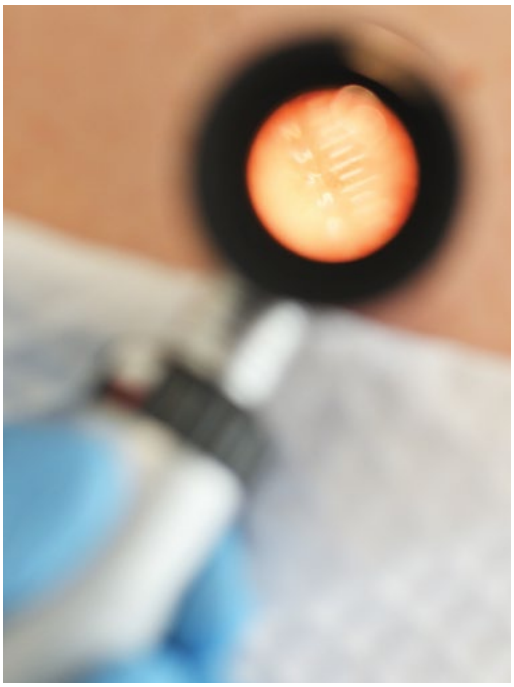
Skin cancer management: Making the most of your pathologist



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Background
Australia has the highest incidence of skin cancer globally. Early detection and treatment of skin cancer is critical for positive patient outcomes. General practitioners (GPs) play a central role in skin cancer management in Australia.

Objective
Collaboration between GPs and pathologists can improve the accuracy of skin cancer diagnosis. However, for improvement to occur, clear communication and high-quality specimens are essential.

Discussion
Inadequate clinical information and suboptimal biopsy specimens can hinder diagnosis. Improved communication, targeted training and selecting appropriate biopsy techniques are essential. A collaborative approach, guided by recommended techniques and clear guidelines, can minimise errors and improve patient outcomes in Australia's GP-led skin cancer management system.

AUSTRALIA has the highest incidence of skin cancer globally. It has been estimated that in 2024, the healthcare costs for the three most common types of skin cancer – basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and melanoma – will exceed $1 billion.[1] Each year, Australians experience an incidence of skin cancer far exceeding that in other populations, with two in three Australians diagnosed with skin cancer by the age of 70 years. For the most common forms – BCC, SCC and melanoma – vary widely in their presentation and prognosis and the complexity of treatment required. Among these, melanoma is particularly notable for its potential for fatal outcomes if not detected and treated early.

The high incidence and substantial burden of skin cancer in Australia not only reflect demographic and environmental factors, such as high levels of solar radiation, but also highlight the critical role of primary healthcare providers in managing this group of malignancies.[2] In contrast to other countries where dermatologists or surgeons manage most skin cancers, in Australia, general practitioners (GPs) manage the majority, playing a pivotal role in the detection, diagnosis and definitive treatment of skin cancers.[3]

This primary care-led approach is supported by Australia's healthcare infrastructure, which facilitates the GP's role in skin cancer management through initiatives like skin cancer clinics and dedicated training programs in dermatoscopy and surgical skills. However, this model also results in a unique set of responsibilities and challenges for GPs, who must possess a high degree of skill in diagnostic and treatment procedures, as well as in navigating the complexities of when to refer patients to specialist care.

The histopathological evaluation of skin cancer is largely subjective. In most cases, the essential elements of a pathology report, diagnosis, evaluation of prognostic features and assessment of margin status (where relevant) are reliable. That is, the observations of one pathologist are likely to be repeated by a second pathologist and by the first pathologist on a second occasion. In certain situations, however, reliability is suboptimal, especially in the grading of dysplasia of naevi,[4] the subtyping of BCCs,[5] and the distinction between solar keratoses and invasive SCC.[5] Furthermore, the evaluation of prognostic features[6] and margin status[7] might present problems of poor concordance.

In this setting, the collaboration between GPs and pathologists becomes critical. It is common knowledge that accurate histopathological diagnosis by pathologists informs clinical management decisions,

affecting patient outcomes significantly. However, the nuances of interpreting pathology reports and the inherent limitations of histopathology might pose challenges, but these challenges can be mitigated by optimising communication between healthcare providers and the quality of skin pathology specimens.

Enhancing clinical communication and collaboration

The provision of comprehensive clinical data is deficient in many pathology specimen requests.[8] Ferrara et al showed improved diagnostic reliability (and pathologists' confidence) with increments in provided clinical information, including clinical and dermatoscopic images.[9] To facilitate this clinicopathological correlation, many Australian GPs send anonymised clinical and dermatoscopic images to the laboratory by email. An Australian study emphasised the risks of poor outcomes in cases where pathology request forms lacked adequate clinical information.[10] It follows that improving the quality of clinical information conveyed by GPs to pathologists could significantly elevate the diagnostic accuracy and outcomes in skin cancer management.

Similarly, clear communication of histopathological evaluation of specimens requires unambiguous reports that are aligned to recommended treatments and clearly articulate any diagnostic uncertainty. Inconsistent terminology and inadequate contextual details frequently impede interpretation by clinicians. Targeted educational training co-delivered by GPs and pathologists can provide a foundation for better comprehension of the information requirements of each group.

