

Melanoma and Pigmented Lesions

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P1801

Dynamic infrared imaging (DIRI®) of pigmented lesions of the skin: A pilot study of a thermal and vascular imaging modality to distinguish malignant from benign lesions

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Dynamic Infrared Imaging (DIRI) is a noninvasive imaging technique that passively records natural Infrared Radiation (IR) emitted from living tissues that has been shown to be able to detect minute temperature changes (0.006 degrees Celsius) and vasomotor changes to a depth of ~ 200 micrometers. We hypothesized that DIRI could detect such tissue surface changes induced by a cutaneous malignancy as compared to the surrounding normal skin. A pilot study was conducted examining twenty patients from our Cutaneous Oncology and Pigmented Lesion Clinics with suspicious skin lesions that warranted biopsy to assess the utility of DIRI in skin lesions. Suspicious skin lesions were scanned with DIRI then biopsied, and DIRI results were compared to the histologic diagnoses. The investigators were blinded throughout the study and all scans were analyzed by Advanced BioPhotonics, Inc. A total of 24 skin lesions were analyzed including 4 melanomas (1 invasive, 1 melanoma in-situ, 2 metastatic), 1 squamous cell in-situ (SCCIS), and 19 benign skin lesions. DIRI correctly identified 4 out of 4 melanomas as malignant, and 15 out of 19 benign lesions as benign, while there were 4 false positive results (benign and atypical nevi) and one false negative result (SCCIS). For all cancers, it had a diagnostic sensitivity of 80 % (95% confidence interval [CI]: 28-100%), and a specificity of 78.9% (95% CI: 54-94%). For melanoma detection, however, it had a sensitivity of 100% (95% CI: 40-100%) and specificity of 80% (95% CI: 56-94%). It is notable that DIRI correctly identified the melanoma in-situ as having an altered thermal and tissue perfusion pattern rendering the malignant interpretation, perhaps suggesting that underlying vasomotor changes are already evident at this early stage of disease. In contrast, other skin tumors such as SCCIS may not have such changes. Scanning technique is being reevaluated to assess the false positive scans, given the extreme sensitivity of the instrument to temperature shifts. In summary, this is the first study using a thermal and vascular imaging modality in the investigation of cutaneous melanoma. The results, though preliminary and from a small sample, warrant further investigation with this novel imaging technique in the screening of pigmented skin lesions for cutaneous melanoma.

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The safety and efficacy of the scoop-shave for pigmented lesions of the skin

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Purpose: The scoop-shave is a biopsy into the deep dermis used for complete removal. Concern over melanoma transection has inhibited many practitioners from using this technique. We hypothesized that when performed appropriately, this technique can be safe and efficacious.

Methods: Pigmented lesions removed from September 2006-June 2007 were included. A survey was completed at the time of the procedure, which included the technique used, intent and diagnosis. Patients rated their experience (on a scale of 1-5) within 2 weeks of the procedure.

Results: 333 lesions were removed. Diagnoses included dysplastic nevi, other nevi, melanomas (invasive and in situ) and other lesions. Of the dysplastic nevi, 62.2% were completely removed by scoop shave. Of the melanomas, 35.3% were completely removed by scoop-shave, compared to 64.7% by standard excision. Of the 204 total lesions that were completely excised, 48% were by scoop-shave ($p < 0.0001$). 13 in-situ melanomas were identified. All had adequate depth but 8 (61.5%) had positive peripheral margins, 50% of which were scoop-shaved. 16 invasive melanomas were identified, and 33.1% were scoop-shaved. All had adequate depth but 25% had positive margins and 2 were scoop-shaved. Of the 88 dysplastic nevi removed in this study, 56.8% were scoop-shaved. Two cases showed positive deep margins: one moderately dysplastic nevus (scoop-shaved) and one intradermal nevus (shaved). 208 patients were contacted within 2 weeks of the procedure, and 85% were satisfied (>3 on 5 point scale) with their experience. Of the satisfied patients, 38.6% had a scoop shave. Of the 32 patients who were unsatisfied, 69% had scoop shaves ($p = 0.003$).

Conclusion: The scoop-shave is an effective technique for diagnosis and treatment of melanocytic lesions. Most patients were satisfied regardless of method used. Of the unsatisfied patients, there was a higher proportion who underwent scoop-shave. Perhaps lesion location might be considered prior to using this technique.

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Assessment and development of educational tools for the detection of signs of melanoma within ethnic skin populations

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Background: The incidence of melanoma is highest amongst Caucasians; however minorities experience disproportionately higher mortality rates. Despite this health disparity, there is an unmet need for a public educational effort directed towards melanoma in ethnic skin populations.

Objective: To determine methods for enhancing the relevance of melanoma educational materials for ethnic minorities.

Methods: Single self-reported ethnicity focus groups were conducted for each of the following groups: African American/Black, Hispanic/Latino, and Asian/Pacific Islander. Subjects recruited from the general community in Chicago participated in a 2 hour discussion group on their understanding of melanoma and skin cancer. Subjects also read and commented on sections of an educational brochure by the American Cancer Society (ACS) titled, "Why You Should Know about Melanoma" and reacted to clinical photographs of melanoma on ethnic skin. Additionally, subjects completed surveys assessing their perception of skin color and risk for developing melanoma. The audiotapes of the focus groups were transcribed and the data loaded into NUDIST-QSR software for thematic analysis.

