

# Sentinel Lymph Node Biopsy in Patients With Diagnostically Controversial Spitzoid Melanocytic Tumors

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Melanomas can be difficult to diagnose histologically if they deviate in their growth pattern or cytology only minimally from a nevus. On occasion, even experts on melanocytic lesions may not reach a consensus on whether a lesion is a benign but unusual nevus or a malignant melanoma mimicking a nevus. This diagnostic dilemma is particularly well known for the distinction of Spitz nevus from melanoma. Diagnostic uncertainty and disagreement among consultant pathologists lead to confusion about the prognosis and clinical management of patients. In this study we present the clinical and pathologic findings of 10 patients with diagnostically controversial melanocytic tumors, who underwent sentinel lymph node biopsy. In all of these cases, the diagnostic controversy among experts was between Spitz nevus and melanoma. Seven patients were female, and three were male, ranging in age from 7 to 46 years (mean 21 years). Histologic examination of the sentinel lymph nodes revealed tumor deposits in the lymph node parenchyma in 5 of 10 patients. Among patients with positive sentinel lymph nodes, two had satellite nodules and one showed additional tumor deposits in three nonsentinel regional lymph nodes. All patients are alive and free of disease with a follow-up of 10–54 months (mean 34 months). Our study illustrates the role of a sentinel lymph node biopsy in the evaluation of patients with diagnostically controversial melanocytic tumors. Although the presence of metastatic tumor deposits in the sentinel lymph node supports the diagnosis of malignant melanoma, further studies are needed to determine the prognostic significance of the sentinel lymph node findings in such patients.

**Key Words:** Sentinel lymph node—Spitz nevus—Melanoma.

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Since Sophie Spitz reported a series of “melanomas in childhood” and discussed the difficulty of distinguishing

these tumors from conventional adult-type melanomas,<sup>45</sup> the diagnosis of Spitz nevi and melanomas mimicking Spitz nevi has remained one of the more contentious issues in dermatopathology.<sup>13,22,43</sup> Spitz nevi are defined by a number of histologic features, which have evolved over the past decades.<sup>1–3,10,13,22,35,47,48</sup> The typical compound Spitz nevus is by silhouette a symmetric dome-shaped lesion composed of large spindle and epithelioid melanocytes with eosinophilic cytoplasm. If the dermal melanocytes show features of maturation and lack marked pleomorphism and mitotic figures, the lesion is readily recognized as a benign nevus.<sup>1–3,10,13,22,35,47,48</sup> Clefts between melanocytes and neighboring cells, and/or large dull pink globules at the dermoepidermal junction provide additional supportive evidence for a diagnosis of Spitz nevus.

However, there are atypical melanocytic tumors with features of a Spitz nevus, which deviate in growth pattern and/or cytology from a benign nevus.<sup>5</sup> Such lesions may contain many mitoses, expansile dermal nests, minimal maturation, marked pleomorphism, and other features, which are of concern for melanoma. Because they differ in appearance from “conventional” adult-type melanomas and tend to occur in young patients, pathologists usually hesitate to render a diagnosis of malignant melanoma.

Various terms have been proposed to separate such diagnostically difficult melanocytic lesions from conventional melanomas, including “minimal deviation melanoma, Spitz nevus-type,” “borderline nevomelanocytic neoplasm,” “nevroid melanoma,” and “atypical Spitz nevus/tumor,”<sup>5,27,28,30,35–38,43,46,51,52</sup> with no consensus on the most suitable term.<sup>37</sup> In this study we refer to the lesions in question pragmatically as “diagnostically controversial Spitzoid melanocytic tumors” (DCSMT). They represent a morphologically heterogeneous group of melanocytic tumors but have in common the fact that expert pathologists reviewing their histology discuss the dis-

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inction between Spitz nevus and melanoma and disagree on the final diagnosis.

A recent study by the North America Melanoma Pathology Study Group revealed considerable lack of consensus among pathologists in the diagnosis of so-called "atypical Spitz tumors."<sup>5</sup> Some of the tumors, judged as benign by many experts, proved to be malignant by clinical outcome. Likewise, when patients or clinicians obtain multiple professional opinions on DCSMT from various pathologists, there is often a lack of consensus as well, leading to confusion of patients and their physicians. As long as some pathologists, however, express concern about a lesion's potential malignant behavior and suggest the possibility of melanoma, most patients and their physicians decide to have a diagnostically difficult lesion completely excised.

