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The Frequency of Histologically Dysplastic Nevi in 199 Pediatric Patients

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Abstract: Many uncertainties surround the definition, frequency, and significance of dysplastic nevi in children. Consequently the management of dysplastic nevi in the pediatric population has been largely derived from the studies of adults. Biopsies are usually performed on this young age group because of lesion change or abnormal appearance. One might therefore assume that the frequency of histologically diagnosed dysplastic nevi would be higher in children than in adults. We decided to attempt to verify this assumption by determining the frequency of dysplastic nevi diagnosed histologically in the pediatric population. To do this we reviewed 199 cutaneous pathology reports of nevi removed from patients less than 18 years old and submitted to a community-based dermatopathology laboratory. The diagnosis of dysplastic nevus was made based on histologic criteria recommended by the World Health Organization Melanoma Program. We found that 3 of 199 nevi submitted for histologic analysis met the histologic criteria for dysplastic nevus. There were no melanomas. Our data suggest that there is an extremely low frequency of histologically confirmed dysplastic nevi within the general pediatric population.

Dysplastic nevi (DN) are claimed to be potential precursors of melanoma and markers of increased melanoma risk (1–4). The clinical prevalence of dysplastic nevi in the Caucasian population has been estimated to be between 2% and 20% (5–11), but has been reported to be as high as 53% when histologic criteria were used (12). These percentages are largely derived from studies of adults. Less is known about both the frequency of DN and the relationship of DN to the development of melanoma in children. Up to 37% of children from melanoma-prone families have been found to have clinically or histologically diagnosed DN. The mean age of diagnosis of DN was 13.6 years (13). The prevalence of clinically atypical nevi in Australian children has been reported to be 3.9% by the age of 6 and 21% by 15 years of age (14). There are no studies that we are aware of that examine the frequency of histologically dysplastic nevi in children from nonmelanoma prone families. Thus we were interested in determining the frequency of histologically confirmed DN occurring in young individuals from a community-based practice. There is considerable controversy over what constitutes a dysplastic nevus, as universally accepted criteria for the clinical or histologic diagnosis of DN do not exist (12).

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For the purpose of this study, we used histologic criteria outlined by the World Health Organization Melanoma Program (15) to make the diagnosis of dysplastic nevus. We reviewed 199 cutaneous biopsy specimens from patients less than 18 years of age that were submitted with a clinical diagnosis of nevus. We made the assumption that most clinicians are conservative in their removal of pigmented lesions in children and are less likely to remove lesions for cosmetic purposes in comparison with adults.

MATERIALS AND METHODS

We reviewed 1978 cutaneous pathology reports from specimens submitted with the clinical diagnosis of nevus. The reports were selected from four 1-week intervals over a 1-year period. The material was collected from a large regional non-hospital-based dermatopathology laboratory (Laboratory Corporation of America, Louisville, KY) that processes and interprets skin biopsy specimens submitted by physicians from a four-state Midwestern and Southern region. Clinical diagnoses included in the study were nevus, junctional nevus, compound nevus, intradermal nevus, blue nevus, halo nevus, and benign mole with or without a differential diagnosis that included atypical or dysplastic nevus, or ruled out melanoma. Data collected from the pathology reports included the patient's name and age, the submitting physician's name, the preoperative clinical diagnosis, and the microscopic diagnosis. The initial microscopic diagnoses obtained from the pathology reports were determined by five physicians with special certification in dermatopathology who routinely evaluate skin specimens for this laboratory. These physicians use the term junctional or compound nevus with architectural disorder and some degree of atypia for the diagnosis of dysplastic nevus. All specimens with a histologic diagnosis of dysplastic nevus in a child, defined as a person 18 years of age or younger, were histologically reviewed and confirmed by two of the authors (A.F.H., J.H.). Further clinical history, including presence at birth and a family history of dysplastic nevus syndrome or melanoma, was obtained from a parent (Table 1).

We used the following histologic criteria as outlined by the World Health Organization Melanoma Program to establish the diagnosis of dysplastic nevus. Major criteria included basilar proliferation of atypical nevomelanocytes extending at least 3 rete ridges beyond any dermal nevomelanocytic component, and organization of this proliferation in a lentiginous or epithelioid-cell pattern. Minor criteria included the presence of papillary dermal fibrosis, inflammatory host response, neovascularization, and fusion of rete ridges. To make the diagnosis of dysplastic nevus we required that both major criteria and at least two minor criteria be met (15). Clinical atypia was based on the subjective interpretation of the clinician.

RESULTS

A total of 1978 lesions were submitted with the clinical diagnosis of nevus (with or without modifiers). Among them, 1351 lesions had a confirmed microscopic diagnosis of melanocytic nevus or variant thereof. Forty-five of these lesions were from patients younger than 12 years and 154 were from adolescents between the ages of 13 and 18 years, for a total of 199 specimens from the pediatric age group. Of the 199 specimens clinically and histologically shown to be nevi, 66 were clinically unusual and were suspected to be dysplastic nevi (60) or melanoma (6).

