Case Report

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Congenital Pigmented Nevus With Skin Ossification (Nanta Nevus): A Case Report

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1. Introduction

Bone formation or ossification in skin is a rare phenomenon that may be primary or secondary. Primary cutaneous ossification is mainly seen in Albright hereditary ostedystrophy and primary cutaneous osteoma, without skin lesions before bone formation. Secondary skin ossification usually causes skin lesions and forms bone, which can be seen in a variety of diseases, including pilostomia, basal cell carcinoma, acne, scar, melanocytic nevus, cylindrical tumor, skin tumor, dermatofibroma, epidermoid cyst, inflammatory or traumatic sites, accounting for about 84% of skin ossification [1,2]. The phenomenon of melanocytic nevus with ossification [3] was first described by Heidingsfeld in 1908, which was described in detail by Nanta in 1911, and has since been called Nanta nevus [4]. There are a few reports in the international literature in recent years [5,6], and this disease has not been mentioned in the Chinese literature. We reported a case of a female with the head considered as Nanta nevus according to histopathological characteristics, which may be the first Chinese case on this phenomenon.

2. Case Presentation

The patient presented in this case was a 29-year-old female and was admitted to the Outpatient Department of our hospital on November 5, 2023. The patient was generally in good condition, with no epilepsy and mental development disorders, non-closely related married parents, and no history of similar diseases in the family. And with the physical examination was performed, we did not find abnormality in other systems. And the patient self-reported a local yellowish patch on the scalp with no hair on the surface. Thereafter, the skin lesions slowly expanded with age and were slightly raised. More than 10 years ago, red papules and pustules began to appear on the surface of the skin lesions, accompanied by pain. After the dermatological examination, we could see an irregular light-yellow plaque (about 15cm x10cm) at the back of the head, with clear boundary and the surface is uneven papilloma, slightly hard texture, mild tenderness, sparse hair; particularly, a little pus overflow can be seen after local compression (Figure 1).

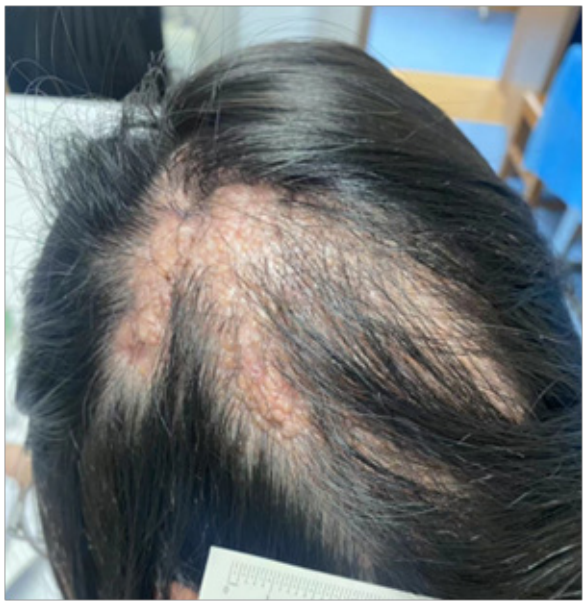

Figure 1: An irregular yellowish patch of about 15cm x10cm is seen at the back of the head. The boundary is clear, the surface is uneven and papillomatous, the texture is slightly hard, and there is mild tenderness. The hair on the surface is sparse.

The local hospital gave Benzalkanine solution, oral Amoxicillin and Yiqing capsules, and Sulphadiazine zinc cream external coating treatment, however, the effect was not satisfactory in terms of those papules and pustule occurred repeatedly, during which the original yellowish plaques never resolved. And in the past 2 years, the frequency of painful papules and pustules has increased to 1-2 times a month, sometimes concomitant with spontaneous pus. Then, we collected the skin for histopathological examination, and the results showed a clear intradermal nevus and hair follicle funnel cyst, mild hyperplasia of the epidermis, extension of the skin process, reduced units of hair follicle appendages in the dermis, nevus cells nesting or scattered in the dermis to the subcutaneous fat layer, some nevus cells distributed around blood vessels and appendages, and focal ossification in the lower part of the lesion (Figure 2-4). Combined with the clinical and histopathological examination results, she was diagnosed

as congenital pigmented nevus with ossification (Nanta nevus) and gave surgical resection.

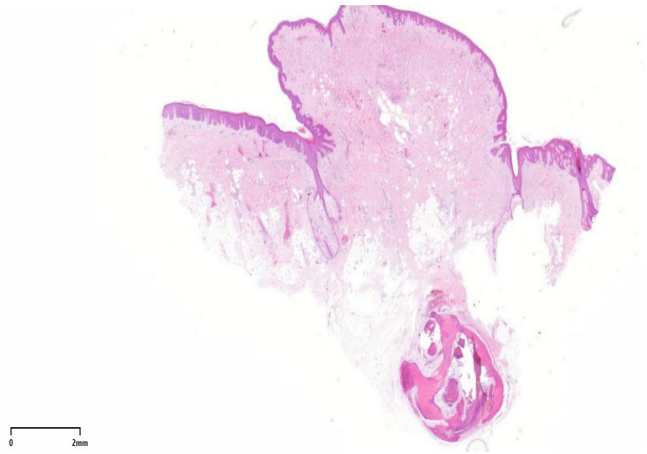

Figure 2: Mild epidermal hyperplasia with scattered or nested nevus cells from the dermis to the subcutaneous adipose layer, accompanied by neuronal differentiation of nevus cells and adipocyte metaplasia, and focal ossification below the nevus. Hematoxylin-eosin, original magnification ×20.

