specificity of 71–76% [14, 18]. RCM can be useful in diagnosing cases of LM with non-specific pigmentation or with inflammation caused by previous treatment. In addition, it can be used to map the lesions and determine their margins or typify biopsy sites [4, 18]. RCM is also used to monitor lesion recurrence but is not suitable for evaluation in invasive lesions [1].

Recently, super-high magnification dermoscopy has been demonstrated to enable visualization of single-pigmented cells, thus aiding in the diagnosis of LM [19]. In the study by Cinotti et al. [19], roundish or dendritic melanocytes, the presence of melanocytes irregular in shape and size, or irregularly arranged, as well as folliculotropism of melanocytes, were more commonly observed in LM than in benign pigmented macules. In the presented case, similar roundish and dendritic melanocytes of irregular shape, size and arrangement were observed under high-magnification dermoscopy. These features correlated closely with the findings in RCM (Fig. 3, 4).

The presented case is also of interest due to other aspects. The auricle belongs to uncommon locations of LM and only single cases reported dermoscopic findings [20–22]. Another controversial issue is the development of junctional nevus on sun-damaged skin of the head and neck area. This concept has been questioned by international experts [23]. In the presented patient, despite non-invasive imaging findings suggestive of LM, initial histopathological diagnoses were consistent with junctional nevus. Taking into account the suspicious dermoscopic and RCM findings and the fact that the presence of a junctional nevus on sun-exposed skin in an elderly patient is questionable, conducted were further follow-up visits. It should be remembered that such patients should not be sent home satisfied, because they may return after some time with an invasive melanoma.

CONCLUSIONS

The assessment of pigmented lesions on chronically sun-exposed skin of the face may be a diagnostic challenge. Based on the presented patient, the authors would like to question the existence of a junctional nevus on the head and neck in the elderly population and recommend special vigilance in such cases.

Article information and declarations

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Author contributions

Conceptualization — KKW and MŻ; resources — KKW and MŻ; writing: original draft preparation — KKW and MW; writing: review and editing — KKW, MW, MŻ; visualization — MŻ; supervision — MŻ.

Conflict of interest

The authors report no competing interests.

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Ethics statement

The patient gave informed consent for the publication of the images.

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