Breslow thickness

Reason/Evidentiary Support:

Breslow thickness is the single most important prognostic factor for clinically localised primary melanoma.[1] Breslow thickness is measured from the top of the granular layer of the epidermis (or, if the surface is ulcerated, from the base of the ulcer) to the deepest invasive cell across the broad base of the tumour (dermal/subcutaneous) as described by Breslow.[2-4] Deep, vertical extensions of the tumour, perpendicular to the base should be assumed to be periadnexal and should not be included in the Breslow thickness.

To promote consistency in the evaluation of the Breslow thickness the following points are worthy of note:

1. The Breslow thickness can only be evaluated accurately in sections cut perpendicular to the epidermal
   surface. Otherwise, a note should be included indicating that "the section is cut tangentially and an accurate Breslow thickness cannot be provided." Nevertheless, in some tangentially cut sections, it is
   often still possible to report a tangentially measured tumor thickness. The latter may be clinically useful,
   because it can be reasonably inferred that the true Breslow thickness must be less than this measurement, and, when appropriate, this should be stated clearly in the report. At other times, particularly when the epidermis is not visualized, no tumor thickness can be provided, and supplementary prognostic information must be obtained from other factors (including ulceration, mitotic rate, and Clark level). When sections have been tangentially cut, it may be fruitful to melt the paraffin block and reembed the tissue as it may then be possible to obtain perpendicular sections for determination of the Breslow thickness.
2. The Breslow thickness should be measured in the standard way when there is dermal regression (ie dermal regression extending to a greater thickness than the melanoma should not be included in the measurement of Breslow thickness).
3. In the case of periadnexal extension of melanoma (ie in the adventitial or extra-adventitial tissue immediately adjacent to skin appendageal structures usually apparent as an extension or "tongue" of tumor extending beyond the depth of the main tumor mass), it is uncertain from current evidence where the measurement of tumour thickness should be made to most accurately predict patient prognosis. (This does not include adnexal involvement by melanoma, which is regarded as in situ disease.) It is generally agreed that thickness measurements should not be based on periadnexal extension (either periadnexal adventitial or extra-adventitial extension), except when it is the only focus of invasion. In that circumstance, Breslow thickness may be measured from the inner layer of the outer root sheath epithelium or inner luminal surface of sweat glands, to the furthest extent of infiltration into the periadnexal dermis. The depth of extension of such foci beneath the granular layer of the epidermis may also be measured and reported (but it should be clearly stated how the measurements were obtained and that the periadnexal measurement represents the estimated "true" Breslow thickness).
4. The Breslow thickness cannot be determined if a superficial biopsy transects a melanoma and includes only its superficial portion. In such instances, the pathologist can only report the melanoma to be 'at least' a certain thickness. Correlation with the re-excision specimen is necessary.
5. Other problems may arise from differing interpretations of the nature of dermal cells (ie whether they represent melanoma or a pre-existing naevus) and of tumours with verruciform architecture.
6. The inclusion of neurotropic spread of melanoma in the measurement of Breslow thickness is controversial. In this instance, it is recommended that the thicknesses of the tumour including and excluding the neurotropic component be recorded in the pathology report.
7. Satellites, as discussed in detail below, are foci of tumor discontinuous from the primary melanoma (probably representing local metastases) and should not be included in the measurement of tumor thickness.
8. In some instances, particularly when a melanoma arises in association with a nevus, it may be difficult to distinguish small "nevoid" melanoma cells from nevus cells, and this may have implications for measuring tumor thickness. Careful assessment of architectural and

especially cytologic features should assist in distinction, but at times this remains difficult, subjective, and prone to interobserver variability.

The standard method for measurement of tumour thickness in ulcerated lesions may lead to an underestimate of thickness, because the recommended measurement from the base of the ulcer to the base of the tumour makes no allowance for the amount of tumour lost through ulceration.

The thickness (measured from the top of the granular layer) of any zone of regression may also be recorded in the pathology report (but does not represent the Breslow thickness).

References:

1. Azzola MF, Shaw HM, Thompson JF, Soong S-J, Scolyer RA, Watson GF, Colman MH, Zhang Y. Tumor mitotic rate is a more powerful prognostic indicator than ulceration in patients with primary cutaneous melanoma. Analysis of 3661 patients from a single center. Cancer 2003;97(6):1488–1498.
2. Breslow A. Thickness, cross-sectional areas and depth of invasion in the prognosis of cutaneous melanoma. Annals of Surgery 1970;172(5):902–908.
3. Scolyer RA, Mihm Jr MC, Cochran AJ, Busam KJ, McCarthy SW. Pathology of melanoma. In: Balch CM, Houghton Jr A, Sober A, Soong SJ, editors. Cutaneous Melanoma. 5 ed. St. Louis, Missouri: Quality Medical Publishing; 2009. p 205–248.
4. Edge SE, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A, editors. AJCC Cancer Staging Manual 7th ed.: New York, NY.: Springer; 2010.