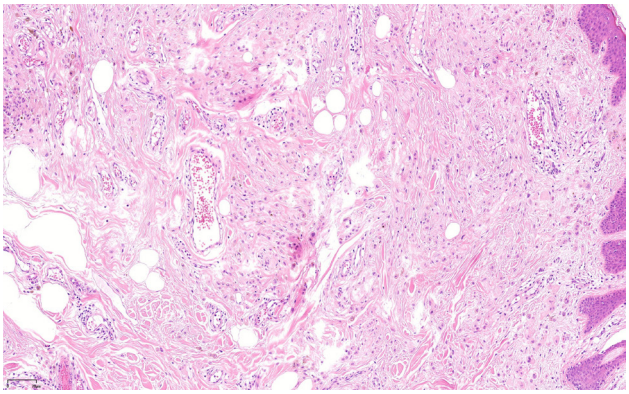

Figure 3: Scattered or nested nevus cells from the dermal to subcutaneous adipose layer, accompanied by neuronal differentiation of nevus cells and interadipocyte degeneration. Hematoxylin-eosin, original magnification ×100

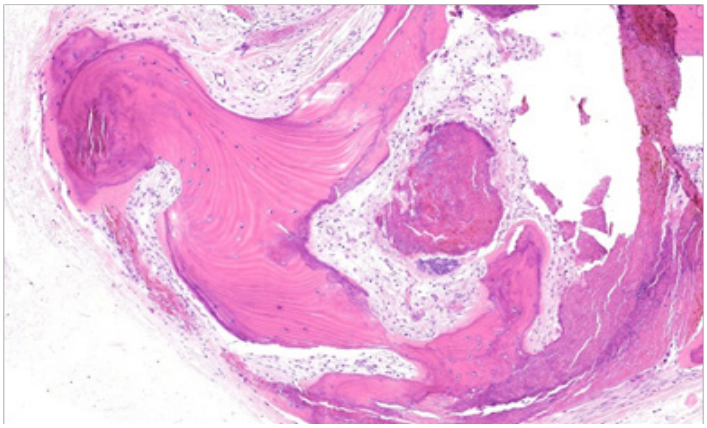

Figure 4: Focal ossification below the nevus. Hematoxylin-eosin, original magnification ×100.

3. Discussion

According to the literature, Nanta nevi are mostly located in the head, face and neck, and the lesions usually present as hard, domed, or pedicled asymptomatic papules or nodules, which are more common in adult women, but a small number of pediatric cases have been reported for [7]. Its histopathological features are the ossification in or directly below the nest of nevus cells [8], and the intradermal nevus is more common [9]. In our case report, the sex, site of onset, and histopathological findings of the patient were consistent with the literature data, but the area of skin damage was much larger. Some scholars have studied and discussed the dermatoscopic characteristics of Nanta nevus [6,7,10], and no consensus has been reached. The exact mechanism by which ossification occurs in Nanta nevus is currently unknown. Several hypotheses have been proposed to explain this phenomenon, and one of the views is that there is metaplasia of bone, with chronic inflammation, repeated trauma, or melanocyte proliferation inducing the differentiation of dermal fibroblasts into osteoblasts [4]. A case study by Keida [11] et al. showed that TGF- β and CTGF play an important role. Conlin et al. believe that the important role of estrogen in bone formation can explain the higher incidence in women [1], but some scholars disagree with this [7]. Another view is that it is a hamartomatous change, pointing to the presence of mesenchymal stem cells (capable of differentiating into osteoblasts) at abnormal sites, and the expression of both mesodermal and ectodermal structures, which ultimately leads to the formation of hamartomas [4]. A new perspective, as recently proposed by Daniela et al, considering that the occurrence of ossification into the osteo-nevus of Nanta may be explained by the multidirectional differentiation of a common precursor cell, originating from the cephalic neural crest, into both facial melanocytes and osteocytes. [12]

Compared with previous reports in the literature, our cases showed larger skin lesions, manifested as huge pale-yellow plaques, superficial papilloma, and no significant melanocytic nevus, which brought some challenges to the diagnosis. Clinically, it is necessary to distinguish with sebaceous nevus, sebaceous nevus mostly occur shortly after birth or at birth, most commonly in the scalp and face, mostly solitary light-yellow plaques or nodules, papilloma-like bulge on the surface, histopathology can be confirmed by examination. In conclusion, Nanta nevus is an unusual phenomenon with heterogeneous clinical manifestations, its pathophysiological mechanism still needs to be fully studied, histopathological examination is still the gold standard for diagnosis, dermatoscopy can provide some interesting diagnostic information, and its diagnostic characteristics need to be continuously summarized and improved. Nevertheless, it would be of great significance for the development of effective treatments if cellular and molecular mechanisms could be fully investigated.

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