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Malignant Blue Nevus with Lymph Node Metastases in Five-Year-Old Girl

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Abstract We report an unusual case of a malignant blue nevus in a five-year-old girl, which turned out to be malignant only after the development of lymph node metastases three years after the excision of the primary tumor on the patient's cheek. A functional bilateral neck dissection was performed and the patient is alive with no evidence of disease 8 years after the excision of the primary skin lesion.

Malignant blue nevus is an extremely rare form of malignant melanoma, which is believed to arise from dermal melanocytes, usually in association with a cellular or common blue nevus (1). It was first described by Allen and Spitz in 1953 (2), and Fisher in 1956 (3). Clinically, malignant blue nevus presents as a blue or black-blue skin lesion, measuring from less than 1 cm up to 10 cm in diameter (4). It is preferentially located on the scalp, although other locations include the buttock, lumbar region, foot, back, face, neck, hand, and ear (2,4-7). The average age at diagnosis is 45 years, with a slight male predominance. The number of all published cases is less than 100 and there have been only a few reports of malignant blue nevus in children (1,5,6,8-10). We report an unusual case of a malignant blue nevus in a five year old girl which turned out to be malignant only after the development of lymph node metastases.

Case Report

A five year old girl presented in 1997 with a grayish-blue skin lesion on her left cheek. The lesion has been present for 2 years and has progressively increased in size during the last 6 months. On examination, the lesion was sharply demarcated, non-ulcerated, elevated 2 mm above the surrounding skin, and measuring 4×2 mm. There were no palpable lymph nodes. An excisional biopsy with a 2 mm margin of normal-appearing skin was performed. The histopathological examination revealed an intensely pigmented proliferative melanocytic lesion consisting of an admixture of mildly pleomorphic epithelioid cells with vesicular nuclei and prominent nucleoli, spindle cells with irregular and hyperchromatic nuclei, dendritic melanocytes, and numerous melanophages (Fig. 1). There was no severe atypia, mitoses, necrosis, or vascular invasion. Surgical margins were clear and the diagnosis of benign melanocytic nevus was established at another institution. Due to the benign histology, no regular follow-up was suggested.

Three years later, the girl came back with a palpable, movable, unpainful submental lymph node, measuring 1.5×1 cm. Fine needle aspiration biopsy was performed. Cytological examination revealed pigmented nevus cells; the pathologist therefore suggested tumor extirpation for definitive histological diagnosis. The histopathological examination of the extirpated lymph node revealed a heavily pigmented, partially necrotic tu-

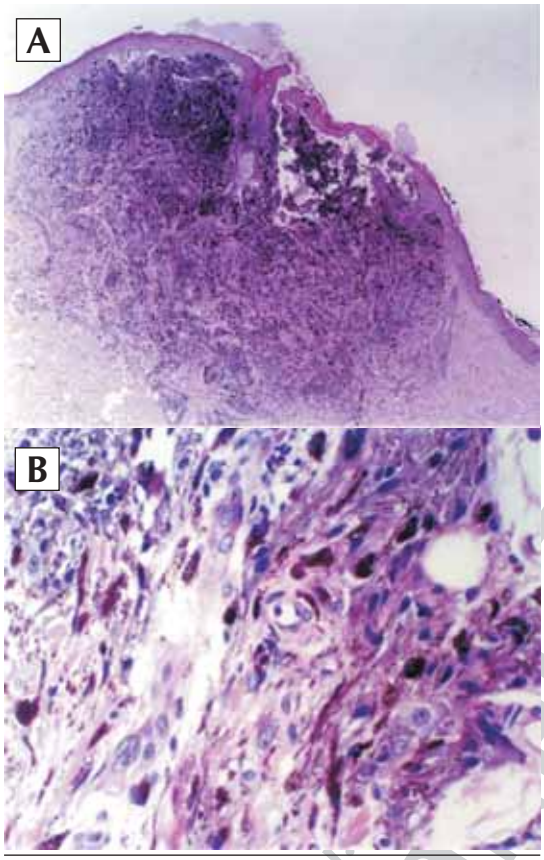

Figure 1. Malignant blue nevus in a child. Low- (**A**) and high-power (**B**) appearance of the intensely pigmented skin lesion, consisting of an admixture of mildly pleomorphic epithelioid cells with prominent nucleoli, numerous spindle cells with irregular and hyperchromatic nuclei, dendritic melanocytes and numerous melanophages (hematoxylin and eosin, original magnification ×4 and ×40 respectively).

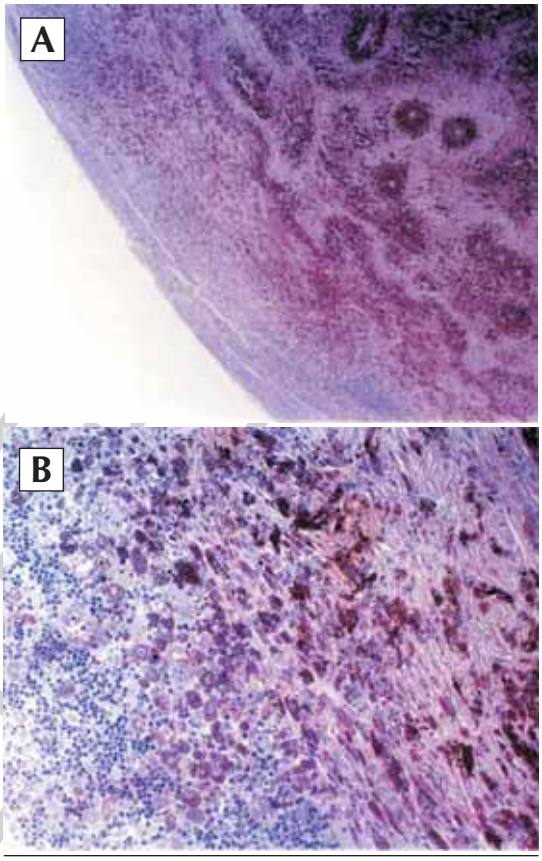

Figure 2. Low-power (**A**) appearance of the lymph node containing a metastatic, heavily pigmented tumor with areas of necrosis. On high-power view (**B**) heavy pigmentation tends to obscure the cytological details. The lesion is composed of both spindle and epithelioid tumor cells, melanophages, and dendritic melanocytes (hematoxylin and eosin, original magnification ×4 and ×40 respectively).

