



Decoding Negative Pigment Network

Luísa Polo-Silveira¹, Alon Scope², Joelle Feghali¹, Klaus Busam¹, Ashfaq Marghoob¹

¹ Dermatology Service, Department of Medicine, Memorial Sloan Kettering Cancer Center, New York, U.S.A.

² The Kittner Skin Cancer Screening & Research Institute, Sheba Medical Center, Ramat Gan and Gray Faculty of Medical and Health Sciences, Tel Aviv University, Tel Aviv, Israel

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Corresponding Author: Luísa Polo Silveira, 530 E 74th St, 10021 New York, NY. ORCID: 0000-0003-1728-8058. E-mail: luisa.polo.silveira@gmail.com

Introduction

The terms negative network (NN), negative pigment network (NPN), inverse network, and reticular depigmentation (RD) have been used interchangeably to describe what was assumed to be a single dermoscopic feature with the same histopathological correlation. However, distinct dermoscopic morphologies of NPN have been reported in the literature, likely representing different underlying histopathological correlates [1]. Originally used in 1990 to describe Spitz nevi, the histopathological basis of RD has remained poorly understood [2]. The term NPN was introduced in 1996 as a synonym for RD and was subsequently observed in melanomas, melanocytic nevi, and dermatofibromas [3]. In 2012, Pizzichetta et al. demonstrated that shiny white lines (SWL), when oriented orthogonally, can mimic NPN and proposed subdividing NPN into Type A, characterized by serpiginous hypopigmented lines forming a network around areas with brown elongated globular to tubular structures, and Type B, characterized by the replacement of brown areas with dotted

vessels [1]. Despite these insights, inconsistent terminology persisted, prompting the 2016 International Society of Dermoscopy consensus to define NPN as an umbrella term encompassing both inverse network and RD while classifying SWL separately [4]. Given the variability in NPN appearances and, therefore, probable distinct histopathological correlates, we propose revising the terminology to reduce ambiguity.

Findings

The dermoscopic-histopathological correlation of NPN identifies two components [5]. The first consists of brown elongated-to-curvilinear globular structures, which histopathologically correspond to confluent junctional melanocytic nests, that extend along multiple adjacent rete ridges and protrude into the dermal papillae (DP). The second component features interconnecting hypopigmented lines surrounding these globular structures, correlating with broadened interpapillary rete ridges. The presence of