For many solid tumor types, including melanoma, lymph node status has become the most important prognostic indicator for patients despite the fact that there is principal limitation on its prognostic accuracy. Tumors capable of early hematogenous spread may bypass lymph nodes en route to distant sites, thereby escaping detection by lymph node analysis. Until a few years ago, pathologic staging of regional lymph nodes was not performed routinely in an attempt to avoid lymph node dissection with its risk for complications, such as lymphedema and paresthesias.<sup>26,29</sup> With the advent of lymphatic mapping and sentinel lymph node (SLN) biopsies, early metastases through the lymphatic route can now be detected with minimal morbidity.<sup>12,16,26,29</sup>

Given the low morbidity of SLN biopsy, it has been proposed that SLN biopsies may aid in the evaluation of patients with diagnostically difficult melanocytic tumors.<sup>20</sup> We had previously reported a positive SLN in a child with a melanoma,<sup>9</sup> which had been interpreted by several dermatopathologists as Spitz nevus or atypical Spitz nevus. In this series we present our experience with nine additional patients with DCSMT or melanomas of uncertain malignant potential.

## MATERIALS AND METHODS

Cases were retrieved from the files of the Department of Pathology at Memorial Sloan-Kettering Cancer Center (MSKCC). Only those with outside reports by a board-certified dermatopathologist designating a given pigmented lesion of the skin as "atypical Spitz nevus," "Spitz nevus with severe atypia," "atypical Spitz tumor," or "Spitzoid melanocytic tumor of uncertain malignant potential" were included. Upon review at MSKCC, eight cases were judged by at least one pathologist to be variants of malignant melanomas. Two cases were thought to be uncertain in their malignant potential, and melanoma could not be excluded. Only patients whose tumors mea-

sured at least 1 mm in thickness and/or extended into the reticular dermis underwent SLN biopsies.

All patients were treated with wide local excision. Seven patients had their SLN biopsy done at MSKCC in the manner previously described.<sup>9,12</sup> Three patients underwent SLN biopsies at outside hospitals. Their pathology material (hematoxylin and eosin-stained slides as well as immunohistochemical studies and tissue blocks in selected cases) was reviewed. Follow-up was obtained from the medical records at MSKCC, outside medical records, or by contacting the physicians of respective patients.

Immunohistochemical studies were performed on the SLNs of all seven patients, who were biopsied at MSKCC. The antibodies used in this study included S-100 protein (1:10,000; Dako, Carpinteria, CA, USA), HMB-45 (anti-gp100; 1:200; Dako), or A103 (anti-Melan-A; 1:50; Dako). Detection of the primary antibody was performed with a biotinylated horse anti-mouse secondary reagent (Vector, Burlingame, CA, USA) followed by an avidin-biotin complex system (Vector) using diaminobenzidine tetrahydrochloride (DAB, Biogenix, San Ramon, CA, USA) as a chromogen as previously described.<sup>11</sup>

The statistical analysis was done using SAS (Statistical Analysis System) with t test for continuous variables (Breslow thickness and number of mitoses) and  $\chi^2$  analysis for categorical variables (presence or absence of a histologic parameter, such as Kamino bodies or satellite nodule).

## RESULTS

### Clinical Findings

The clinical findings are summarized in Table 1. Seven patients were female, and three were male. Their ages at initial biopsy of the primary tumor ranged from 7 to 46 years (mean 21 years). The anatomic sites varied. Four tumors occurred in the head and neck region, two on the back, and the remainder on the lower or upper extremities. Two of the patients had a family history of melanoma. None had a history multiple atypical/dysplastic nevi. Before their referral to MSKCC, two patients developed satellite nodules after excisions of the primary tumor. All patients with a positive SLN underwent regional lymph node dissection. One patient was found to have three additional lymph nodes involved by metastatic tumor.

### Pathologic Findings

Thickness and mitotic index are listed in Table 1. All primary tumors involved the epidermis and papillary and reticular dermis. Their thickness ranged from 0.9 to 12

TABLE 1.

Patient no.	Age (yr)	Sex	Tumor site	Tumor thickness	Mitoses per mm <sup>2</sup>	SLN status	Satellite nodules	Other LNs	Follow-up
1	14	F	Back	7 mm	3	–	No		NED after 36 mo
2	14	F	Back	3.7 mm	2	–	No		NED after 34 mo
3	25	F	Right jaw	2.5 mm	6	–	No		NED after 13 mo
4	46	F	Right knee	0.35 mm	2	–	No		NED after 51 mo
5	22	F	Left thigh	1.5 mm	0	–	No		NED after 13 mo
6	7	M	Right ear	6.5 mm	2	+	Yes (1)	3NL+	NED after 34 mo
7	13	M	Right ear	12 mm	2	+	Yes (2)	–	NED after 54 mo
8	28	F	Neck	2.3 mm	4	+	No	–	NED after 10 mo
9	20	M	Right arm	2.4 mm	5	+	No	–	NED after 53 mo
10	26	F	Buttock	0.8 mm	2	+	No	–	NED after 39 mo

+, positive for melanocytic tumor deposits in lymph node parenchyma.

–, negative for melanocytic tumor deposits.

