

# Primary excision of cutaneous melanoma: does the location of excision matter?

Peter Murchie, Erika Sinclair and Amanda J Lee

## ABSTRACT

Melanoma is diagnosed more quickly if primarily excised in primary care, but current guidelines discourage this. The reports of all melanomas excised in north-east Scotland between 1991 and 2007 were analysed for adequacy of excision. Reports were analysed blinded as to source. Of primary biopsies performed in primary care, 72.5% were reported as completely excised, compared with 69.7% of those performed in secondary care ( $P < 0.612$ ). The difference remained non-significant following adjustment for important confounders.

### Keywords

cancer; melanoma; primary health care; skin neoplasms; surgical procedures, minor.

## INTRODUCTION

The incidence of melanoma in the UK has quadrupled since 1970.<sup>1</sup> By 2025 an estimated 15 500 cases of melanoma will be diagnosed annually.<sup>1</sup> Melanoma is curable if diagnosed and excised early.<sup>1</sup> Existing guidelines discourage primary care excision of suspected melanoma,<sup>2</sup> but evidence is contradictory.<sup>3-7</sup> Furthermore, two studies demonstrate that melanoma is diagnosed more quickly following primary care excision.<sup>7,8</sup> Consequently, definitively elucidating the relative quality of primary versus secondary care excision is very important, since current melanoma guidelines may not support the optimal diagnostic pathway. This is explored in this report, in melanomas diagnosed in north-east Scotland between 1991 and 2007.

## METHOD

### Setting, subjects, and data collection

All melanoma pathology reports, issued from Aberdeen Royal Infirmary between January 1991 and July 2007, were scrutinised by a single observer, blinded to the location of excision and clinician submitting the specimen. They were assessed for: type of biopsy, quality of clinical information provided, accuracy of diagnosis, anatomical site of biopsy, prognostic features, and completeness of excision.

### Statistical analysis

Analyses were conducted using SPSS (version 17.0.0). Only primary excisions of melanoma were included. For patients with more than one primary excision, only the first was included. For differences between groups, categorical data were analysed using the  $\chi^2$  test, patient age with the independent  $t$ -test, and Breslow thickness with the Mann-Whitney  $U$  test. Multivariate analysis of the primary outcome measure (completeness of excision) was conducted using binary logistic regression to explore the independent effect of five potential confounders (patient age and sex, lesion site, speciality of operator, and abstract diagnosis).

*P Murchie*, BSc (Med Sci), MBChB, MSc, PhD, senior lecturer in primary care; *AJ Lee*, BSc, MSc, PhD, professor of medical statistics, Centre of Academic Primary Care, University of Aberdeen, Aberdeen. *E Sinclair*, MBChB, career start general practitioner NHS Grampian, Aberdeen.

### Address for correspondence

Peter Murchie, Centre of Academic Primary Care, University of Aberdeen, Foresterhill Health Centre, Westburn Road, Aberdeen, AB25 2AY. E-mail: p.murchie@abdn.ac.uk

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## How this fits in

Diagnosis of melanoma is achieved more quickly when the initial biopsy is performed in primary care. Despite this, current guidelines do not identify a role for GPs in the histological diagnosis of suspicious skin lesions. The evidence underpinning this view comes, in the main, from secondary-care studies, employing short time frames. These data suggest current guidelines should be reconsidered and a large UK prospective study of melanoma excision should be considered.

### RESULTS

Between January 1991 and July 2007, 1790 samples were reported as melanoma at Aberdeen Royal Infirmary: 1263 (72.2%) reporting primary melanoma and 527 (29.4%) recurrent or metastatic

melanoma, of which only five (1.0%) came from primary care. Between 1991 and 2007 the Information Services Division (ISD) Scotland registered 1156 incident cases (91.7% of the total) from Grampian region, suggesting that the study dataset is complete.<sup>9</sup>

Of 1263 primary melanomas, 262 (20.7%) came from primary care and 1001 (79.3%) from secondary care. For 94 patients having more than one primary melanoma excised, only the first was included. Of 262 primary care biopsies, 103 (39.3%) were from men, compared with 417 (41.7%) of 1001 from secondary care ( $P = 0.492$ ). The mean (standard deviation [SD]) age of patients from primary care was 51.8 (17.1) years, compared with 59.4 years (18.3 years) in secondary care ( $P < 0.001$ ).

