

Malignant melanoma: clinical and digital dermoscopy combined with colour doppler skin ultrasound

Melanoma maligno: clínica e dermatoscopia digital combinada com ecografia cutânea com padrão doppler colorido

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The diagnosis of malignant melanoma using digital dermoscopy, combined with cutaneous ultrasound employing color Doppler imaging, is a powerful approach for the early detection of the tumor and subsequent therapeutic management. It provides a real-time, qualitative assessment of the direction and velocity of blood flow, allowing for the identification of flow abnormalities such as turbulence, blockages, or abnormal flow patterns.

A 67-year-old male, phototype 2, Dutch patient came to the clinic with a dark brown, asymmetric lesion of the left arm with 15 mm largest diameter and 1 year of evolution (Fig. 1). The clinical history reported no significant sun exposure, but the patient had also a nodular tumor on his back.

Dermoscopy revealed disorganized and irregular pigment network, with dark brown to black dots and globules scattered across the lesion with a central area showing whitish, structureless zones, whitish streaks and shiny vascular structures (Fig. 2).

A GE ultrasound machine with a high-frequency probe (20 HZ) with color Doppler revealed increased blood flow within the lesion. The irregular and chaotic branching of the vessels is a hallmark of tumor



Figure 1. Asymmetric dark brown tumor.

neovascularization. The velocity scale indicates blood flow, at relatively low velocities typical of tumors where newly formed vessels may be tortuous or inefficient. The underlying hypoechoic area represents the melanoma itself, which is typically less echogenic (darker) on ultrasound compared to surrounding tissue. The surrounding tissue and vessels may also be compressed or displaced by the tumor supporting the notion of an invasive lesion (Fig. 3).

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Received: 16-10-2024

Accepted: 23-11-2024

DOI: 10.24875/PJDV.24000085

Available online: 05-03-2025

Port J Dermatol and Venereol. 2025;83(2):151-152

www.portuguesejournalofdermatology.com

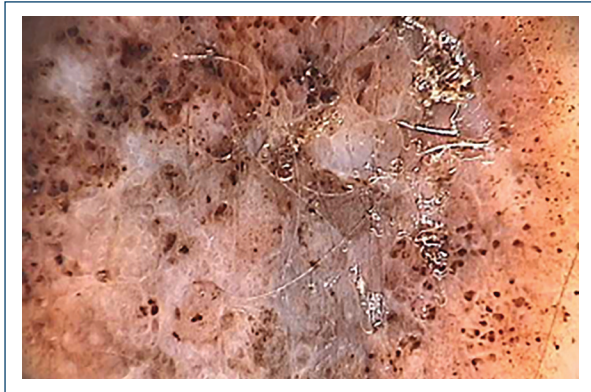


Figure 2. Irregular dark brown to black dots and globules scattered across the lesion.

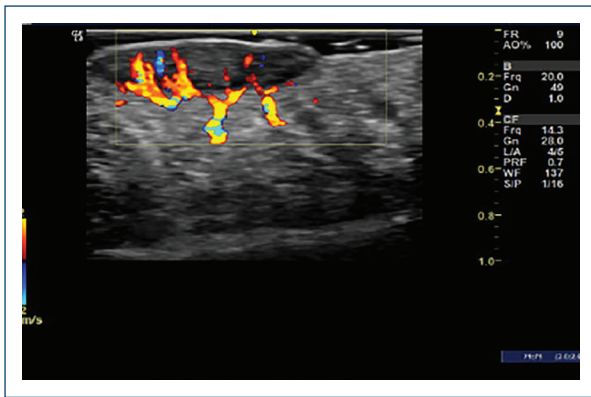


Figure 3. Irregular and chaotic branching vessels.

Based on the clinical, dermoscopic and echographic assessments, a clinical diagnosis of malignant melanoma was made¹⁻³.

Histopathological analysis revealed nodular melanoma with a maximum thickness of 0.65 mm. The absence of lymphovascular permeation, neurotropism, satellitosis or regression, as well as ulceration,

was noted. Mitotic activity of 1 atypical mitosis figure/mm².

According to the AJCC staging system, this lesion is classified as T1a, and the patient was treated with a surgical margin of 1 cm.

Funding

None.

Conflicts of interest

None.

Ethical considerations

Protection of humans and animals. The authors declare that no experiments involving humans or animals were conducted for this research.

Confidentiality, informed consent, and ethical approval. The authors have followed their institution's confidentiality protocols, obtained informed consent from patients, and received approval from the Ethics Committee. The SAGER guidelines were followed according to the nature of the study.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

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