NED, no evidence of disease.

mm. None of the tumors was ulcerated. Four were heavily pigmented. Four lacked readily detectable melanin pigment (pauci- or “amelanotic” tumors). All lesions were composed of a mixed population of spindle and epithelioid melanocytes. A single neoplasm was composed predominantly of spindle cells and demonstrated areas of stromal desmoplasia (desmoplastic tumor). Rare small dull pink globules (Kamino bodies) were seen at the dermoepidermal junction of all but one tumor. None of the tumors demonstrated large well-formed and/or numerous Kamino bodies. All consisted of at least a minor population of pleomorphic epithelioid melanocytes with large irregular nuclei, which were either hyperchromatic or showed prominent eosinophilic nucleoli. Features of zonation in depth (“maturation”) were seen in eight lesions. All but one had mitotic figures in dermal melanocytes with the mitotic index ranging from 0 to 6 mitoses/mm<sup>2</sup>. In six tumors mitotic figures were found in the lower third of the dermal component.

Half of the patients had an SLN with melanocytic tumor deposits in the lymph node parenchyma. In two cases the metastasis was recognized on routine hematoxylin and eosin-stained sections. In one of them metastatic tumor occupied approximately 30% of the lymph node, whereas in the other case only 5% of the node was involved by tumor. In three cases microscopic tumor deposits became apparent only after multistep sections and immunohistochemical studies for melanocytic differentiation markers were examined.

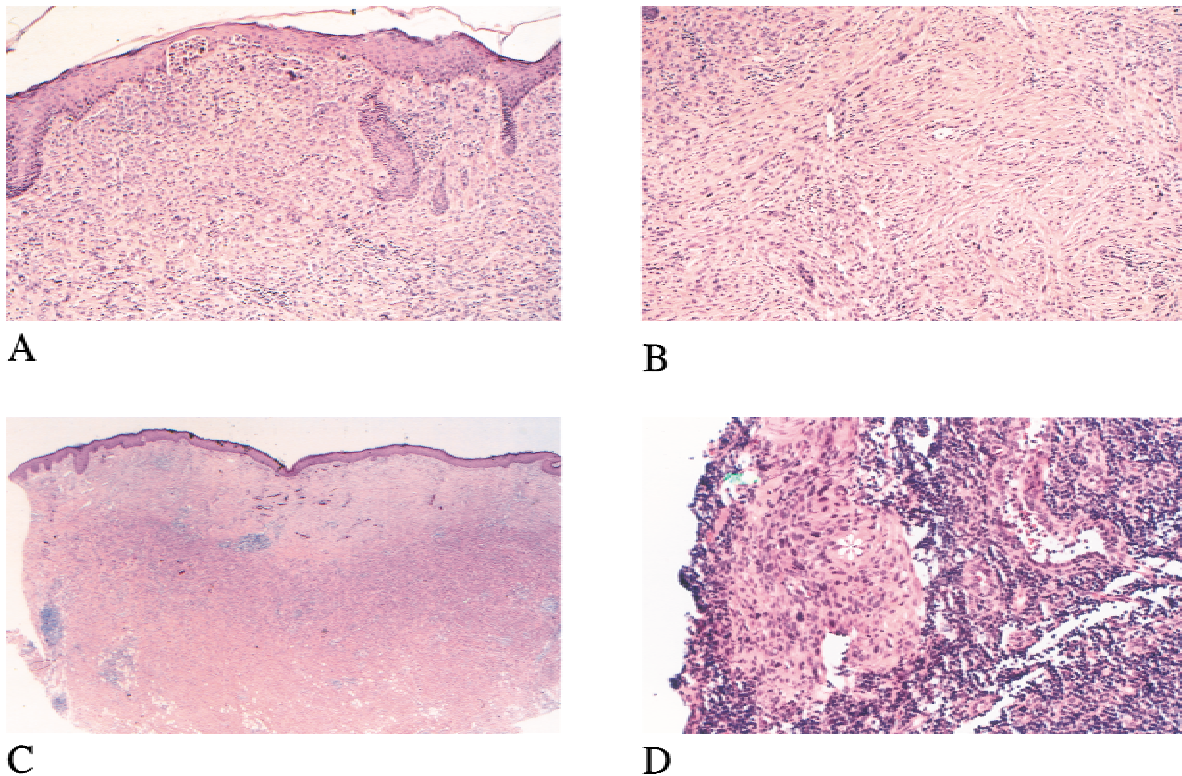
Three examples of melanomas are shown in Figures 1–3 to illustrate the spectrum of histopathologic changes. Figure 1 shows a desmoplastic melanocytic tumor. Irregular nests of epithelioid melanocytes were seen at the dermoepidermal junction (Fig. 1A). The dermal component was amelanotic and composed of a dense population of epithelioid cells infiltrating the dermis in a single cell pattern (Fig. 1A). In the mid and deep dermis spindle cells predominated and were associated with fibrosis (Fig. 1B). Recurrent tumor involved the deep dermis and

subcutis in a sarcomatoid pattern (Fig. 1C). In the subsequent excision a satellite nodule was found (not shown). The SLN contained desmoplastic tumor recognizable on a hematoxylin and eosin-stained section (Fig. 1D), which was strongly immunopositive for S-100 protein.

