PREDICTION without PIGMENT

A Decision Algorithm for Non-Pigmented Skin Malignancy

Cliff Rosendahl[1], Alan Cameron[1], Agata Bulinska[1], Philipp Tschandl[2], Harald Kittler[2]

1. School of Medicine, The University of Queensland, Australia
2. Department of Dermatology and Venereology, Medical University of Vienna, Austria

The method presented here is a diagnostic tool, but no method, including this one, can be guaranteed to detect every malignancy
In particular, any Elevated, Firm, Growing (EFG) lesion should be excised[1]

Clues to Diagnosis

Although non-pigmented skin lesions lack clues of melanin structures, there are other useful non-vessel clinical and dermatoscopic clues that take priority.

Ulceration without a history of trauma should be regarded as a clue to malignancy. It is commonly present in BCC and even when not evident clinically it may often be identified by the presence of adherent fibre observed dermatoscopically.[2]

White clues* include dermatoscopic white lines as well as (in the case of raised lesions only) clues produced by keratin both on the surface of the skin (evident as scale) and beneath the stratum corneum where it appears in the form of dermatoscopic white circles and white structureless areas.[3] *For this purpose white clues do not include white dots or clods (so-called 'milia-like cysts') which can occur in malignant conditions but which are also common in seborrhoeic keratoses.*
Dermatoscopic white lines of any type, including perpendicular white lines (polarising-specific) are a clue to malignancy. Perpendicular white lines seen with polarised dermatoscopy are a published clue to BCC and melanoma as well as to the benign conditions Spitz naevus, DF, LPLK and scar tissue.[4] The authors have also seen them in IEC and PG. White lines seen with non-polarising dermatoscopy can be a clue to both melanoma and BCC[2] but they also are not specific to malignancy.
In raised lesions, the keratin clues of dermatoscopic white circles, dermatoscopic white structureless areas and surface keratin are clues to SCC and KA.[3]
For the purpose of this algorithm a **raised lesion** is one with a significant visibly or palpably raised contour or with the dermatoscopic clue to a raised lesion of looped vessels.

Vessel type can be as dots, clods, linear, looped, curved, serpentine, helical or coiled and **vessel arrangement** can be random (non-specific), clustered, serpiginous, linear, centred, radial, reticular or branched.[2] A **monomorphous** vessel pattern consists of vessels of a single type sufficient to form a pattern. If there is more than a single vessel pattern or if more than one vessel type is present in significant quantities throughout the lesion in a speckled distribution the pattern is termed **polymorphous**.[5]

References

1. Chamberlain AJ, Fritschi L, Kelly JW. Nodular melanoma: patients' perceptions of presenting features and implications for earlier detection. J Am Dermatol 2003; 48:694-701.
2. Kittler H, Rosendahl C, Cameron A, Tschandl P. Dermatoscopy www.Facultas pages 179-193.
3. Rosendahl C, Cameron A, Argenziano G, Zalaudek I, Tschandl P, Kittler H. Dermoscopy of squamous cell carcinoma and keratoacanthoma. Arch Dermatol. 2012 Dec 1;148(12):1386-92.
4. Balagula Y, Braun RP, Rabinovitz HS, Dusza SW, Scope A, Liebman TN, et al. The significance of crystalline/chrysalis structures in the diagnosis of melanocytic and nonmelanocytic lesions. J. Am. Acad. Dermatol. 2012 Aug;67(2):194.e1-8.
5. Kittler H, Riedl E, Rosendahl C, Cameron A. Dermatoscopy of unpigmented lesions of the skin: a new classification of vessel morphology based on pattern analysis. Dermatopathology: Practical & Conceptual 14, no. 4 (December 2008).

