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CASE REPORT
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Long-term Survival after Metastatic Childhood Melanoma

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Summary: Malignant melanoma in children is very rare and accounts for only 1–3% of all melanomas. A congenital melanocytic nevus depending on the size of the lesion is one of the risk factors for developing childhood melanoma because of the possible malignant transformation. Childhood malignant melanoma is a potentially fatal disease. Surgical excision is the primary treatment of choice for malignant melanoma. Clinicians need to be aware of the possible malignant transformation in children with congenital melanocytic nevus because early diagnosis and treatment improves prognosis. The suspicion of malign melanoma must be in mind when evaluating a pigmented lesion in a pediatric patient. We present a case of a patient born with a congenital nevus diagnosed with metastatic childhood malignant scalp melanoma at the age of 6 years. The patient underwent surgical ablation and reconstruction and has survived 26 years without recurrence, thus representing an uplifting case of long-term survival of childhood melanoma. *(Plast Reconstr Surg Glob Open 2014;2:e163; doi: 10.1097/GOX.0000000000000122; Published online 3 June 2014.)*

Malignant melanoma (MM) is an uncommon type of childhood cancer, and in prepubertal children under 15 years old, it accounts for only 0.3–0.4% of all melanomas. In children and adolescents younger than 15 years, the incidence of disease is approximately 1 of 1,000,000. Nevertheless, it is a potentially fatal disease, and it is important to remember MM as a differential diagnosis of any pigmented lesion in a child.[1–5]

The low frequency and atypical clinical and histological features and a relative lack of reliable pathological criteria for discrimination between malignant and benign melanocytic lesions may lead to delayed diagnosis and treatment.[2,5–7]

Surgery is the mainstay and the only effective therapy for primary MM lesions and for lymph nodes with metastasis. Childhood MM must be treated as aggressively as in adults taken the fact that it may be equally devastating.[3,4] The long-term survival of childhood MM is rarely calculated in the literature.

We report at unique and uplifting case of childhood MM in a 6-year-old patient who in 1988 was surgically treated and now has 26 years of follow-up with no sign of recurrence.

CASE REPORT

The patient was born in 1982 with a congential melanocytic nevus (CMN) in the hair-bearing area of the scalp (Fig. 1A). Eight days after birth, the patient was referred to a dermatologist in the Department of Plastic Surgery in Copenhagen County, but no clinical suspicion of MM was found. The general practitioner (GP) inspected the CMN at the com-

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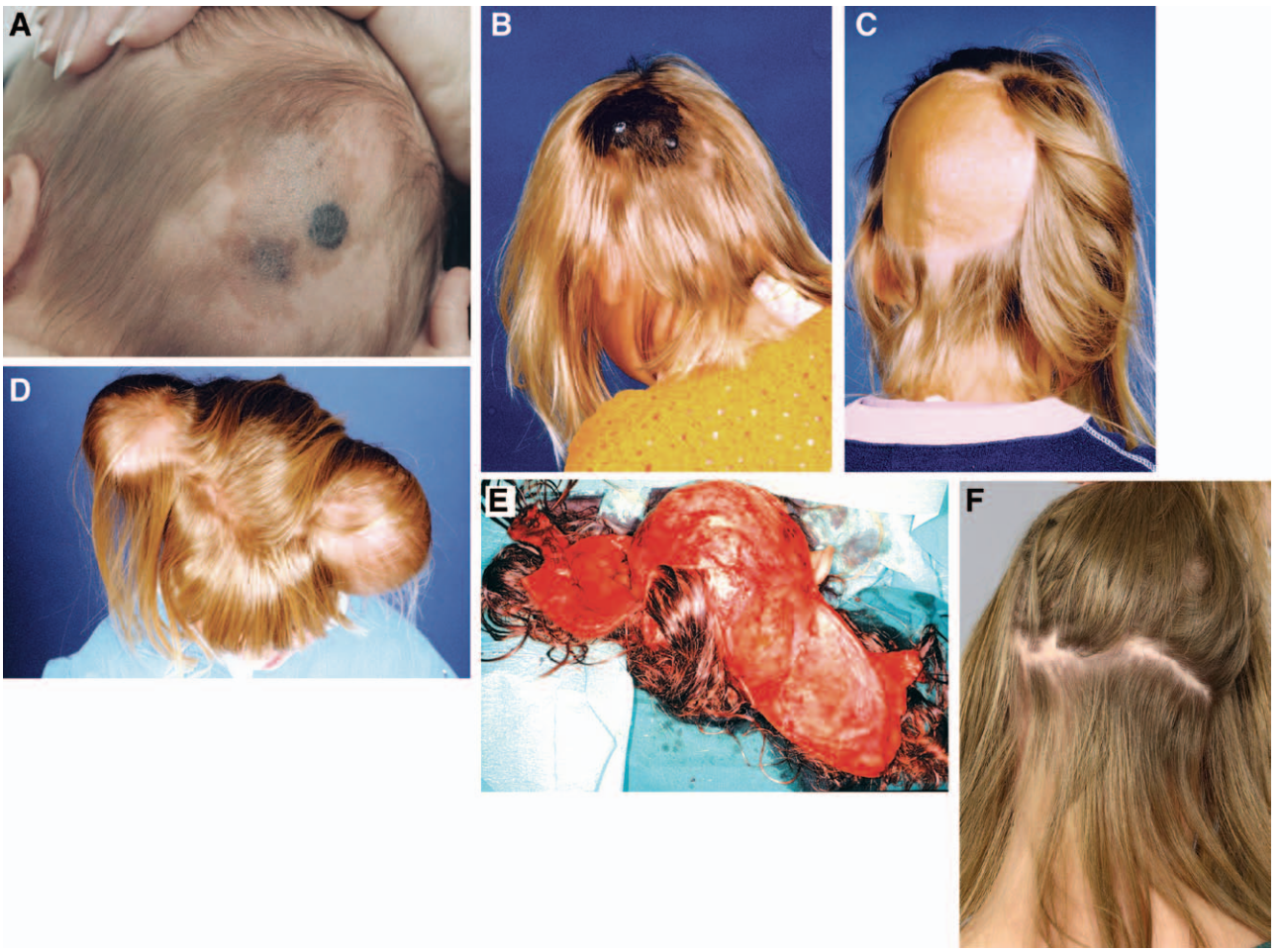

