

6 Biopsy

The following is a discussion of the different forms of biopsy appropriate for suspicious pigmented lesions.

6.1 Complete excisional biopsies

The ideal method for skin lesions suspected of being melanoma is complete excision with a 2mm margin.¹ The National Comprehensive Cancer Network advises that the margin of normal skin should be no larger than 3mm to avoid interfering with subsequent lymphatic mapping² and Roberts et al 2002 suggest a margin of 2 to 5mm.³ The ellipse specimen should follow the lines of relaxed skin tension with the deep margin in subcutis. Focally suspicious areas can be indicated on a diagram or marked for sectioning by the pathologist e.g. with ink, suture, superficial or punch incision. Primary closure is the preferred method of closure following excisional biopsy and skin flaps or grafts should be avoided because these may compromise the definitive re-excision.

A retrospective analysis of 298 naevi which showed significantly different degrees of atypia in different zones of 36% of cases concluded that complete excisional sampling of atypical naevi is necessary.⁴

6.2 Partial biopsies

Partial biopsies of suspicious pigmented lesions have been shown to be less accurate (as measured by Breslow thickness) than subsequent wide local excision of suspicious melanocytic lesions or melanoma.⁵ A retrospective review of 114 cases of lentigo maligna (with or without invasion) showed a higher risk of misdiagnosis with partial biopsy compared with excisional biopsy.⁶ Farrahi et al and Karimipour et al found that 21% of 1783 melanoma patients undergoing various techniques of partial biopsy were upstaged on subsequent excisional samples (which showed significantly higher Breslow thickness).⁷ They concluded that the smaller the percentage of lesion removed by biopsy, the greater the degree of inaccuracy was likely to occur. In a series of 46 partially biopsied pigmented lesions from actinically damaged skin, 40% of re-excisions revealed deeper invasion or diagnostic changes not seen on original biopsy, with 28% of these felt to be of prognostic or therapeutic significance. In 20% of cases, the initial biopsy did not identify invasion that was later seen on the excision sample.⁸

At times, complete excision is not practical for clinical, technical or other reasons, so partial biopsy may be necessary. This may be considered where the lesion is large or on a site where total excision may cause cosmetic or functional impairment, when there is a low index of clinical suspicion or significant comorbidities. All biopsies should include the most suspicious or invasive zones. The biopsy type and proportion of the lesion sampled should be indicated on the pathology request form. Careful planning of the biopsy site is essential and use of dermoscopy may be helpful in targeting the most suspicious area. It may be appropriate to indicate in the pathology report that a partial biopsy may not be fully representative of the lesion.

Partial biopsies are an important cause of litigation in the US because of inadequate material being available for analysis by the pathologist.⁹ They should only be performed by appropriately trained clinicians aware of the possible limitations of the technique. Evaluation of the subsequent excision specimen may be impaired by reparative changes, and accurate determination of Breslow thickness, regression or lymphocytic infiltration may be compromised.

A **punch biopsy** provides dermis for assessment of tumour invasion but samples only a limited breadth of large lesions and is therefore prone to sampling error. Multiple punch biopsies may minimise this source of error.

A **broad superficial shave biopsy (or curettage)** can provide a larger area of epidermis for histology, but often fails to include sufficient dermis for full assessment of invasion. These biopsies are therefore only suitable for lesions that are likely to be confined to the epidermis (e.g. when attempting to differentiate in situ melanoma from solar lentigo or seborrheic keratosis). In order to maintain the integrity of the epidermis on the sample, at least papillary dermis must be present across the shave. Superficial shave biopsies heal with little or no scar and are therefore suitable for use on the face.

Deep shave biopsies (saucerisation) include varying amounts of reticular dermis and may transect the base of a melanoma, impairing the assessment of Breslow thickness more often than with excisional biopsy. Any form of shave biopsy may incompletely sample the periphery of the lesion and samples can be difficult to orientate in the laboratory. Deep shave biopsies heal with a scar.

Incisional biopsy removing as much of the lesion as is feasible with primary closure can be a very useful method of partial biopsy.

