

## Solitary Benign Cephalic Histiocytosis in a Taiwanese Infant

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### Abstract

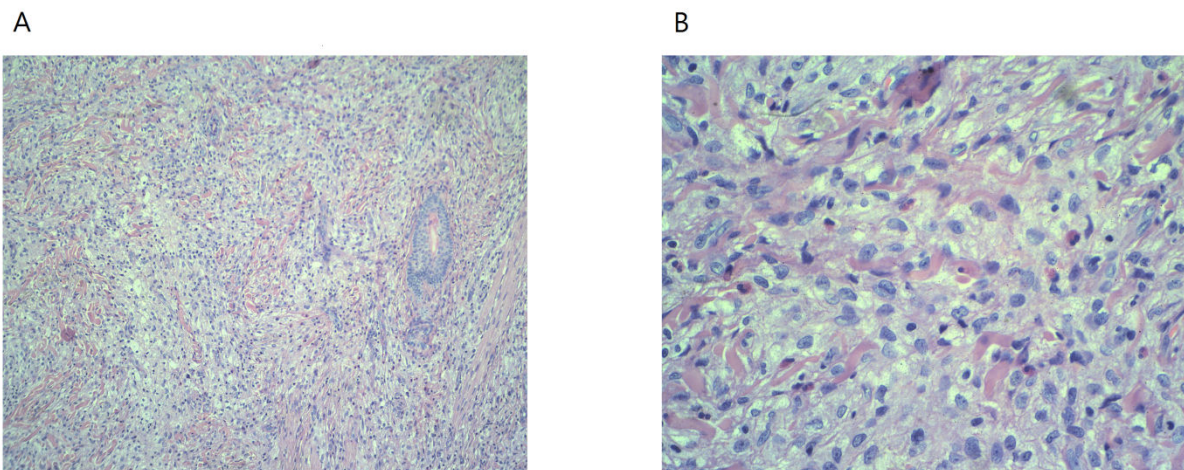
Benign cephalic histiocytosis (BCH) is a rare type of non-Langerhans histiocytosis with features of many small yellow, yellow-red, or yellow-brown papules located on face, head, neck, and shoulders of infants and young children. There would be no associated symptoms. The histopathological images reveal infiltration of histiocytes in dermis; immunohistochemically, the histiocytes are positive for CD68 stain, but negative for S-100 and CD-1a stain. The BCH would regress spontaneously with time, and thus no treatment is needed. However, in some cases, there would be some pigmentation or atrophic scar remained. This is such a rare disease, and thus there is no case of BCH been reported in Taiwan. We recently have a chance to observe an 11-year-old boy with a solitary papule of BCH on his right scalp.