Data on operator specialty, anatomical site, biopsy method, and quality of information provision are presented in Table 1.

There were no significant differences between biopsies submitted from primary and secondary care in proportions with or without adverse prognostic features (ulceration, lymphatic/vascular invasion, perineural invasion, and previous intradermal naevus). The Clark level was lower in primary care biopsies ( $P = 0.016$ ). In primary care biopsies the median (interquartile range [IQR]) Breslow thickness was 0.9 mm (0.4–1.85 mm) compared with 1.0 mm (0.4–2.3 mm) for secondary care ( $P = 0.073$ ).

Table 2 compares the completeness of excision of samples received from primary and secondary care. Table 3 shows the results of multiple logistic regression to examine if setting (primary/secondary care) was an independent predictor of excision completeness after adjusting for potential confounders. Following multiple adjustment, the adjusted odds ratio for complete excision in primary care was 1.16 (95% confidence interval [CI] = 0.34 to 3.97,  $P = 0.819$ ).

### DISCUSSION

#### Summary of main findings

About 20% of melanomas were excised in primary care, according with previous UK reports, but much lower than in Australia.<sup>3-8,10</sup> There was no significant difference in Breslow thickness of biopsies excised in either setting, as has been seen before.<sup>4,5,7</sup> As previously reported, GPs in this study were less likely to state the correct diagnosis, which has been interpreted as demonstrating that GPs have poorer diagnostic skills.<sup>3-5</sup> Alternatively, GPs could be excising atypical melanomas that are harder to diagnose, as suggested by a systematic review finding no difference between the diagnostic skills of dermatologists and primary care physicians.<sup>11</sup>

**Table 1. Specialty of operator, anatomical site of biopsy, and biopsy method by setting, n (%).**

	Primary care	Secondary care	P-value
Specialty			<0.001
<i>n</i>	262	1001	
GP	157 (59.9)	6 (0.6)	
GP frequent exciser <sup>a</sup>	93 (35.5)	22 (2.2)	
Plastic surgeon	10 (3.8)	512 (51.1)	
Dermatologist	0 (-)	152 (15.2)	
General surgeon	2 (0.8)	218 (21.8)	
Other hospital specialists	0 (-)	91 (9.1)	
Anatomical site			<0.001
<i>n</i>	248	960	
Head and neck	32 (12.9)	260 (27.1)	
Body	72 (29.0)	225 (23.4)	
Upper limb	61 (24.6)	133 (13.9)	
Groins	0 (-)	23 (2.4)	
Lower limbs	83 (33.5)	319 (33.2)	
Site unknown	14	41	
Biopsy method			0.02
<i>n</i>	262	1001	
Excisional	245 (93.5)	895 (89.4)	
Incisional	2 (0.8)	41 (4.1)	
Punch biopsy	7 (2.7)	45 (4.5)	
Total other <sup>b</sup>	8 (3.1)	20 (2.0)	
Information from abstracts			
<i>n</i>	169	468	
Abstract diagnosis			<0.001
Correct	33 (19.5)	256 (54.7)	
Incorrect	30 (17.8)	54 (11.5)	
Not stated	106 (62.7)	157 (33.5)	
Abstract quality <sup>c</sup>			0.032
Comprehensive	29 (17.2)	50 (10.7)	
Adequate	130 (76.9)	401 (85.7)	
Inadequate	10 (5.9)	17 (3.6)	
Biopsy site			0.215
Stated	160 (94.7)	453 (96.8)	
Not stated	9 (5.3)	15 (3.2)	

<sup>a</sup>GPs who had excised  $\geq 5$  melanomas in study period. <sup>b</sup>Comprises curettage, shave, operative, enucleation, and amputation. <sup>c</sup>Data available only from 29 March 2000 to 5 July 2007.

Furthermore, if GPs excise melanomas with similar quality to secondary care colleagues, differences in diagnostic skill do not matter.

**Strengths and limitations of the study**

The researcher was blinded to the source of the biopsy, thus removing observational bias, which is a major issue in previous studies. Data were gathered by a single observer to limit variability in subjective analysis, although a second researcher with a similar background should perhaps have analysed a sample of reports to ensure inter-rater reliability. The study also limited bias by excluding secondary excisions (that is, wide local excisions).