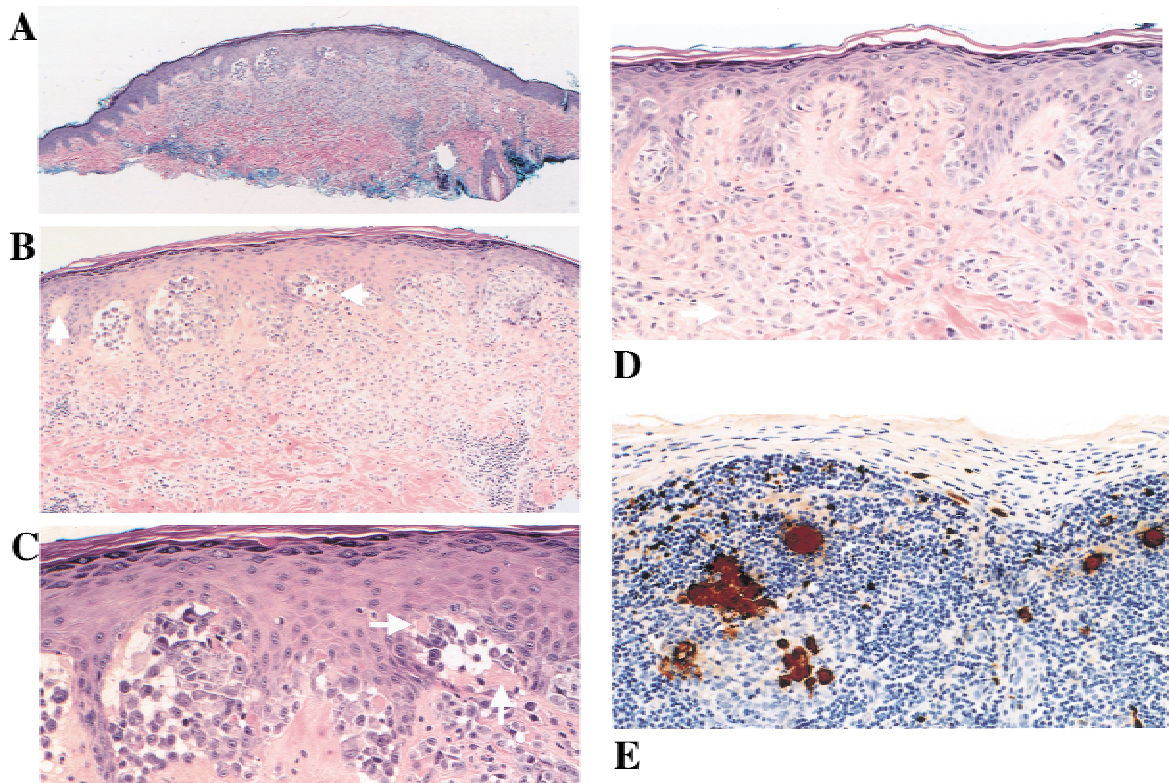
Figure 2 illustrates an epithelioid melanocytic tumor. The lesion was relatively small and fairly symmetric and had sharp lateral borders (Fig. 2A). The V-shaped dermal component was infiltrative at its base. At the periphery of the lesion, lymphocytes were seen around dermal vessels. The epidermis was hyperplastic. Melanocytes were discohesive in junctional nests of varying size and shape (Fig. 2B). Focally, melanocytes in solitary units were seen at all layers of the epidermis (pagetoid spread, Fig. 2D). The underlying dermal component showed poor maturation. Dull pink globules were seen in the junctional zone (Fig. 2B, C). Mitoses were present in dermal melanocytes (Fig. 2D). Clusters of atypical epithelioid melanocytes were found in the SLN parenchyma. These were best seen in a section immunostained for S-100 protein (Fig. 2E).

An amelanotic tumor with a prominent spindle cell nodule is featured in Figure 3. Stromal desmoplasia was not observed. Clusters of small epithelioid and multinucleated melanocytes were adjacent to the spindle cell nodule (Fig. 3B). Mitoses were readily identified and present in the deep dermal component of the tumor (Fig. 3C). Immunohistochemical studies for S-100 protein revealed small deposits of tumor cells in the parenchyma of the SLN (Fig. 3D).

A statistical analysis was performed to examine the association of variable histologic parameters with the status of the SLN. The parameters included tumor thickness, mitotic index, and the presence or absence of satellite nodules and Kamino bodies. None of these parameters was associated with a strong p value (tumor thickness:  $p = 0.46$ ; number of mitoses:  $p = 0.74$ ; Kamino body:  $p = 0.32$ ; and satellite nodule(s):  $p = 0.13$ ).