mor, which appeared to extend through the capsule of the lymph node in some areas and suggested the diagnosis of malignant blue nevus (Fig. 2). The revision of the original histology from the lesion on the face, as well as additional immunohistochemical staining of the primary lesion and lymph node metastases, was performed and the diagnosis of a malignant blue nevus was made. Immunohistochemical staining was performed on DAKO TechMate 500 automatic stainer using the ChemMate ™DAKO Envision™ method, with antibodies to S-100 protein, HMB45, Ki-67 (clone MIB-1), and p53 protein (Dako-p53,DO-7; Dako, Glostrup, Denmark).

Immunostained sections were difficult to interpret because of the large amount of melanin in the cytoplasm of the tumor cells. The majority of the tumor cells in the skin lesion and in the metastasis were positive for S-100 protein. The superficial portion of the primary tumor and about one third of the cells in metastasis were HMB45 positive. The percentage of MIB-1 positive tumor cells nuclei in both lesions was low (<5%). p53 was negative in primary and metastatic tumor cells.

The girl was referred to the Institute of Oncology in Ljubljana for additional treatment. Upon several consultations, a modified bilateral neck dissection was performed, in which all five lymph node levels were removed bilaterally, sparing the accessory nerves, sternocleidomastoid muscles, and internal jugular veins. The histologi-

cal examination revealed no metastasis in 75 removed lymph nodes and normal submandibular salivary glands. No additional adjuvant treatment was suggested. The girl is alive, with no evidence of disease 8 years after the excision of the primary skin lesion.

Discussion

Less than a hundred cases of malignant blue nevus have been reported in the literature (1,5,6,9). Malignant blue nevus in children is even more infrequent, with less than 10 reported cases (6,8,10). Given the rarity of this tumor, it is not surprising that it poses a diagnostic difficulty. Malignant blue nevus is a histologically heterogeneous tumor, but shows two major histologic patterns (1). The first is a sheet-like growth of clearly malignant cells in association with common or cellular blue nevus. The second recapitulates the growth pattern of benign cellular blue nevus at low power, but shows at least some features of malignancy, such as infiltrative borders, necrosis, frequent mitoses, nuclear pleomorphism and hyperchromasia, or presence of epithelioid cells with large nuclei and prominent nucleoli, and fine melanin dispersed in the cytoplasm (1). Since these atypical features are not directly juxtaposed with bland-appearing nevus cells, this type of malignant blue nevus is more difficult to recognize.

In the present case, the skin lesion lacked most of the typical architectural or cytomorphological features which would suggest malignancy. It was the development of lymph node metastasis that disclosed its malignant nature. In this respect, our case is similar to that described by Shallman et al (11), who reported a patient with a blue nevus which did not show malignant features at the time of the initial diagnosis, but the patient developed metastases 11 years later and eventually died of the disease.

It should be noted that both common and cellular blue nevi may involve lymph nodes. Whereas the common blue nevi show predilection for the capsule, cellular blue nevi may involve sinuses and parenchyma, thus simulating metastatic melanoma (12). However, in our patient, the heavily pigmented and partially necrotic tumor that appeared to extend through the lymph node capsule in some areas left no doubt of its malignant nature.

Since the girl did not have any other suspicious pigmented lesions, we must assume that the biopsied cheek lesion represented the primary tumor. Other remote theoretical possibilities would be that melanoma arose *de novo* in the lymph node or that it represented a metastasis from a completely regressed cutaneous melanoma at some other site. However, in the context of a clinically changing nature of the blue nevus on the girl's cheek and the subsequent development of melanoma in a lymph node of its draining area, we find those two options highly unlikely.

The differential diagnosis of malignant blue nevus includes primary or metastatic melanoma, clear cell sarcoma, as well as new related entities such as combined nevus, deep penetrating nevus, compound blue nevus, pigment synthesizing melanoma, and pigmented epithelioid melanocytoma (13-15).

Since malignant blue nevus is an extremely rare tumor, there is no special staging scheme for the prognostic purposes. The prognosis of the patients reported in the literature shows a great diversity. The mortality rate varies from as low as 31% reported by Boi (8) to 66% in a series of 12 patients reported by Connely (5). At present, the therapeutic approach to the patients with malignant blue nevus is the same as to the other patients with malignant melanoma. We performed a bilateral modified neck dissection and found no lymph node metastases other than the submental lymph node excised earlier for a diagnostic purpose. Since there are no convincing data about the efficacy of any adjuvant treatment in patients of that age, we decided only to observe the child. She is at three-month follow-up which includes complete clinical exam (skin inspection, scars, and lymph node palpation) and serum determination of S-100 protein.

Although the incidence of malignant melanoma is increasing at a faster rate than that of any other cancer, the malignant blue nevus, which is a variant of malignant melanoma, is still an extremely rare tumor, especially among children under the age of 10 (16). This is the main reason why there are still no commonly accepted clinical and histopathological criteria which would provide a better definition of malignant blue nevus. However, a clinician must be aware of the possibility of malignant transformation of a blue nevus, especially if classical clinical signs of increasing size

and changing colors are present. The threshold to excise such lesions should be low.

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