This was a retrospective observational study and not a randomised comparison. GPs may remove more straightforward lesions creating bias in their favour; however, no differences exist even after adjustment for biopsy site. In contrast, GPs could be referring obviously malignant lesions and removing those with an atypical appearance, accounting for differences in diagnostic accuracy. Therefore, it is likely that lesions in primary care are still being properly excised even if melanoma is not suspected. The data presented are from Grampian region only, so it is not clear if these results apply more widely. Most importantly, there are no data on long-term outcomes and it is not known which patients went on to die or develop recurrences. A further point to note is the wide confidence intervals around the odds ratio for excision completeness, which probably emphasises the relative rarity of melanoma and the size of study that is required to provide definitive answers on excision location.

**Comparison with existing literature**

Previous studies comparing primary and secondary care excision of melanoma are contradictory.<sup>4-7</sup> Three have reported greater likelihood of incomplete melanoma excision in primary care.<sup>4-6</sup> One, however, was based on only 126 biopsies, and another divided data into ‘complete and adequate excision’ and ‘complete and inadequate excision’, without explaining the difference.<sup>4,5</sup> This is important, since the statistical difference disappears when the data are analysed without this non-defined distinction.<sup>5</sup> However, a more recent study, originating in primary care, reported similar results to those of the present study, finding no significant difference in completeness of excision between primary and secondary care doctors.<sup>7</sup> It is noteworthy that, of previous studies, only those conducted by secondary care doctors have found evidence of poorer-quality GP excision, and in none of these

**Table 2. Outcome of biopsy by setting, n (%).**

	Primary care, n = 262	Secondary care, n = 1001	P-value
Completeness of excision			0.612
Completely excised	190 (72.5)	698 (69.7)	
Incompletely excised	52 (19.8)	227 (22.7)	
Not stated	20 (7.6)	76 (7.6)	
Second pathology opinion			0.034
Referred	29 (11.1)	71 (7.1)	
Not referred	233 (88.9)	929 (92.9)	

**Table 3. Multiple logistic regression model of location of excision predicting completeness of excision.**

	Adjusted OR <sup>a</sup> (95% CI)	P-value
Primary care excision (base = secondary care excision)	1.16 (0.34 to 3.97)	0.819
Male sex (base = female)	1.00 (0.64 to 1.56)	0.994
Age (+1 year)	1.02 (1.01 to 1.03)	0.001
Speciality (base = GP)		
GP frequent exciser	1.06 (0.48 to 2.32)	0.884
Plastic surgeon	0.34 (0.09 to 1.28)	0.110
Dermatologist	1.31 (0.32 to 5.34)	0.706
General surgeon	1.07 (0.27 to 4.33)	0.923
Other hospital specialist	0.98 (0.19 to 4.9)	0.976
Correct abstract diagnosis (base = incorrect)	1.06 (0.82 to 1.36)	0.634
Site (base = head and neck)		
Body	0.39 (0.21 to 0.70)	0.002
Upper limb	0.33 (0.16 to 0.67)	0.002
Lower limb	1.98 (0.36 to 8.43)	0.358
Other	0.69 (0.39 to 1.20)	0.189

OR = odds ratio. <sup>a</sup>Adjusted for the potential confounders of sex and age of the patient; the speciality of the doctor submitting the specimen to the pathology laboratory (GP, GP frequent exciser, plastic surgeon, dermatologist, general surgeon, other secondary care specialist); the accuracy of any stated diagnosis; and the biopsy site (head and neck, body, upper limb, lower limb, groin and perineum).

studies do the investigators appear to have been blinded to the site of origin of the report.<sup>3-5</sup>

**Implications for clinical practice and future research**

This study found no evidence to support the belief that melanomas are more likely to be excised inadequately in primary care. In the context of UK policy drives to reduce cancer diagnostic delays, and given that GP excision of melanoma results in more rapid diagnosis, guidelines should be re-examined.<sup>7,8,12</sup> Currently, however, the relative outcomes of patients receiving their primary biopsy in primary or secondary care are unknown, although existing evidence suggests that survival is not compromised by having a melanoma excised in primary care.<sup>6</sup> This, along with a large-scale national prospective study, is a key issue for future researchers to consider.

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### Ethical approval

This was a clinical audit of anonymised data. Ethical approval was not required.

### Competing interests

The authors have stated that there are none.

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