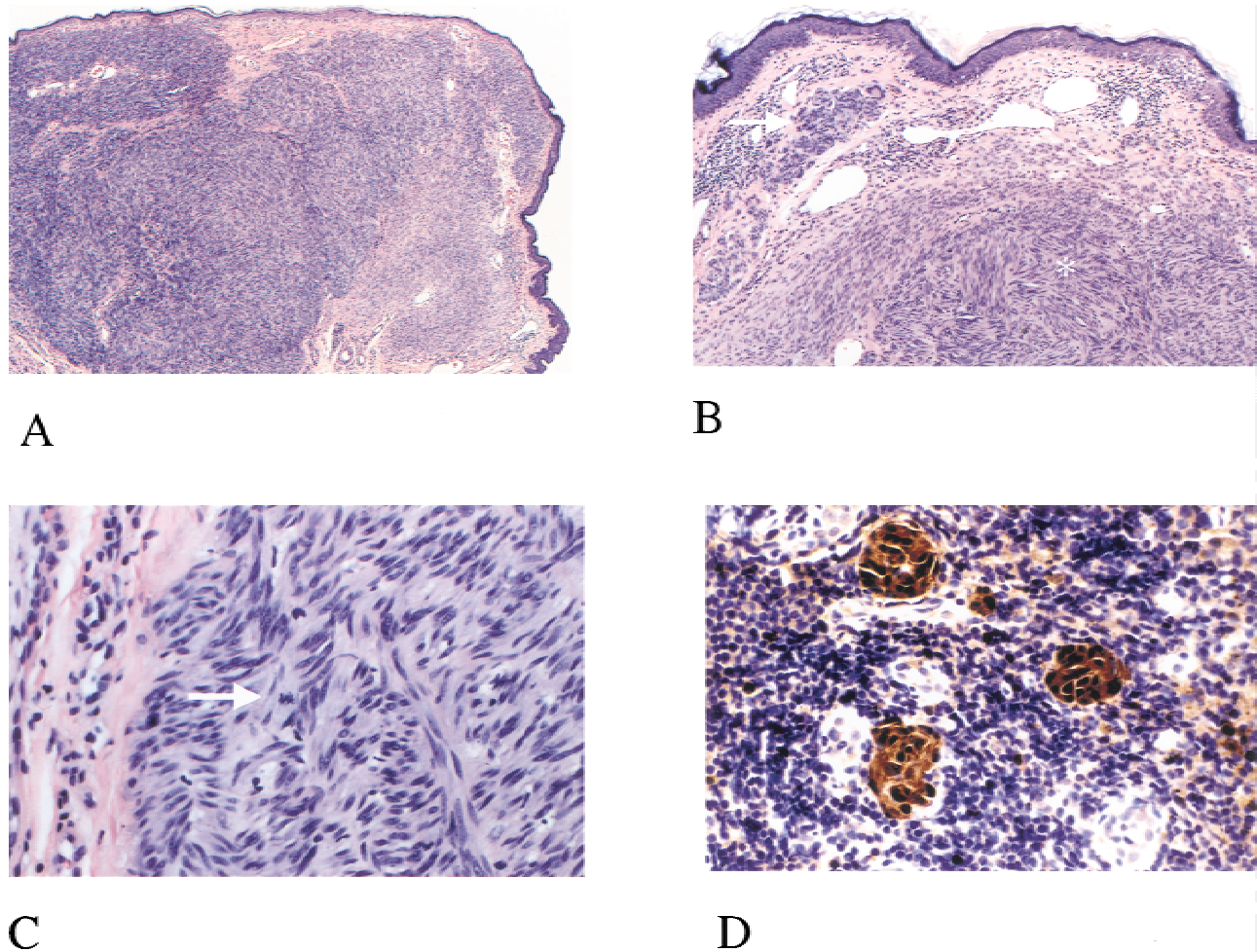


**FIG. 1.** Desmoplastic Spitz tumor located on the ear of a 7-year-old boy. **(A)** Junctional nests of atypical epithelioid melanocytes are seen. Melanocytes infiltrate the dermis in a dense and diffuse single cell pattern. **(B)** Spindle cells with desmoplasia are present. **(C)** Local recurrence after excision of the primary tumor shows a dermal scar and infiltration of the dermis and subcutis by a dense population of melanocytes. **(D)** SLN with metastatic melanocytic tumor deposit (\*).



**FIG. 2.** Epithelioid Spitz tumor located on the buttock of a 13-year-old girl. **(A)** Silhouette of the lesion. Sharp lateral demarcation, associated epidermal hyperplasia, and a V-shaped dermal component are seen. **(B)** Epithelioid melanocytes are discohesive in junctional nests. Maturation is poor. The base of the lesion shows an infiltrative pattern. Dull pink globules are seen (arrows). **(C)** Several pink globules are seen at the dermoepidermal junction (arrows). **(D)** Melanocytes are present as solitary units in the spinous and granular cell layer of the epidermis (\*). Mitoses (arrow) are identified in dermal melanocytes. **(E)** Metastatic tumor deposits are seen in the parenchyma of the SLN (immunopositive for S-100 protein).