Results: A total of 19 subjects participated in one of four focus groups. Of these, 7 (37%) were African American/Black, 7 (37%) were Hispanic/Latino and 5 (26%) were Asian/Pacific Islander. Manual and computer-based evaluation of the audiotapes and transcripts revealed several recurrent themes. First, subjects did not recognize the term "melanoma" as a relevant health concern. Second, there was a lack of awareness regarding the common acral presentation of melanoma amongst ethnic skin populations. Third, subjects reported that they were more likely to consult a primary care physician than a dermatologist on matters pertaining to skin health and preferred receiving melanoma education in the primary care setting.

Conclusion: Melanoma educational materials directed towards ethnic skin populations should first specify that melanoma is a form of skin cancer; second, include photographs of early recognizable stages of acral melanoma on ethnic skin and provide guidance on how to particularly inspect hands and feet for suspicious moles. Finally, educational materials would be best received by ethnic skin populations if distributed in a primary care setting.

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Animal-type melanoma in an African American woman

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An 89 year-old African-American woman presented for a black nodule over the back that was growing in size for a period of 6 months. There was no history of bleeding or ulceration of the lesion. An excisional biopsy was done. On tissue examination, sheets of heavily pigmented polygonal, rounded and spindled-shaped melanocytes filling the dermis and extending to the subcutaneous fat were seen. The tumor cell cytoplasm contained fine to coarse melanin granules that obscured the nuclear morphology and necessitated bleaching of the slide. Examination of the bleached slide revealed pleomorphic nuclei with coarse chromatin and prominent nucleoli. Mitoses were rare. The pathological picture was diagnostic of a malignant melanoma, animal type.

Animal-type melanoma is a rare variant of melanoma that shows histologic overlap with malignant blue nevus. This term was coined to emphasize the similarity of these tumors to melanocytic lesions occurring preferentially over the perineal area or the underside of the tail in gray horses. The tumor has no predilection for age, sex or site. There are very few cases of such tumors reported in African American individuals. Mihm and colleagues reported the first series of six cases in 1999 of animal type melanoma and introduced the definition of melanoma with prominent pigment synthesis. Later on, Zembowicz, Carney and Mihm published a large series of 41 cases of melanocytic neoplasms that are indistinguishable of animal-type melanoma and epithelioid blue nevus of the Carney complex. The authors proposed the term "pigmented epithelioid melanocytoma" for both types of lesions. In the literature, the prognosis of animal type melanoma is controversial. Milette and Ackerman do not consider animal-type melanoma as a distinct variant of melanoma and describes its prognosis as unpredictable or unclear due to the limited evaluation of cases previously reported. In most series, the 2 year or 5 year survival rate is more than 90%.

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Prognosis of transected melanomas found to have no tumor on re-excision

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Introduction: Melanoma is the most common fatal skin cancer. The prognosis and therapy of melanoma is directly related to the depth of cutaneous invasion at initial removal. This is referred to as "Breslow's depth" and is measured in millimeters (mm). When melanomas are transected at diagnosis, true Breslow's depth is difficult to ascertain. If residual melanoma is present on re-excision, the Breslow's depth of the residual tumor is added to that of the original transected tumor. If no residual melanoma is present on re-excision, only the depth of the transected tumor (original Breslow's depth) is available to guide prognosis and therapy. The purpose of this study is to better define prognosis for this group by comparing survival rates of patients with transected melanomas that have no additional tumor on re-excision with that of melanomas of the same Breslow's depth that are not transected.

Methods: This is a cohort study of patients diagnosed with melanoma at University Hospitals Case Medical Center (UHCMC) between 1996 and 2007 who had corresponding survival data available from the UHCMC Tumor Registry. The study was conducted at an academic medical center with a multidisciplinary melanoma clinic that draws patients from the surrounding community. The study examined the number of transected melanomas, the proportion of transected melanomas without residual tumor, risk factors for poor survival, and relative survival rates of transected tumors found to have no residual tumor compared with non-transected tumors of similar Breslow's depth. Univariate and multivariate survival analyses used the Kaplan-Meier method and Cox-proportional hazards model. The significance level was set at 0.05.

Results: A total of 625 patients were included for analysis. The study found that 178 of 625 (28.5%) melanomas were transected at diagnosis. Of the transected melanomas, 59.0% revealed no residual tumor on re-excision. In the multivariate analysis, advanced age ($p=0.0011$), higher Breslow's thickness ($p=0.0032$), and presence of ulceration ($p=0.0112$) each independently predicted poorer survival, while male sex (0.0981) and positive sentinel node (SN) status (0.0666) trended toward poorer survival. Univariate analysis demonstrated that patients with transected melanomas with no residual tumor had poorer survival than patients with no transection ($p=0.0479$). The multivariate analysis trended toward this result as well ($p=0.0887$).

Conclusions: A high number of melanomas are transected at diagnosis, making appropriate staging and therapy difficult. In agreement with other studies in the literature, factors found to predict poorer survival include advanced age, thicker Breslow's thickness, presence of ulceration, male sex, and positive SN status. Patients with transected melanomas with no residual tumor on re-excision may have poorer survival, and as a result, more aggressive diagnostic and therapeutic procedures may be appropriate for them.

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