Abbreviations

BCC - Basal cell carcinoma
SCC - Squamous cell carcinoma
SK- Seborrhoeic keratosis
DF - Dermatofibroma
KA - Keratoacanthoma
IEC - Intra-epidermal carcinoma (Bowen's disease or SCC in-situ)
LPLK - Lichen planus like keratosis
CCA - Clear cell acanthoma
PG - Pyogenic granuloma

If you cannot make a confident clinical diagnosis of solar or seborrhoeic keratosis, viral wart, dermal naevus or benign cyst then apply this algorithm:-

Prediction without Pigment - short version

- Non-pigmented lesion
  - Ulceration or white clues* present — **Consider Biopsy (exclude malignancy)**
  - Ulceration or white clues* not present — **Apply vessel pattern analysis[2] (see below)**
    A polymorphous pattern including dots is strongly suspicious for melanoma
    A clods-only pattern, and in raised lesions a centred or serpiginous pattern, should be benign. All other patterns must be assessed for malignancy.

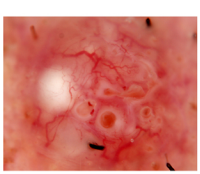
A **clods-only pattern** must have no vessels within the (red/purple) clods. A centred pattern must have vessels centred in **skin-coloured** clods.

Prediction without Pigment - full version

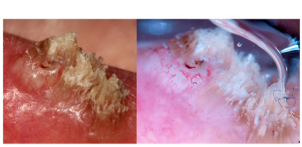
- Non-pigmented lesion
  - Ulceration or white clues* present — **Consider Biopsy (exclude malignancy)**
    Ulceration: BCC, SCC, Melanoma
    White clues (lines): BCC, Melanoma, Spitz naevus, DF, LPLK, PG
    White clues (other): SCC/KA
  - Ulceration or white clues* not present
    - Flat
      - Polymorphous vessels
        - Vessels as dots present — **Biopsy (exclude melanoma)**
        - Vessels as dots not present — BCC, IEC, SK, LPLK
      - Monomorphous vessels
        - Dots, serpentine or coiled — **Dots**: Melanocytic naevus, IEC, viral wart, inflammation/psoriasis
          Serpentine: BCC, scar
          Coiled: IEC, SK
        - Clods (red/purple) — **Clods: Haemangioma**
          (There must be no vessels within clods)
    - Raised
      - Vessel arrangement non-specific (random) (includes no vessels seen)
        - Not only clods — Melanoma
          BCC, SCC/KA, SK, PG
        - Only clods(red/purple) — **Haemangioma, haemorrhage**
          (There must be no vessels within clods)
      - Vessel arrangement specific
        - Radial or branched — **Radial**: KA/SCC, BCC with ulceration, sebaceous gland hyperplasia, molluscum
          Branched: BCC, SCC/KA, Merkel cell carcinoma, any raised cyst or neoplasm
        - Serpiginous or centred — **Serpiginous: CCA**
          Centred: SK, viral wart, dermal naevus

(A centred pattern must be in **SKIN-COLOURED** clods)

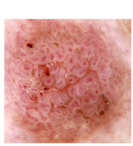
(Other specific vessel arrangements (clustered, linear and reticular) are not commonly encountered in a raised lesion and if present should be assessed as 'non-specific' for the purpose of this flowchart).



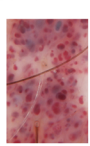
'White clues' (white circles in a raised lesion) are present so a decision to biopsy can be made without vessel pattern analysis. This is a dermatoscopic image of an SCC.



Clinical (left) and dermatoscopy (right) images of this lesion on an ear reveal that it is raised with 'white clues' of surface keratin and a white structureless area. It is an SCC.



Ulceration or 'white clues' are not present. Vessel pattern analysis reveals a centred vessel pattern (the vessels must be centred in **skin-coloured** clods) consistent with a benign diagnosis. This is a seborrhoeic keratosis.



There is no ulceration and no 'white clues'. The vessel pattern is **(red/purple)** clods-only consistent with the benign diagnosis of haemangioma. This pattern must not have any vessels within the clods to be interpreted as benign.

23-7-2013