**FIG. 3.** Nondesmoplastic spindle cell tumor on the neck of a 28-year-old woman. **(A)** Silhouette of the primary tumor. **(B)** A spindle cell nodule (\*) is juxtaposed to small clusters of spindle and epithelioid melanocytes with multinucleated cells (arrow). **(C)** Mitoses are seen (arrow) near the base of the lesion. **(D)** Metastatic tumor deposits are present in the parenchyma of the SLN (immunopositive for S-100 protein).

### DISCUSSION

Most melanocytic nevi, including those composed of large spindle and/or epithelioid cells (Spitz nevi), can be reliably distinguished from malignant melanoma by histopathologic analysis. However, atypical melanocytic tumors, which show features intermediate between obvious nevus and clear-cut melanoma, exist. At times it can be difficult or even impossible to determine with certainty, on morphologic grounds alone, whether such tumors are benign, albeit unusual nevi, nevi undergoing changes toward melanoma, or outright malignant melanoma in disguise (malignant melanoma mimicking a nevus).<sup>5,27,28,32,43,47,51–53</sup>

Melanomas closely mimicking nevi have also been termed “nevroid melanoma.”<sup>27,28,39,51–53</sup> These tumors are said to represent variants of nodular melanoma. They typically have a deceptively nevroid silhouette, lack prominent intraepidermal pagetoid spread, but show cytologic atypia, lack of maturation, and dermal mitoses.

Pathologists relying on architectural features at scanning magnification alone risk misinterpreting these melanomas as nevi. Although the term “nevroid melanoma” has didactic value in reminding pathologists that some melanomas are more difficult to distinguish from nevi than others, there is continued controversy over whether to accept nevroid melanoma as a biologically distinct subtype of melanoma or not. Some have suggested a better than expected prognosis for nevroid melanomas.<sup>28</sup> Others have argued that nevroid melanoma and “conventional” melanomas have a similar biology.<sup>39</sup> Variants of nevroid melanoma have been described simulating Spitz nevus, similar to the tumors described in this series.<sup>51,52</sup>

The difficulty in distinguishing Spitz nevi from Spitz nevus-like malignant melanoma is mirrored by the fact that the pathology literature on the subject is confusing. Most authors agree on the importance of symmetry and sharp lateral demarcation for the diagnosis of a nevus, including a Spitz nevus.<sup>3,10,13,22,44,48</sup> However, there is conflicting information in several articles and text-

books on various other salient histologic criteria said to be useful for discriminating a Spitz nevus from melanoma.<sup>13,21–24,33,43,48</sup>

Whereas Sophie Spitz suggested that giant cells were important for diagnosis,<sup>45</sup> others attribute to them at most a minor diagnostic role.<sup>48</sup> Many authors believe that evidence of maturation of dermal melanocytes is helpful for the distinction of Spitz's nevus from melanoma.<sup>4,10,13,22</sup> Kern and Ackerman, however, thought that maturation is uncommon in Spitz nevi and therefore of little diagnostic value.<sup>21</sup> Whereas Helwig stated that Spitz nevi characteristically displayed an infiltrative growth pattern at their base,<sup>17</sup> Kern and Ackerman suggested the opposite,<sup>21</sup> i.e., that Spitz nevi tended to push rather than infiltrate the stroma. There is also controversy with regard to the significance of cytologic atypia and mitotic figures in dermal melanocytes.<sup>1–3,22,33,44,46</sup> Some authors have suggested that the presence of pleomorphism and mitotic figures is a clue to the recognition of malignant melanoma.<sup>14,35,44</sup> Others have countered that too much attention to cytologic features and mitoses may lead to misdiagnosing nevi as melanoma.<sup>2</sup>

There is also uncertainty about the diagnostic significance of Kamino bodies. Kamino et al. reported in 1979 that dull pink globules were commonly found in Spitz nevi but rarely seen in association with melanomas.<sup>18</sup> Although it was initially thought that the globules resulted from apoptosis of keratinocytes and/or melanocytes,<sup>18</sup> they have since been shown to represent aggregates of basement membrane material<sup>40</sup> and not apoptotic cells.<sup>49</sup> Kamino bodies are in our experience a very helpful clue for the diagnosis of Spitz nevi. When large and numerous, their presence strongly favors a nevus. However, rare small Kamino bodies are not specific for Spitz nevi and can be seen in other nevi as well as in malignant melanomas, which limits their diagnostic value.<sup>3,4,18,48</sup> Kamino et al. noted eosinophilic globules in 2% of melanomas.<sup>18</sup> Others have found a higher incidence and reported that Kamino bodies can be numerous in some melanomas.<sup>4</sup> In the series reported herein, Kamino bodies were seen, albeit only rarely so, in all but one case. Only hematoxylin and eosin-stained sections were examined. Additional sections were not available to perform trichrome or periodic acid–Schiff stains with diastase to confirm the authenticity of Kamino bodies beyond dispute. As assessed in this study, Kamino bodies had no predictive value for the status of the SLN.