In a retrospective analysis, excisional biopsy demonstrated better diagnostic accuracy than punch or shave biopsies, with deep shave (at least to mid dermis) favoured over punch biopsy.¹⁰ In a study of dysplastic naevi (some of which were later diagnosed as melanoma on histology), 21 of 22 shave biopsies and 29 of 41 punch biopsies were concordant with the subsequent excision.¹¹ It should be noted that the type of shave used in this study was of the 'saucerisation' type, a style of shave biopsy that is not commonly used in many centres. A retrospective review of 223 cases of melanoma showed that shave samples generally gave the thinnest samples compared with punch or excisional biopsies, and that 50% of these shave biopsies showed at least one positive margin.¹² In Karimipour et al 2005, shave biopsy was less accurate in determining Breslow thickness.⁷

In a multicentre RCT of 2164 melanoma patients, Martin et al found that prognosis was not affected by previous incisional biopsy of the lesion.¹³ A comparison of 265 melanomas sampled by incisional biopsy with 496 control melanomas not subjected to incisional biopsy did not show effects on prognosis, or on risk of recurrence.¹⁴

It is important to consider the weaknesses of partial biopsies when interpreting the pathologist's report. If the result does not accord with the clinical impression or there is diagnostic uncertainty, a better sample should be obtained, preferably by performing a complete excision.

The theoretical risk of melanoma dissemination by biopsy prior to excision has generally been rejected.

6.3 Alternative approaches

Frozen section and cytological analysis are inappropriate for suspicious pigmented lesions, but may be of value when assessing potential metastases from a melanoma, for example, in a lymph node.

When clinical suspicion of malignancy is low, observation may be appropriate, possibly backed up by dermoscopy, clinical photographs and an accurate description and measurement of the lesion. Referral to a specialist should be considered before biopsy for lesions in technically difficult anatomical locations (e.g. the eyelid) or where the operator is not confident in achieving an adequate sample or good cosmetic result.

Where clinical suspicion remains despite a negative pathology report following a partial biopsy, rebiopsy or excision should be performed. Even after complete excision, if the pathology result does not correlate with the clinical impression, discussion of the case with the pathologist is recommended. Review of the slides by a second pathologist may be appropriate in some circumstances.

Evidence summary	Level	Reference
Partial biopsies versus completeness of excision Complete excision with a 2mm margin is the most reliable biopsy method for skin lesions suspected of being melanoma	IV	1, 3
One-third of atypical naevi show significantly different degrees of atypia in different zones indicating that complete excisional sampling of atypical naevi is necessary	III-3	4
Partial biopsy has been shown to be less accurate (as measured by Breslow thickness) than the subsequent wide local excision of suspicious melanocytic lesions or melanoma	III-3	5
Partial biopsies are an important cause of litigation because of inadequate material being available for analysis by the pathologist	IV	9
A retrospective review of 114 cases of lentigo maligna (with or without invasion) showed a higher risk of misdiagnosis with partial biopsy compared with excisional biopsy. In another study, 21% of partial biopsies were upstaged on subsequent excisional samples (which showed significantly higher Breslow thickness), with greater inaccuracy related to smaller percentages of lesion removed by biopsy	III-3	6, 7
In a series of 46 partially biopsied pigmented lesions from actinically damaged skin, 40% of re-excisions revealed deeper invasion or diagnostic changes not seen on original biopsy, with 28% of these felt to be of prognostic or therapeutic significance. In 20% of cases, the initial biopsy did not identify invasion that was later seen on the excision sample	III-3	8

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Evidence summary continued...	Level	Reference
Partial biopsies are an important cause of litigation because of inadequate material being available for analysis by the pathologist	IV	9
<p>Types of biopsies (punch, shave, incisional)</p> <p>Excisional biopsy demonstrated better diagnostic accuracy than punch or shave biopsies. In a study of dysplastic naevi (some of which were later diagnosed as melanoma on histology), 21 of 22 shave biopsies and 29 of 41 punch biopsies were concordant with the subsequent excision. In a retrospective review, shave samples generally gave the thinnest samples compared with punch or excisional biopsies, and 50% of these shave biopsies showed at least one positive margin. In another study, shave biopsy was less accurate in determining Breslow thickness</p>	III–3	
In a multicentre RCT, prognosis was not affected by previous incisional biopsy of the lesion	II	13
A comparison of melanomas sampled by incisional biopsy compared with melanomas not subjected to incisional biopsy did not show differences between prognosis, or on risk of recurrence	III–3	14

Recommendations

	Grade
1. The optimal biopsy approach is complete excision with a 2mm margin and upper subcutis	C
2. Partial biopsies may not be fully representative of the lesion and need to be interpreted in light of the clinical findings	C
3. Incisional, punch or shave biopsies may be appropriate in carefully selected clinical circumstances, for example, for large facial or acral lesions, or where the suspicion of melanoma is low	C

6.4 Good practice point

- It is advisable to review unexpected pathology results with the reporting pathologist

References

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