Fig. 1. A, Clinical appearance of the patient with the congenital melanocytic nevus on the scalp shortly after birth in 1982. B, Clinical appearance of the patient with the congenital melanocytic nevus on the scalp when admitted to the Department of Plastic Surgery, Copenhagen, in 1988. C, Clinical appearance of the scalp after the primary excision of malignant melanoma reconstructed with a split skin graft. D, Clinical appearance of the patient after the expansion period. E, Perioperative view of the expanded skin flaps on the scalp, before covering the former large scalp defect. F, Clinical appearance 26 years after surgery in 2014, with an acceptable functional and cosmetic result.

mon childhood examinations. In 1988, at an age of 6 years, the CMN had changed appearance (Fig. 1B), and the GP referred to a dermatologist who also found palpable lymph nodes on the left side of the neck. The patient was immediately referred to the Department of Plastic Surgery, Copenhagen County, on suspicion of MM involving the lymph nodes.

The patient was a happy child with a normal growth pattern and had not received any kind of immunosuppressive treatment. On physical examination, the CMN on the scalp, measuring 7×5 cm, was black with several nodules, the largest measuring 2 cm in diameter. Several swollen, palpable, and obvious pathological lymph nodes were found below the CMN in the left occipital and lateral neck region. Lymph scintigraphy showed lymphatic drainage to the regional cervical lymph nodes on the left side and the occipital lymph nodes on both sides. Blood samples were normal, and x-ray of the chest showed no sign of dissemination.

On the suspicion of MM, the patient was prepared for surgery under general anesthesia.

Microscopic examination of tumor biopsy gave suspicion of malignant changes in the CMN.

Under the clinical and microscopic suspicion of MM, the CMN was excised in 5 cm range and in depth to the periosteum. The skin defect on the scalp, measuring 15×17 cm, was primarily reconstructed with a split skin graft, see Figure 1C, harvested from the left thigh. Afterward, a complete left neck lymph node dissection including the left occipital node basin was performed. The postoperative stay was uneventful, and the patient was discharged 10 days after surgery. She received no additional oncological treatment.

Microscopic examination of the skin specimen demonstrated nodular cell groups mainly in the deep

dermis and subcutaneous tissue but also with connection to the surface epithelium with several melanocytes in the epidermis. In several areas, the cells showed significant pleomorphism with enlarged nuclei, and several cells had large central nucleoli. The cells in the malignant component had a mixed spindle cell and epithelial-like appearance and they infiltrated the benign CMN; also, mitotic activity was recognized. In conclusion, the diagnosis was a nodular MM developed in a congenital nevus. The wide scalp resection preparation also included a lymph node with domination of hyperpigmented cells that infiltrated and destroyed the normal architecture of the lymph node and with only minor areas of preserved lymphatic tissue. This corresponded to a metastasis from MM. Fourteen lymph nodes from the lymph adenectomy on the left side of the neck showed normal architecture with no sign of metastases from MM.