Three (1.5%) nevi met the histologic criteria for a diagnosis of dysplastic nevus. All three lesions were clinically atypical as described by the submitting physician. Of those nevi showing histologic dysplasia, one was present in the 3- through 12-year age group and two were present in the 13- through 18-year age group (Table 1).

All of the histologically dysplastic nevi in the pediatric population shared the histologic features of lentiginous proliferation and bridging of nests of atypical melanocytes along the dermoepidermal junction, extension of the epidermal component of the nevus beyond the dermal component, elongation of the rete ridges, and fibrosis within the papillary dermis (Fig. 1). All three had a scant to mild lymphocytic infiltrate associated with the nevus.

Other histologic diagnoses of the remaining 196 submitted nevi included the following: Spitz nevus ($n = 4$), halo nevus ($n = 3$), congenital nevus ($n = 28$), and benign nevocellular nevus (junctional, compound, and

TABLE 1. *Clinical Data on Three Dysplastic Nevi in Children/Adolescents*

Patient/Age (years)/Sex	Size of Lesion (mm)	Location	Submitting Diagnosis	Congenital by Parental History	Family History of Melanoma
1/11/F	5	Posterior shoulder	Irritated versus dysplastic nevus	Negative	Negative
2/16/M	10.5	Scalp	Rule out dysplastic nevus	Negative	Negative
3/17/F	6	Scalp	Rule out atypical nevus	Negative	Negative

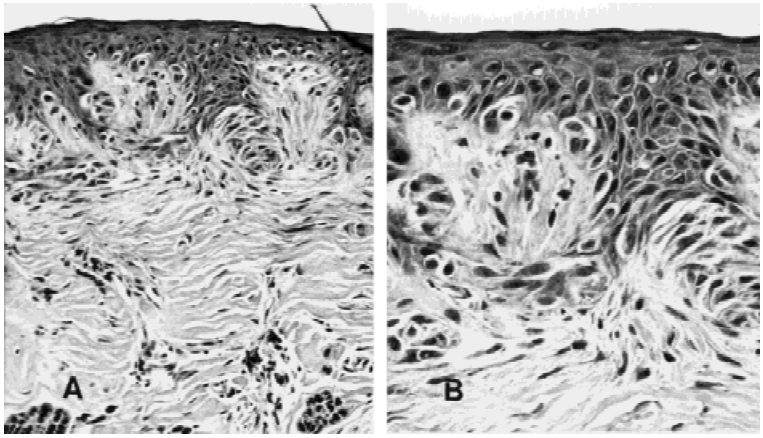

Figure 1. Histologic features of dysplastic nevus in a child. (A) Note papillary dermal fibrosis and bridging of melanocytic nests with elongated rete ridges. (Hematoxylin and eosin; original magnification 50×.) (B) Note the lentiginous proliferation of melanocytes. (Hematoxylin and eosin; original magnification 100×.)

intradermal) ($n = 160$). The remaining lesion did have an atypical melanocytic proliferation of melanocytes, but did not fulfill the criteria for the diagnosis of dysplastic nevus. Six lesions were removed because the clinician was concerned about the possibility of melanoma. These lesions occurred in patients ages 14–17 years. All were shown histologically to be nevocellular nevi without dysplastic features. No melanomas were observed in this young population.

DISCUSSION

Using World Health Organization published criteria for the histologic diagnosis of dysplastic nevi we found that 2.2% of nevi submitted for histopathologic diagnosis from children ≤12 years old and 1.3% of nevi from adolescents in the community-based population examined fulfilled the histologic criteria for dysplastic nevi. The frequency of histologically dysplastic nevi that we observed in this pediatric population is significantly lower than the prevalence of clinically diagnosed dysplastic nevi in Australian childhood nevus studies and in children from melanoma-prone families (13). To our knowledge there are no similar studies examining histologically diagnosed dysplastic nevi in children for comparison with ours.

Of 66 clinically atypical nevi in our study group, only 3 were histologically dysplastic. Studies of adults have demonstrated that the histologic diagnosis of dysplastic nevus is not particularly reliable (12). The low percentage of histologic DN that we observed in specimens from children is in contrast to the relatively high percentage of DN in adult population specimens from the same laboratory (16). The poor correlation between clinical atypia and histologic dysplasia in this pediatric population is consistent with the findings in adults.

In conclusion, the general consensus of pediatric dermatologists is to manage nevomelanocytic lesions conservatively, removing pigmented lesions only if strongly suspicious for melanoma (17). Our findings of a low incidence of histologically dysplastic nevi and no observed melanomas among pigmented lesions in the children studied support this conservative approach.

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