**Keywords:** Histiocytosis; Non-langerhans-cell; Immunohistochemistry; Remission; Spontaneous

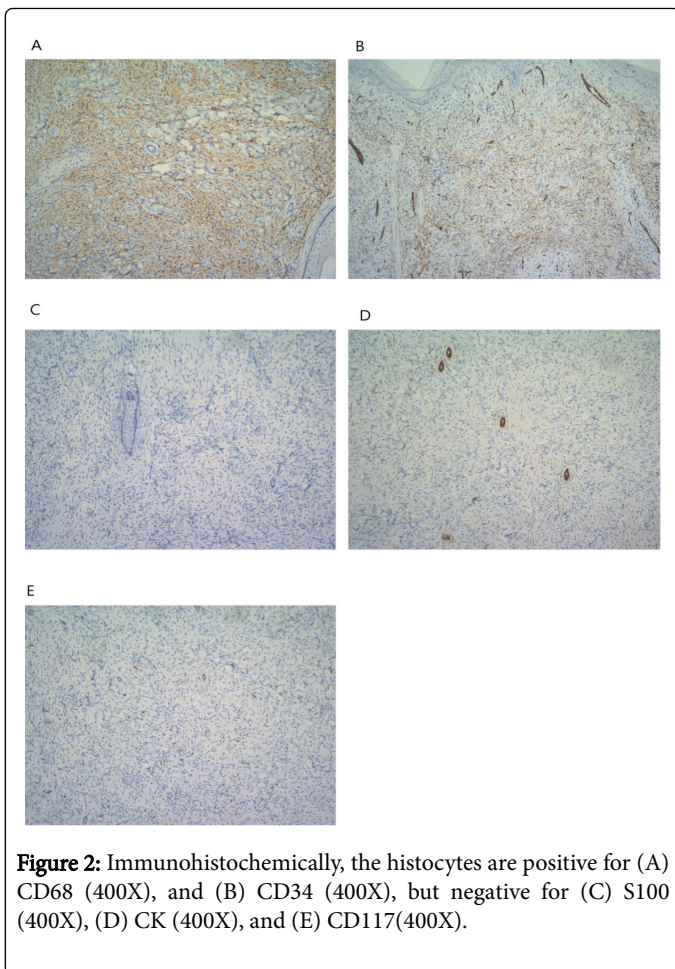
### Introduction

Benign cephalic histiocytosis (BCH) is a rare type of non-Langerhans histiocytosis first reported by Gianotti et al. [1] in 1971. It is characterized by many small yellow, orange-red or red-brown papules located on the head, face, neck and shoulders of infants and

young children who are before three years of life. BCH is a self-limiting disease which may regress spontaneously with only some post-inflammatory brown pigments [2] and atrophic scars [3] remained. The histopathological pictures of BCH reveal dermal infiltration by histiocyte with positive staining for CD68, but negative for S-100 and CD-1a. It is such a rare disease and thus there is no case reported in Taiwan before. Recently, we have a chance to observe an 11-month-old boy with BCH on his right scalp.



**Figure 1:** (A) Histopathological finding (H&E stain, X100): Ill-defined histiocytes infiltrate the superficial and deep dermis. (B) High power field demonstrating histiocytes with vesicular nuclei and fine chromatin pattern and abundant clear cytoplasm. A few eosinophils are found (H&E stain, 400X).



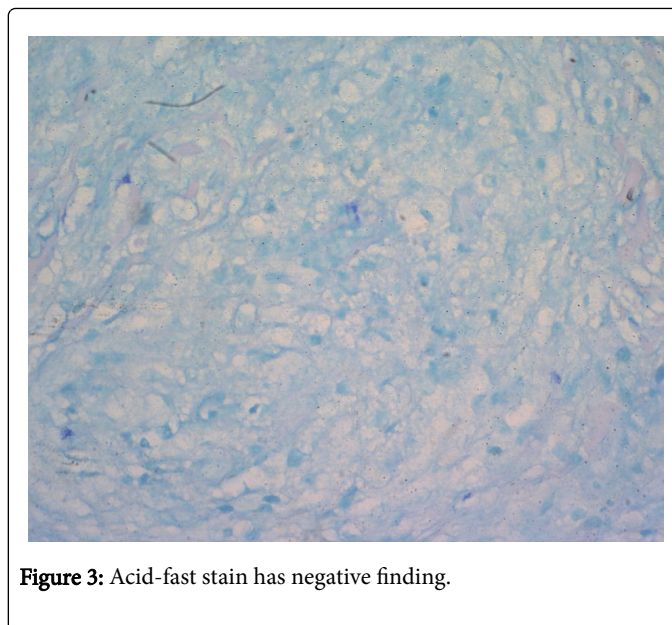
## Case Report

An 11-month-old boy visited our clinic because his mother found a palpable papule on his scalp for one month. Physical examination found a yellow and soft papule which was about 0.5 cm in size.

There were no other associated symptoms, and the boy did not have any past medical history. We thought it might be a lipoma or other benign tumor at first, and thus excision of papule was performed.

The excised specimen was submitted to the pathologist, which revealed ill-defined histiocytes infiltrated in superficial and deep dermis. The histiocytes revealed vesicular nuclei with fine chromatin pattern and abundant clear cytoplasm. A few eosinophils were also found. No multinucleated giant cell was discernible. Immunohistochemically, the histiocytes were positive for CD68 and CD34 stains, but negative for S100, CK, and CD117 stains. Acid-fast stain was negative (Figures 1-3).