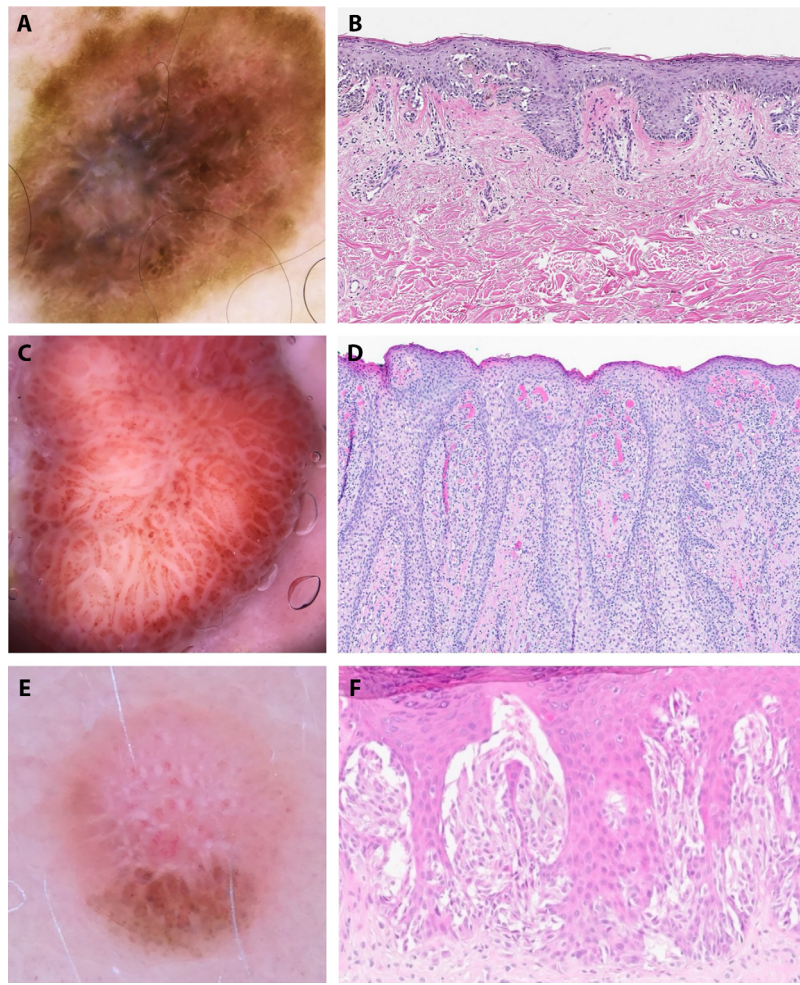


Figure 1. The three different types of negative network. A: Superficial spreading melanoma: Dermoscopy reveals a negative network, more prominent in the lower portion of the lesion, with elongated tubular globules, characterized as a ‘negative pigment network’(NPN). B: Superficial spreading melanoma: Histopathology demonstrates a junctional proliferation of melanocytes with effaced rete ridges ("consumption of the epidermis") and dermal fibrosis. C: Clear cell acanthoma: Dermoscopy shows a negative network throughout the lesion, described as ‘non-pigmented reticular depigmentation’ (non-pigmented RD) with vascular proliferation. D: Clear cell acanthoma: Histopathology shows elongated rete ridges surrounding hypervascular dermal papillae (DP) exhibiting a proliferation of blood vessels. E: Pigmented Spitz tumor: Dermoscopy reveals a negative network across the pigmented portion of the lesion, described as “pigmented reticular depigmentation” (pigmented RD). F: Pigmented Spitz tumor: Histopathology shows elongated rete ridges surrounding nests of melanocytes.

elongated globular structures suggests that proliferating melanocytes have effaced the normal undulating rete ridge pattern and explains why this feature is associated with nevus-associated melanoma (Figures 1A–B), dysplastic nevi, and small congenital nevi.

RD, distinct from NPN, presents dermoscopically as hypopigmented lines surrounding roundish areas with vessels or pigment. Histopathologically, RD is characterized by widened, but not effaced, rete ridges with proliferation of vessels and/or melanocytes within the DP. Differential diagnoses for non-pigmented RD include clear cell acanthoma (Figures 1C–D), dermatofibroma, fibroepithelioma of Pinkus,

non-pigmented Spitz nevi, and amelanotic melanoma. In contrast, the differential diagnoses for pigmented RD, where DP contain melanocytic nests, include de novo melanoma and pigmented Spitz nevus (Figures 1E–F).

SWL represents a separate entity seen only under polarized dermoscopy. Histopathologically, SWL correspond to stromal fibroplasia and collagen thickening [6]. Dermoscopically, it appears as short white lines oriented parallel and orthogonal to each other, forming a network-like pattern consisting of square-like structures. The differential diagnoses include melanoma, Spitz nevus, and dermatofibroma.

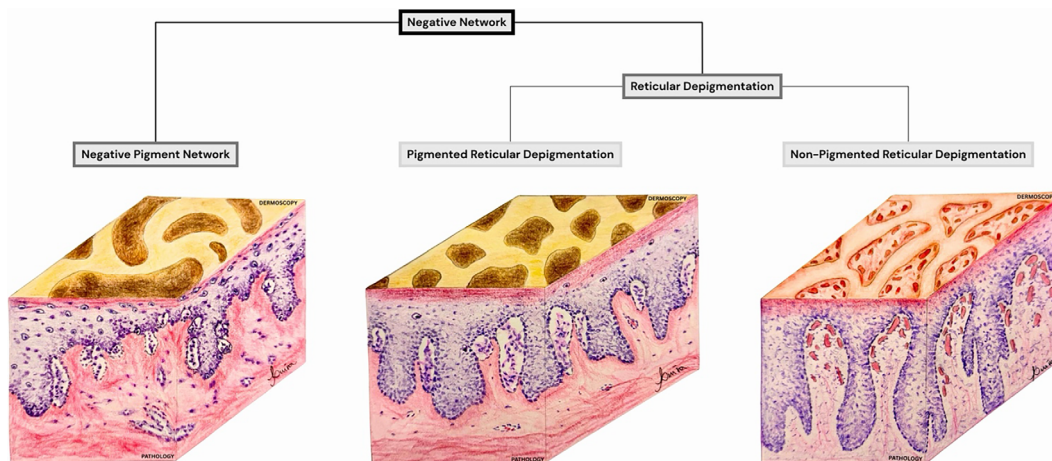


Figure 2. Proposed classification and dermoscopic–histopathological correlation of negative network (NN). Fluxogram illustrating the proposed classification of (NN) into three distinct subtypes: negative pigment network (NPN), pigmented reticular depigmentation (pigmented RD), and non-pigmented reticular depigmentation (non-pigmented RD). Each subtype is represented by a scheme correlating its dermoscopic appearance with the underlying histopathology: NPN shows elongated globules corresponding to confluent junctional nests and effaced rete ridges; pigmented RD highlights widened rete ridges surrounding melanocytic nests within dermal papillae; non-pigmented RD depicts widened rete ridges associated with dermal papillae harboring a vascular proliferation.

Conclusion

We propose "negative network" (NN) as a broad term encompassing two subtypes, both seen under polarized and non-polarized light (Figure 2). The first, NPN, describes an NN formed by brown elongated globules surrounded by hypopigmented serpiginous lines. The second, RD, describes hypopigmented lines that outline areas lacking elongated globules but containing either vessels (non-pigmented RD) or pigment (pigmented RD). By standardizing this terminology, we aim to reduce diagnostic confusion and improve accuracy in clinical differential diagnosis.

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