Nineteen months later, being 7 years old, the patient was hospitalized for reconstructive purposes, with parental consent, for scalp tissue expansion course. Under general anesthesia, 2 expansion prostheses were placed in, respectively, the left and right side of the scalp under galea in the hair-bearing areas. The patient was discharged from the hospital 4 days later. For a period of 2 months, the prostheses were expanded to 460 ml of saltwater in each prostheses (Fig. 1D). At the third surgical procedure, at 8 years old, the patient had the expansion prostheses removed; afterward, the large skin-graft area on the scalp was excised, and finally, the scalp defect was covered with the hair-bearing expanded skin flaps (Fig. 1E). The procedure resulted in complete healing, leaving narrow scars in the area. During a follow-up period of 10 years, there was no evidence of recurrence or malignancy.

Today, 32 years old, the patient is still free of disease—26 years after the initial treatment.

She managed to complete her primary school during the reconstructive course and completed her business school afterward. She is the mother of 2 healthy children and is working full time in a financial department in Copenhagen. She has yearly follow-up with her GP including a clinical skin examination. She will continue the follow-up for the rest of her life. She has no loss of function or restricted motion due to many surgical procedures in the head and neck area.

To some degree, she remembers the cancer episode with consultations and operations at the Department of Plastic Surgery, Copenhagen County. Most of all, she remembers the period with the scalp expanders and refers to this time as unpleasant. Overall, she has no psychological traumas of the whole cancer course and is very happy and pleased with the functional and cosmetic result (Fig. 1F).

DISCUSSION

MM can develop de novo in a CMN as "atypical areas" but can be misdiagnosed as benign lesions.[1,2,8] CMN are visible at or shortly after birth, representing pigment cell malformations that have formed during ontogenesis and are seen in less than 2% of the newborn infants.[9] About 50% of childhood MM occur in association with a preexisting lesion: about 30% within a giant CMN and 20% in association with other lesions, including acquired melanocytic nevi or small- and medium-sized CMN. It is still debated whether or not CMN should be treated, and if so, should it be prophylactic surgical excision.[9]

Surgical excision is the definitive treatment of MM, but adjuvant therapies such as chemo-, immuno-, and radiotherapy can be used in advanced cases.[4,8] Surgical excision margin of MM is depending on the Breslow depth and according to guidelines. Currently, sentinel node biopsy is recommended when tumor thickness is greater than 1 mm or ulceration or dermal mitotic activity is present. If the sentinel node biopsy is positive for MM cells, a complete lymph node dissection should be performed.[4,8,10] In the present case, no sentinel node procedure was performed, in accordance to guidelines in 1988. In adults, the prognostic value of sentinel lymph node biopsy has clearly been demonstrated, where node-negative patients, in contrast to node-positive patients, have a 5-year survival of 90% and 50%, respectively. The small population of pediatric MM patients makes it difficult to access the true prognostic value of sentinel lymph node biopsy, but large studies seem to find a parallel overall survival rate.[6]

Not surprisingly, one of the main factors that influence the overall survival in adults with MM is the presence of metastases at the time of diagnosis. Unfortunately, in children, information about factors that influence the overall survival is limited. In children with widespread disease, reported 5-year survival was about 30%.[1,5] Overall survival of all stages together is significantly worse for children aged 1–9 years than children aged 10–24 years.[7]

According to current guidelines on evaluation of MM, the most important factors to evaluate are tumor thickness according to Breslow, presence or absence of ulceration, and dermal mitotic activity per square millimeter in hotspots. Other parameters that should be evaluated include Clark's level, regression and microscopic satellites, and tumor type.[8,10]

In the presented case, the tumor had developed from a CMN on the scalp, and 1 regional lymph node metastasis was seen at the time of diagnosis.

Furthermore, microscopic description of the tumor included malignant tumor cells in the subcutaneous tissue and mitotic activity, findings which are commonly correlated with poor outcome.[1,5] Unfortunately, the patient's samples in the present case have been disposed, and therefore, we have not been able to reevaluate the samples according to current guidelines.

Children with CMN should be included in a systemic follow-up from birth. A multidisciplinary approach involving dermatologists, pediatricians, family physicians, and plastic surgeons may be needed when evaluating these often confusing CMN. Guidelines recommend follow-up 1–4 times per year, depending on the thickness of the lesion and other risk factors, the first 2 years after diagnosis and 1–2 times per year thereafter.[4]

CONCLUSIONS

In conclusion, we must be aware of MM in children, even though it is rare, because early diagnosis is crucial to outcome, and surgery still remains the primary choice of treatment.

A significant number of recurrences and melanoma-related deaths are seen in pediatric melanoma patients more than 5 years after initial diagnosis. It is necessary for long-term follow-up, including full-body skin examination, in this population—for the rest of their lives.[3,4,11]

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