LeBoit had recently pointed out that the dermatopathology literature lacks a well-documented case of a melanoma, proven to be malignant by follow-up, with numerous well-formed Kamino bodies in the primary tumor.<sup>22,23</sup> Because Kamino bodies were small and rare in our cases, we could not evaluate the value of numer-

ous dull pink globules in predicting SLN status. Although we agree with LeBoit that well-formed Kamino bodies are exceedingly rare in melanoma, we have seen rare metastasizing melanomas with bona fide Kamino bodies (K.J.B., personal observations).

A major drawback of several studies on Spitz nevi is the lack of long-term clinical follow-up. In the series by Paniago-Pereira et al., for example, clinical follow-up was "three years at most" and no information was provided on mean or median follow-up.<sup>33</sup> Thus, proposed criteria for the distinction of Spitz nevus from melanoma from such studies cannot be considered as fully validated and need to be applied with caution. Barnhill et al. recently pointed out that many reports on Spitz nevi are virtual tautologies, in that many pathologists re-examined their own case collections retrospectively for the purpose of publication.<sup>5</sup>

Given the limitations of morphologic analysis, several attempts have been made to explore the use of ancillary techniques for the diagnosis of Spitz tumors.<sup>8,19,24,25,34,50</sup> A number of investigators have suggested a role for MIB-1 immunoreactivity as an adjunct to the histopathologic distinction of Spitz nevus from melanoma.<sup>8,19,24</sup> Bastian et al. have explored the use of comparative genomic hybridization in the analysis of melanocytic tumors.<sup>6,7</sup> They have found distinct genetic alterations for some Spitz tumors, such as an 11p copy number increase in desmoplastic Spitz nevi.<sup>6</sup> This is in contrast to malignant melanomas, which typically have more complex chromosomal alterations. Although this approach shows promise in providing useful information on the biology of melanocytic tumors, it is currently premature to apply these findings for diagnosis.

Currently, diagnostic judgments still need to rely on histomorphologic analysis, and a number of criteria useful for the distinction between Spitz nevus and melanoma have been reported. These include architectural and cytologic parameters. In our experience of patients with metastatic melanomas, whose primary tumor had been misdiagnosed as Spitz nevus, failure to recognize melanoma typically occurred by reliance on architectural criteria alone (K.J.B., personal observations). The tumors appeared nevoid by silhouette (symmetric, sharp lateral demarcation, minimal or no pagetoid spread, predominant nested arrangement of cells) but showed atypical cytologic features (presence of mitoses and pleomorphism, lack of maturation and Kamino bodies). Recent studies with >3 years' follow-up of several patients have suggested that a number of histologic parameters can help gauge the malignant potential of a Spitz tumor.<sup>44,47</sup> Large size (>1 cm), tumor extension into the subcutis, the presence of ulceration, and a high mitotic index seem to correlate with malignant behavior, at least in patients after the onset of puberty. Because some Spitzoid melanocytic neoplasms are too difficult to classify reliably as

atypical nevus or melanoma, Spatz and Barnhill have proposed replacing the dichotomous distinction of benign versus malignant with a grading system that allows stratification of atypical tumors into low, intermediate, and high risk groups for recurrence.<sup>43</sup> When applied to our series, all the tumors fell into the low risk category and the score did not correlate with SLN status.

When pathologists cannot agree on a diagnosis or admit that a tumor is of uncertain malignant potential, clinicians and patients face a dilemma with regard to guidelines for management and prognosis. As long as the possibility of melanoma cannot be excluded, it is a reasonable and common practice for surgeons to excise an atypical Spitz tumor as if it were a melanoma. A different issue is the role of a SLN biopsy.

SLN biopsy has become the standard of care for the workup of patients with primary cutaneous melanoma with a tumor thickness  $\geq 1$  mm.<sup>26</sup> Recent evidence indicates that as with other solid tumors, the status of the SLN is a powerful predictor of clinical outcome for patients with stage I and stage II melanoma.<sup>12,16,26,29</sup>

Given the low morbidity of the procedure, it has been suggested that SLN biopsy may also serve as an adjunct procedure in the evaluation of diagnostically difficult melanocytic tumors by increasing the sensitivity of the diagnosis and providing potentially useful prognostic information.<sup>20</sup> Although a histologically negative SLN is not a guarantee against future recurrences and spread of a tumor, a positive lymph node (i.e., metastasis, not nodal nevus) can be assumed as evidence for the malignant potential of a tumor. We agree with Ackerman et al. that "the notion of metastasizing Spitz's nevus is illogical and without foundation."<sup>2</sup>

