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EDITORIAL

Current perspectives in diagnostic melanocytic tumour pathology

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Scientific advances in the field of melanocytic tumour pathology have increased at a breath-taking pace over the past 50 years. Work throughout the 19th century, primarily based on morphology, established melanoma as a distinct cellular disease. The late 1960s and 1970s saw the pioneering work of Clark and Breslow delineating the prognostic value of tumour thickness in patient outcome. The 1980s saw the development of melanocytic immunohistochemistry, while the early 1990s ushered in Morton's technique of sentinel lymph node biopsy. The late 1990s and early 2000s saw the description of specific molecular abnormalities in naevi and melanoma. More recently, the development of BRAF, CTLA-4 and PD-1 inhibitors have led to completely novel treatment options for melanoma.[1] A representative sample of the most important recent work in diagnostic melanocytic tumour pathology has been distilled into this special issue. This special edition contains concise reviews and original research presented by leading world experts in melanocytic tumour pathology at the recent International Academy of Pathology (IAP) World Congress melanocytic tumour pathology course held in Sydney, Australia (11–15 October 2022). It is our privilege to compile this outstanding work into a useful compendium of up-to-date information aimed at the practising surgical pathologist, clinicians involved in the care of patients with melanocytic lesions and medical trainees.

The first article lays the foundation for all to come! In it, Maher *et al.* cover the biology and genetics of common benign melanocytic tumours such as acquired and congenital naevi. Insights into naevus aetiology and melanogenesis are discussed.[2]

Dr Yeh then discusses the classification of melanocytic naevi based on clinical, histopathological and genetic features as well as the concept of 'intermediate melanocytic tumours' or melanocytomas, with discussion of the histological immunophenotypical and molecular features of specific recognised subtypes.[3]

The blue spectrum of melanocytic lesions is composed of benign, intermediate and malignant tumours which may be difficult to separate from other dermal based melanocytic proliferations. These lesions have varying and distinct histological and molecular features, some of which have been recently described. Dr de la Fouchardiere covers blue naevi and the blue spectrum of tumours in his review of this evolving spectrum of lesions.[4]

Spitzoid neoplasms continue to be diagnostically challenging for both general surgical pathologists and dematopathologists alike. Advances in molecular sequencing have led to progress in the classification, diagnosis, and prognostication of these lesions. Several subtypes of spitzoid lesions have been identified based on genomic aberrations, which correlate with histomorphology and clinical outcome. Hagstrom *et al.* provide an update on the genomic aberrations seen in Spitz naevi and tumours. Characteristic histological features of various fusion subtypes as well as prognostic biomarkers are discussed.[5]

It is desirable to recognise melanocytic tumours that have the potential to cause mortality with high sensitivity to identify cases with risk of progression. This quest for high sensitivity inevitably leads to loss of specificity. For this reason, many lesions diagnosed as melanoma will not cause the death of the patient, with or without therapy. This phenomenon has been termed 'overdiagnosis'. The contribution by Elder *et al.* considers the concept of diagnostic error in relation to diagnostic uncertainty and melanoma overdiagnosis.[6]

Two original studies on desmoplastic melanoma have been included in this special issue. In the first, Rawson *et al.* report on the representativeness of initial skin biopsies showing pure desmoplastic melanoma and their implications for subsequent management.[7] In the second, Lezcano *et al.* present their findings on interobserver agreement in the histopathological classification of desmoplastic melanoma.[8]

Tumour regression is an immunophenotypically driven process that results in complete or partial dissolution of tumour cells which may be appreciated in histological sections as zones of fibrosis, angioproliferative change and inflammation. Dr Aivazian reviews how sustained progress in the understanding of the pathogenesis of melanoma regression has led to the identification of therapeutic targets and the development of immune checkpoint inhibitors for the treatment of advanced melanoma.[9]

The histopathological diagnosis of cutaneous melanoma is fraught with potential pitfalls as numerous and varied histological patterns as well as rare and unusual variants of melanoma, both primary and metastatic, may be encountered. Dr Lowe reviews the current state of our understanding of the histological patterns of metastatic melanoma and select rare melanoma variants.[10]

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Given the exponential growth in the availability of specialised assays, the diagnostic work-up of melanocytic tumours has undergone significant changes in recent years. In his review, Dr Andea presents an updated synopsis of major ancillary molecular tests useful to the surgical pathologist for melanocytic tumour diagnosis.[11]

Finally, Saleh *et al.* provide an in-depth review highlighting the key diagnostic pathological features, molecular genetics, differential diagnosis and treatment of mesenchymal tumours demonstrating melanocytic differentiation. They stress the fact that surgical pathologists must be aware of these lesions as they pose a diagnostic challenge in that they frequently demonstrate overlapping clinical, morphological and immunophenotypic features with melanoma.[12]

The authors greatly appreciate the opportunity to curate this collection of cutting-edge articles on the current state of diagnostic melanocytic tumour pathology. We would like to express our sincere gratitude to our colleagues who made this special edition of *Pathology* possible with their outstanding contributions. We would also like to express our sincere appreciation to the Editor-in-Chief, Professor Richard Scolyer, for entrusting us with this rewarding task. Finally, the editors are supremely grateful to our Editorial Manager Ms Belinda Neill for her constant support. This project could not have been completed without her tireless efforts.

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