Improving the quality of specimens

The quality of skin cancer specimens, in terms of their nature and extent, has a profound effect on the pathologist's ability to make accurate assessments. In Australia, the *Skin cancer clinical guidelines* highlight the desirability of excisional biopsy specimens while recognising that such specimens are not always appropriate.[11] The selection of biopsy technique should take into account the location of the lesion within the various skin layers and also the need, in many instances, for the architecture of the lesion to be assessed.

Sampling techniques, other than excisional biopsy, should be used judiciously. Partial punch biopsies, particularly small diameter punch biopsies, are associated with a significant rate of misdiagnosis, while often not demonstrating a lesion. In one study, 7% of cases sampled by punch biopsy and initially diagnosed as actinic keratosis were later found to harbour BCC or SCC.[12] Although it is likely that routine sampling of excisional specimens might also overlook foci of invasive cancer, the excisional technique ensures that the lesion is extirpated.

Great caution is required in the biopsy of suspected melanoma. The *Clinical practice guidelines for the diagnosis and management of melanoma* advise that 'the optimal biopsy approach for a suspicious pigmented lesion is complete excision with 2 mm clinical margin and upper subcutis'.[13] Frequently a melanoma has its base transected in a shave biopsy specimen, limiting assessment of the Breslow thickness.[14]

More significantly, Kok et al, in a study based in Melbourne, showed that punch biopsy was associated with a false negative rate of diagnosis of more than 23% and shave biopsy with 4.5%, compared with less than 2% for excisional biopsy specimens.[10] These under-called cases were associated with adverse outcomes, persistence or progression in 11.6% of the erroneously diagnosed punch biopsy specimens and in 1.7% of the shaved specimens but in only 0.7% of the excisional specimens. It is noteworthy that most (78%) of the misdiagnoses made on small punch biopsy specimens were due to misinterpretation by pathologists, while the remainder were due to sampling issues.

Very superficial shave biopsy specimens and small punch biopsy specimens often present the laboratory with technical difficulties in the provision of satisfactory microscopy slides. Shave biopsy specimens that do not include the reticular dermis (ie less than around 1-mm thick) tend to curl during fixation, resulting in microscopic sections that might not demonstrate the lesion or can result in sections that are tangential to the surface. Likewise, small punch biopsy specimens often shrink differentially, resulting in a specimen that is a truncated cone rather than a cylinder. The microscopy slides produced are, consequently, often obliquely sectioned. These technical problems might account for some of the difficulties in the interpretation of skin cancer pathology.

Incisional biopsies (ie partial biopsies through the diameter of a lesion) are less frequently used than punch or shave biopsies but are an excellent technique as the resulting slides closely resemble those of the excisional biopsy.[15] An incisional biopsy allows the pathologist to evaluate the architecture of a lesion, and because the slides produced are identical, save for extent, to those of an excisional specimen, are likely to be associated with fewer diagnostic errors.

Ultimately, the goal of the biopsy is to achieve a balance between a minimally invasive procedure and the acquisition of pathologically valuable specimens. The choice of biopsy technique should be guided by the lesion's characteristics, the clinician's expertise and the available resources, aiming to maximise diagnostic accuracy while minimising patient discomfort, complications and the risk of incomplete excision, especially for those lesions where diagnostic discordance is relatively high. In these situations, complete excision ensures the lesion is destroyed, providing an added level of safety for the patient. Discussions with the pathologist can inform clinical decisions regarding the most appropriate biopsy technique.

Closing the loop

We have drawn attention to potential pitfalls in the pathological diagnosis of skin cancers. The harms that might result can be minimised with careful interpretation of the pathology report. Where there is discordance between the clinical and the pathological aspects, it is necessary for the clinician to ensure that the patient is managed correctly. Saving clinical and dermatoscopic images is important in this regard, as it provides a record that might be referred to once the pathology report has been received. It is customary to request that pathologists review the diagnoses in these situations, and because slides and tissue blocks are retained for many years, additional testing can be performed when re-evaluation or additional information is required. This additional testing might include examining deeper levels or the performance of

immunohistochemical stains. Opinions from additional expert pathologists might also be readily obtained.

Implicit in this goal of improved clinicopathological correlation in diagnosis is the need for a good working relationship between the clinician and the pathologist to facilitate communication, allowing resolution of any diagnostic challenges.

Aside from the immediate feedback provided to the clinician by the histology report, the pathology laboratory can also assist with audit activity. Collation of clinical diagnosis and matching pathological diagnosis can assist the clinicians to compare performance with their peers.

Conclusion

In summary, we have highlighted the two most important challenges in the pathological assessment of skin cancer cases, namely adequacy of information and the skin cancer specimen. These issues have been canvassed in the dermatological and surgical literature but might be less well known to GPs. Increasing awareness of these issues provides an avenue for more effective management of skin cancer and improved practice.

Key points

- Australia has the highest incidence of skin cancer globally.
- Inadequate clinical information in pathology requests can lead to diagnostic challenges.
- Quality of skin cancer specimens significantly impacts the accuracy of pathological assessments.
- Collaboration between GPs and pathologists is crucial for accurate diagnosis and treatment.
- Awareness of issues in pathological assessment can lead to more effective skin cancer management.

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