In this report we document melanocytic tumor deposits in the SLNs of half of our patients, whose primary tumor was reported at outside institutions as an atypical Spitz nevus. The pattern of lymph node involvement was typical of metastases, with multiple clusters of melanocytes in the lymph node parenchyma. Furthermore, the cytology of the melanocytes in the SLNs was atypical (enlarged nuclei, presence of nucleoli) and resembled the appearance of the cells in the primary tumor. No involvement of the lymph node capsule by melanocytes was seen in any of the cases. Thus, we believe that the evidence argues against nevic deposits. Although we considered the possibility of a nodal nevus component associated with Spitz nevus, there is insufficient knowledge about this phenomenon and the patterns of lymph node involvement one might observe.<sup>23</sup>

The high incidence of metastases in our series is most likely a reflection of referral bias and the fact that many tumors were thick (mean thickness 3.1 mm). In a recent series by Nguyen et al., <20% of SLNs were positive in patients with melanomas thinner than 3 mm, whereas >50% were positive if the tumor thickness exceeded 3

mm.<sup>31</sup> Other series have also found an association between the incidence of metastasis and tumor thickness, however, with an overall lower frequency of positive SLNs.<sup>12,16,29</sup> When we performed a statistical analysis of several histologic variables of the primary tumors for a correlation with SLN status, no parameter had a strong *p* value, a result that is most likely due to the small sample size of our series.

Although melanoma had already been considered or favored by some pathologists at the time of review at MSKCC or elsewhere, the finding of a positive SLN supported the diagnosis of malignant melanoma. New questions, however, have emerged. What is the prognostic significance of a positive SLN in a patient with a Spitzoid melanoma and does it differ from the prognosis of a positive SLN in a patient with conventional melanoma? What are the diagnostic and prognostic implications of node-negative DCSMT? These are questions that require multi-institutional studies with long-term follow-up in parallel with conventional melanomas. They cannot be answered at the current time. Many issues related to SLN biopsy findings are still unsettled even for conventional adult-type melanomas, including the prognostic significance of small metastatic tumor deposits, which are recognized best or only by immunohistochemical studies. Preliminary data from patients with conventional melanoma indicate that patients with only small microscopic metastases in their SLN have a low risk for recurrence (D.G.C., M.S.B., K.J.B., unpublished observations). Such small metastatic deposits were seen in three of our five cases with positive SLN. The presence of only micrometastatic disease in three patients likely played a role in the fact that the overall clinical outcome of our patients with positive SLNs has so far been good (at last follow-up all were alive and free of disease).

Some have proposed that melanomas sharing features of Spitz nevi or closely mimicking nevi differ in their biologic potential from conventional epithelioid melanomas. Although it is possible that melanocytic neoplasms exist with genetic alterations different from both typical melanomas and benign nevi, the concept of a low-grade melanocytic tumor category remains at the current time an unproven albeit valid hypothesis. The notion that melanomas with features of Spitz nevus could carry a better prognosis than melanomas without such features even after regional lymph node metastasis is more controversial.<sup>15</sup> Contrary to the suggestion of some pathologists that metastases from spindle cell and epithelioid cell nevi with atypia may arrest at the regional lymph node,<sup>41,42</sup> we and others have seen several cases of metastases from Spitz nevus-like melanomas with lethal outcome. The melanomas with positive SLN presented in this series differ from the metastasizing melanocytic tumors previously reported as "malignant Spitz nevus."<sup>41,42</sup> The primary tumors in this series were smaller

(<1 cm in diameter), did not extend into the subcutis, and lacked ulceration. Furthermore, the tumor deposits in the SLN also tended to be smaller than the metastases from the tumors reported by Smith et al.<sup>42</sup> and Skelton et al.<sup>41</sup> Because the term "malignant Spitz nevus" is contradictory in itself, we advise against its use. Melanocytic tumors found to have metastatic tumor deposits in lymph node(s) should be designated as malignant melanoma.

In conclusion, we report herein the first series of patients with DCSMT who underwent SLN biopsy. Given the low procedural morbidity, it seems reasonable to consider this technique in the care of patients with such tumors. An SLN biopsy, however, should not be used as a substitute for professional consultation. In our view, it is in the patient's best interest for any pathologist uncertain about an unusual melanocytic tumor representing nevus or melanoma to first consult other experienced colleagues. If several pathologists suspect melanoma, an SLN biopsy seems justifiable. If an SLN is positive, this finding helps to support the diagnosis of malignant melanoma. Conclusions about the prognostic significance of a positive SLN in a patient with a Spitz nevus-like melanoma, however, are currently premature. Further studies are needed to assess whether the features of the primary tumor, which deviated from both nevus and conventional melanoma, justify a separate prognostic category for these patients. □

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