At clinic follow-up, we surveyed his laboratory data, which revealed WBC: 11050/mm<sup>3</sup>; eosinophil, 7.1%; aspartate aminotransferase (AST), 45 U/L. Results of other laboratory data were normal. Abdominal echo was performed and no abnormal finding was found. Whole body bone X-ray was taken, and revealed no osteolytic change or structural deformity.



Based on the histological features and clinical data, our impression was benign cephalic histiocytosis. Thus, we did not give any medical intervention. There was also no recurrence noted.

## Discussion

BCH is a kind of non-Langerhans histiocytosis. The typical clinical characteristics are yellow-brown, asymptomatic papules on the head, neck, and shoulders. It often invades only dermal area, and there is less possibility of systematic involvement. However, there are some reports that BCH may be associated with diabetes mellitus [4] and diabetes insipidus [5], which are worth notice. According to a review article by Patsatsi et al. [6] in 2013, which reviewed 55 cases and they found that the mean age at BCH onset was  $13.1 \pm 14.3$  months, and the time until spontaneous regression was within a mean of  $43.8 \pm 29.3$  months. After the papules regress, there may be some brown pigment remained.

The diagnosis of BCH is mainly based on biopsy. The histopathological features of BCH are infiltrations of dermis by histiocytes. Sometimes, there are few eosinophils and lymphocytes can be found. The immunohistochemical staining of lesion cells reveals positive for CD68, factor XIIIa, and fascin, but negative for CD1a, langerin and S100. However, there are two references report that immunohistochemical staining of histiocyte showed S-100 positive for BCH [6,7]. Another recent report showed that histiocyte express the 150-kDa glycoprotein CD11c, which is a 150-kDa glycoprotein, a member of the alpha subunit of the  $\beta 2$  integrin family with coexpression of CD11a (lymphocyte function-associated antigen 1) [8].

The differential diagnosis of BCH includes Langerhans cell histiocytosis (LCH), the micronodular form of juvenile xanthogranuloma (JXG), and generalized eruptive histiocytosis (GEH) [7,9,10]. All of these four diseases show immunohistologically positive for CD68 stain. Among the diseases above, BCH, JXG, and GEH are all non-Langerhans cell histiocytosis which can be differentiated from LCH by S-100 and CD-1a stain. The LCH will show immunochemically positive for S-100 and CD-1a, but non-Langerhans cell histiocytosis will not. Besides, LCH is a more invasive disease,

which may invade bones, skin and liver, causing different symptoms and signs.

Among non-Langerhans cell histiocytosis, GEH is similar with BCH in histopathological finding. However, GEH often occurs in adults, and the distribution of lesions is more extensive, even in mucosal area occasionally. JXG shows different microscopic pictures from BCH. Histopathological pictures of JXG are that lipid accumulates in histiocytes, and there would be abundant foamy cells, and Touton giant cells can also be noted.

Recently, there are some opinions that BCH, GEH, and JXG are the same disease with different clinical presentations [7,9,11]. There were two infants reported about cases with transformation of BCH lesions into JXG, aged 6 months, and 1 year [12,13]. In addition, there was a case reported about a boy with disseminated JXG and BCH at the same time [9]. A blinded histologic study showed no differences between BCH, GEH, and early nonxanthomatous JXG [2] also supported these opinions. In any case, the pathogenesis and etiology of BCH are still unclear, and thus more researches are needed.

One of the most different things about the case reported in this article is that the infant in this report only had one solitary papule on the scalp. Thus, if only one papule presents, the possibility of BCH should also be taken into consideration although it is so rare.

BCH is a rare type of non-Langerhans cell histiocytic disorder which is self-limiting and often shows improvement within several months or years. It often affects infant and children before three years of life. It seems to be misdiagnosed and underrecognized most of time in the past. Although there are few cases of diabetes insipidus or insulin-dependent diabetes mellitus in BCH patients, most BCH patients still have good outcomes. The eruptions regress spontaneously in most patients and complete regression occurs in an average of 50 months, and generally no treatment is required for BCH [6,7] Thus, distinguishing it from other diseases is important. Once the BCH is diagnosed, the natural course of BCH and the possibility of post-inflammatory pigmentation remained on faces should be explained to the patient and their parents. It may be the most concern of them.

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