Reduction in nevus biopsies in patients monitored by total body photography

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Background: Total body photography (TBP) can facilitate identification of new and changing lesions. By confirming that particular nevi are stable, TBP may reduce nevus biopsies.

Objectives: We sought to determine the number and rate of nevus biopsies before and after TBP, and the factors associated with increased biopsy rate during monitoring by TBP.

Methods: We reviewed records of all patients in 2 pigmented lesion clinics (PLCs) who received TBP and had 2 or more follow-up visits over a period of 2 years or longer.

Results: Before PLCs and TBP, the mean number of nevus biopsies per patient was 5.92 (589 patients) at a mean rate of 1.62 per year (160 patients). After TBP in PLCs, the same patients averaged 1.56 biopsies at a mean rate of 0.34 per year ($P < 2 \times 10^{-16}$). The entire cohort (926 patients) averaged similarly low post-TBP biopsy rates of less than 0.2 per year and per visit. Biopsy rates after TBP were positively correlated with decreased age, male gender, and family history of melanoma, but not nevus number.

Limitations: Some information was not available for some patients.

Conclusions: Patients at risk for melanoma experienced a 3.8-fold reduction in nevus biopsies after TBP. Younger male patients with family history of melanoma had higher biopsy rates after TBP. (J Am Acad Dermatol 2016;75:135-43.)

Key words: biopsy; melanoma; nevus; pigmented lesion clinic; total body photography.

The goals of melanoma screening are to detect and biopsy melanomas early, monitor nevi (but not melanomas), and minimize nevus biopsies.[1] The nevus/melanoma ratio is often used as an indicator of melanoma detection efficiency, but these ratios have been reported over a large range among multiple studies[2-6] and are likely to vary with patient risk and physician expertise.[6,7] The optimal nevus/melanoma ratio is unclear: if the ratio is too low, it is likely that some melanomas are being missed and if the ratio is too high it is likely that too many nevi are being biopsied. In addition to the financial cost of unnecessary procedures, patients often experience anxiety and downtime from multiple procedures and

Abbreviations used:

DN:	dysplastic nevus
MIS:	melanoma in situ
PLC:	pigmented lesion clinic
SLC:	Salt Lake City
TBP:	total body photography

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Ms Truong and Ms Strazzulla made equal contributions, as did Drs Kim and Grossman.

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experience morbidity from multiple scars. These problems may be amplified when in some cases nevus biopsy specimens showing histologic atypia and/or positive margins prompt therapeutic re-excisions of uncertain clinical benefit.[8]

The use of photographic monitoring may improve biopsy efficiency.[9-15] Although digital dermoscopic monitoring is usually only applied to a subset of individual lesions,[16] total body photography (TBP) is intended to monitor all existing melanocytic lesions on a patient.[17] Although young patients often develop new nevi,[1] most nevi—including clinically atypical nevi—are usually stable and unlikely to exhibit suspicious changes over time.[18,19] Thus, use of TBP may minimize nevus biopsies if lack of suspicious change can be confirmed. On the other hand, it is also possible that using TBP may increase the biopsy rate if subtle interval changes in particular lesions are highlighted by photographic comparison. Although TBP may reduce patient anxiety,[20] academic dermatologists are somewhat conflicted regarding the efficacy of TBP.[17] A prior study from our (D. G.) pigmented lesion clinic (PLC) suggested that TBP was associated with lower biopsy rates than digital dermoscopic monitoring in similar patient populations during a 5-year period.[21] On the other hand, Risser et al[22] found that TBP did not affect the biopsy rate in a small group of patients from PLC during a 1-year period. We hypothesized that investigating TBP in a larger group of high-risk PLC patients for longer time periods would demonstrate a reduction in nevus biopsies.

We sought to compare the number and rate of nevus biopsies and rates in our patients at high risk before and after TBP, and to determine the factors associated with increased biopsy rate during monitoring by TBP.

CAPSULE SUMMARY

- Total body photography may reduce unnecessary nevus biopsies.
- We determined the number and rate of nevus biopsies in patients before and after total body photography.
- Patients monitored by total body photography experienced a 3.8-fold reduction in nevus biopsies. Younger male patients with a family history of melanoma had higher biopsy rates.

METHODS

Patients

This study (BIPAP: biopsies in patients after photography) was approved by institutional review boards at University of Utah (no. 73327) and Harvard Cancer Center (no. 14-549). We identified 2169 patients in the Huntsman Cancer Institute mole mapping database (Salt Lake City [SLC], UT) and 486 patients in the PLC database at Beth Israel Deaconess Medical Center (Boston, MA). Patients who did not receive TBP or were younger than 18 years on May 15, 2012, were excluded. We further excluded patients who had less than 2 follow-up visits or a most recent follow-up visit that was less than 2 years after receiving TBP. The demographics and melanoma risk factors of 926 patients (626 from SLC, 300 from Boston) who met inclusion criteria are presented in Supplementary Table I (available at http://www.jaad.org), which shows the presence of multiple melanoma risk factors in both PLC cohorts. Many patients had clinically atypical nevi, but these were not documented for individual patients.

Chart review

Electronic health records of patients were reviewed. Information on number of pre-PLC nevus biopsies was available for 589 patients (SLC and Boston), whereas rate of pre-PLC nevus biopsies was available for only 160 patients from Boston. For patients who did not have pathology reports available for all pre-PLC biopsies, number of pre-PLC nevus biopsies and timelines were obtained by patient report. Almost all patients from SLC had TBP on the same day (immediately after) the initial PLC visit, thus for these patients PLC pre-TBP data were from this initial PLC visit and all subsequent PLC visits were considered post-TBP. Some patients from Boston had several PLC visits before TBP, thus for these patients PLC pre-TBP data were pooled from the PLC visits occurring before TBP and all subsequent PLC visits were considered post-TBP. Follow-up length was determined from date of TBP to most recent visit (up to May 15, 2014). Only follow-up visits and biopsies where use of photographs was documented were included. The different patient cohorts are summarized in Table I.

All melanocytic lesions were included, and non-melanocytic lesions and therapeutic re-excisions were excluded. Pathology results were classified as common nevus (eg, non-dysplastic nevi [DN], blue nevi), DN (mild, moderate, or severe), melanoma in situ (MIS), or invasive melanoma. A diagnosis of "evolving MIS" was classified as MIS. Nevi with "architectural disorder" but no cytologic atypia were classified as mild DN. Nevi with "atypical melanocytic proliferation" were classified as severe DN. If 2 histologic degrees of atypia were mentioned (ie, mild-moderate), the more severe degree was used.