

Missed Pathology Follow-Up Leading to Delayed Melanoma Diagnosis

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Abstract

Missed pathology follow-up is a preventable cause of delayed melanoma diagnosis and can be compounded by cognitive biases. We report two cases in which failure to review pathology results led to delayed recognition of nodular melanoma. Both cases highlight the interplay between system failures and anchoring bias. Strengthening result verification processes, incorporating electronic alerts for unreviewed reports indicating malignancy, and promoting patient access to results are essential to preventing similar diagnostic delays.

Keywords: Delayed diagnosis, malignant melanoma, metastasis, vitiligo-like depigmentation

INTRODUCTION

Cognitive errors remain an important contributor to delayed melanoma diagnosis. Failure to verify or follow-up on pathology results, combined with anchoring to benign or trauma-related explanations, can delay recognition of malignancy. We present two cases illustrating unfavourable outcomes resulting from missed pathology follow-up for nodular melanoma.

The authors obtained consent from all patients for the publication of recognizable photographs, with the understanding that these photographs may be publicly available.

CASE REPORT

Case 1: A 72-year-old man underwent excision of a nodular subcutaneous lesion on his left shoulder in 2020. Pathology was reported as nodular melanoma (Breslow thickness 5.5 mm, Clark level IV, 10 mitoses/mm², and ulceration),

corresponding to pT4b disease. Neither regression nor evidence of lymphovascular or perineural invasion was identified. Immunohistochemical (IHC) analysis showed diffuse positivity for S-100 and HMB-45. The Ki-67 proliferation index was elevated, but the patient never received the report. He remained asymptomatic for five years until he presented with newly developed vitiligo-like depigmented macules on his face and an approximately 5-cm firm mass in his left axilla (Figure 1a). Positron emission tomography/computed tomography (PET/CT) demonstrated metabolically active metastatic involvement of the left axillary lymph nodes, without evidence of distant metastasis. The patient underwent surgical excision of the involved nodal mass and was subsequently referred for oncologic management and close multidisciplinary follow-up.

Case 2: A 29-year-old man presented in 2023 with a bleeding lesion on his right forearm following minor trauma. It was clinically interpreted as a pyogenic granuloma by a plastic surgeon and was completely excised. Pathology was reported

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as nodular malignant melanoma (Breslow thickness 5 mm; Clark level IV; 5 mitoses/mm²; no ulceration; no regression; no evidence of lymphovascular or perineural invasion), corresponding to pT4a disease. IHC analysis demonstrated strong diffuse positivity for HMB-45, SOX10, and PRAME. The Ki-67 proliferation index was 20%. It was uploaded to the national e-health system but never reviewed by either the clinician or the patient. Two years later, halo nevi and patchy beard leukotrichia developed, prompting dermatologic reassessment (Figure 1b). Review of the national health records at that time revealed the prior malignant pathology. PET/CT showed no metastatic disease; therefore, no additional treatment was administered. The patient has been followed at 3-month intervals for one year, with no evidence of local recurrence, regional or distant metastases, or a new primary melanoma.

DISCUSSION

Both cases highlight critical diagnostic vulnerabilities arising from failures in pathology follow-up and cognitive biases. In the first case, the unreviewed melanoma report is a classic example of a high-impact error at the system-communication interface in which the absence of structured verification ultimately delayed oncologic evaluation and may have influenced prognosis. In the second case, specifically anchoring bias, the premature acceptance of a trauma-related benign explanation hindered reconsideration of melanoma

and demonstrated how immune-mediated depigmentation can serve as a delayed but crucial clinical clue to an overlooked melanoma diagnosis.¹⁻³

A shared underlying issue in both cases was the absence of direct, mandatory communication and confirmation of pathology results. Complete reliance on electronic systems, without concurrent clinician and patient verification, allowed critical malignant diagnoses to go unnoticed. Cognitive contributors included premature closure and failure to consider alternative diagnoses once an initially benign interpretation was accepted.

To prevent recurrence of similar errors, structured communication and verification pathways must be prioritized.^{4,5} The proposed patient safety interventions can be operationalized within three complementary domains. First, closed-loop verification systems should require the responsible clinician to acknowledge pathology reports and to document appropriate follow-up actions (e.g., referral, repeat excision, or surveillance). Second, high-risk results, such as malignant melanoma, should be automatically triaged and escalated within electronic health record systems, triggering alerts to clinicians and designated oversight teams when reports remain unreviewed. Third, patient-facing access to pathology results through national e-health platforms, combined with targeted patient education on the importance of result review and follow-up, may provide an additional safeguard against missed diagnoses.



Figure 1. Clinical presentations of the patients. (a) Vitiligo-like depigmented macules on the face of Case 1, five years after excision of a nodular melanoma on the left shoulder. (b) Patchy beard leukotrichia in Case 2, two years after excision of a forearm lesion initially misdiagnosed as pyogenic granuloma

CONCLUSION

These cases exemplify how overlooked diagnostic data and anchoring bias can delay melanoma recognition. Reinforcing communication loops among pathologists, clinicians, and patients is essential to prevent the recurrence of such errors and to enhance patient safety. Strengthening national digital health infrastructures with automated alert systems for unreviewed malignant reports, mandatory acknowledgment mechanisms, and seamless interoperability between pathology and clinical databases can minimize communication gaps and ensure timely diagnostic follow-up.

Footnotes

Informed Consent: The authors obtained consent from all patients for the publication of recognizable photographs, with the understanding that these photographs may be publicly available.

Authorship Contributions

Surgical and Medical Practices: H.M.E.M., B.N.A., Concept: H.M.E.M., Design: H.M.E.M., Data Collection or Processing: H.M.E.M., M.T.S., B.N.A., Analysis or Interpretation: H.M.E.M., M.T.S., B.N.A., Literature Search: H.M.E.M., M.T.S., Writing: H.M.E.M., M.T.S.

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