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The impact of biopsy technique on upstaging, residual disease, and outcome in cutaneous melanoma

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Margins

Abstract

BACKGROUND: After skin biopsy of malignant melanoma, the findings in the subsequent wide local excision (WLE) sometimes result in upgrading of the T-category. Herein, we examine the influence of biopsy technique on residual disease in melanoma WLE specimens and on upstaging.

METHODS: We performed a retrospective review of data from malignant melanoma patients who underwent sentinel lymph node biopsy between 1997 and 2010.

RESULTS: A total of 609 patients were biopsied by shave (51%), punch (19%), and excision (30%). Residual disease was seen in 240 patients (39%) at WLE, of whom 60% had undergone shave biopsy. Fifty-nine patients had a T-category upgrade after WLE (10% of all patients); 64% were sampled by shave. Seven percent of patients with a T-category upgrade had negative margins initially. Positive biopsy margin and greater thickness predicted T-category upgrade.

CONCLUSIONS: Partial biopsy for melanoma resulted in more residual disease at WLE and a higher rate of T-category upgrade. Moreover, the presence of negative margins at biopsy did not ensure lack of residual disease.

The rate of death caused by melanoma is trending upward.[1] In 2010, melanoma was estimated to have caused 8,700 deaths.[1] It is expected to be the fifth most common cancer in men and the seventh most common cancer in women.[1] Biopsy of a suspicious pigmented lesion is critical and necessary as a first step in the diagnosis of melanoma.[2] The National Comprehensive Cancer Network (NCCN) guidelines advise excisional biopsy with 1- to 3-mm margins of clinically normal tissue to sample the suspicious lesion.[3] Incisional biopsy (shave or punch) may be used if the lesion is large, or on certain sites where excision may be impractical, such as the palm, sole, ear, distal digit, or subungual skin.[3] However, partial biopsies may result in misdiagnosis and inaccurate microstaging.[4] Reports have found a microstaging discrepancy between partial biopsy and excision in 2% to 43% of cases.[4–6] In one study, upstaging owing to increased thickness at definitive excision occurred in 10% of patients with melanoma in whom 50% or more of the lesion remained.[7] Thirty-one percent of dermatologists in the United States and 22% of dermatologists in the United Kingdom use partial biopsies to sample lesions suspi-

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cious for melanoma.[4] This can have significant consequences for the management of the melanoma patient because the biopsy results guide surgical margins, sentinel lymph node (SLN) biopsy, diagnostic tests, and adjuvant therapy.[6] A recent review that included 9 studies found that biopsy technique is not associated with prognosis.[8] Previous analyses of a subset of our dataset also have supported that conclusion.[9]

As a referral institution, we see patients with melanoma whose lesions have been biopsied in a variety of ways. Because of the direct impact that information gleaned from the biopsy has on appropriate care of the patient, we created this study to evaluate our experience. Our objective was to analyze biopsy characteristics with respect to residual disease in the wide local excision (WLE) specimen, upstaging, and survival of patients with melanoma.

Methods

Data were reviewed from malignant melanoma patients who underwent a SLN biopsy and were entered into a prospective database from a single institution, treated from June 1997 to June 2010. One patient was excluded because the original biopsy pathology report was not available. Disease characteristics and clinical outcomes were compared between biopsy methods. Characteristics of the primary melanoma that were analyzed included margins (deep and lateral), Breslow thickness, T-category (≤ 1 mm, 1.01–2 mm, 2.01–4 mm, and > 4 mm), Clark's level, ulceration, mitotic rate, angiolymphatic invasion, and perineural invasion. Residual disease was defined as the presence of invasive melanoma and melanoma in situ present on WLE. Local recurrence was defined as melanoma arising within 2 cm of the original excision. In-transit recurrence was a melanoma metastasis between the original lesion and draining lymph node basin. Disease outcome measures included disease-specific mortality and overall mortality.

Categoric variables were compared between groups using chi-squared tests. Continuous variables were compared between groups using two-sample *t*-tests. Univariate and multivariate logistic regression were used to predict T-cat-

Table 1 Patient, biopsy, margin, final melanoma, and SLN characteristics

		n = 602			
	Totals n = 609	Shave (n = 306 [51%])	Punch (n = 114 [19%])	Excisional (n = 182 [30%])	*P* value
Age, y					<.001
Mean	62	64	61	58	
Range	14–97	18–92	15–88	16–95	
Male	361 (59%)	184 (60%)	52 (46%)	119 (65%)	<.001
Location					<.01
Head and neck	155 (26%)	83 (27%)	28 (25%)	41 (23%)	
Trunk	183 (30%)	91 (30%)	23 (20%)	67 (37%)	
Upper extremity	130 (21%)	71 (23%)	21 (18%)	37 (20%)	
Lower extremity	141 (23%)	61 (20%)	42 (37%)	37 (20%)	
Clinician performing biopsy					<.001
Dermatologist	491 (84%)	275 (91%)	95 (84.8%)	121 (70%)	
Surgeon	32 (6%)	1 (0%)	5 (4.5%)	26 (15%)	
Family practice/PCP	63 (11%)	26 (9%)	12 (10.7%)	25 (15%)	
Biopsy Breslow thickness, mm					<.001
Mean	1.7	1.6	1.6	2.1	
Range	.2–10	.2–8	0–9	0–10	
Margins+					
Any	368 (60%)	248 (81%)	73 (64%)	41 (23%)	<.001
Deep	260 (43%)	209 (68%)	31 (27%)	19 (10%)	<.001
Peripheral	282 (46%)	169 (55%)	70 (61%)	37 (20%)	<.001
Residual disease	240 (39%)	140 (46%)	67 (59%)	28 (15%)	<.001
Final Breslow thickness, mm					.49
Mean	2.0	1.9	2.0	2.1	
Range	.2–30	.5–30	.3–10	.2–10	
T stage					.27
T1	168 (28%)	95 (31.1%)	30 (26%)	43 (24%)	
T2	251 (42%)	123 (40.3%)	47 (41%)	77 (43%)	
T3	129 (21%)	65 (21.3%)	27 (24%)	35 (20%)	
T4	57 (9%)	22 (7.2%)	10 (9%)	24 (13%)	
Ulceration	136/534 (26%)	74 (24%)	25 (22%)	34 (23%)	.71
Mitotic rate >1/mm^2	253/456 (56%)	124 (53%)	54 (59%)	73 (58%)	.46
SLN+	81/605 (13%)	41 (14%)	10 (9%)	27 (15%)	.30

PCP = primary care physician.