

Langerhans Cell Histiocytosis Presenting As A Scalp Abscess: A Case Report

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Langerhans cell histiocytosis is a proliferative histiocytic disorder of unknown cause originating from dendritic cells. Its diagnosis requires a high index of suspicion, tissue sampling, and special staining. The authors report a case of Langerhans' cell histiocytosis in a 2-year-old girl, presenting as a scalp abscess and diffuse dermatitis. Further evaluation revealed osteolytic changes of the cranium with biopsy showing malignant cells. Wide excision of the scalp mass was done and reconstructed with a scalp flap. She was managed postoperatively with systemic chemotherapy and is presently without any symptoms. Due to the diverse manifestations and the possibility of multisystem involvement, a thorough evaluation of a diagnosed patient is necessary for appropriate treatment.

Key words: Langerhans cell histiocytosis, scalp

Langerhans cell histiocytosis (LCH) belongs to a group of disorders where the common primary event is the accumulation and infiltration of monocytes, macrophages, and dendritic cells into the affected tissues. It is a disorder of antigen presenting cells. Its clinical presentation varies greatly, with symptoms ranging from mild to severe. Due to the relative rarity of the condition, the diagnosis is often delayed or missed. The pathophysiology of LCH is not well understood and an optimal therapeutic strategy has yet to be established.^{1,2,3}

Objectives

1. To discuss a rare proliferative disorder presenting as a diagnostic dilemma.
2. To discuss possible differential diagnoses

3. To discuss modes of diagnoses as well as methods of treatment and prognosis.

The Case

This is the case of A.D., a 2 year old female, who was admitted for a non-healing wound at the right occipital area.

Sixteen months prior to admission, she developed a 6cm x 6cm round erythematous, soft, non-tender mass at the right occipital area and was treated with Cloxacillin at a local health center but was non-compliant. Persistence of the non-healing wound prompted consult at UST OPD. She was noted to have developed scaly erythematous seborrhoea-like, brown to red papules over the scalp and trunk. She was seen at the Dermatology out patient department and the assessment was seborrheic dermatitis. She was prescribed Benzakolium Cl + Salicylic Acid + Tar (Ionilt, Galderma, Switzerland) shampoo and was likewise referred to Pediatric Surgery for the non-healing wound. She was admitted with the impression of chronic abscess. An incision and drainage revealed a 3cm x 2cm soft, friable, oval, nodular mass over the right occipital area extending down to the pericranium. The underlying bone was soft. Culture and sensitivity of the aspirated fluid from the mass grew *Staphylococcus aureus*. She was then treated with oxacillin and was eventually discharged stable. The patient was then lost to follow-up.

Interval history revealed non-healing wound with pus intermittently draining from it. No consultation was done nor medications taken.

One month prior to admission, the mother noted blood draining from the non-healing wound. The patient was then brought for consult. Incisional biopsy revealed abscess with granulation tissue. Skull x-ray showed soft tissue swelling in the occipital region associated with adjacent osteolytic changes of the occipital bone (Figures 1a and 1b).

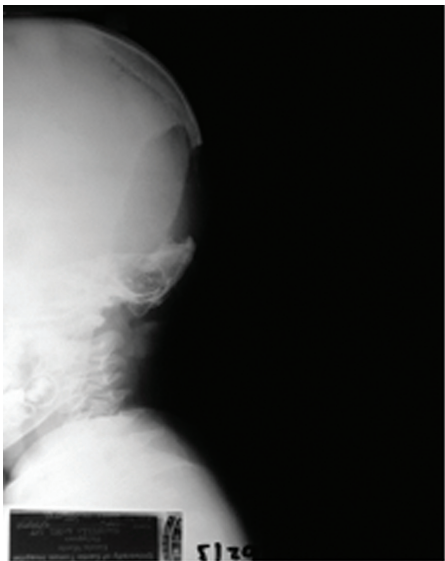


Figure 1a.



Figure 1b.

Figures 1a and 1b. Skull x-ray showing lytic changes of the occipital bone.

Cranial CT scan was then done, which revealed a hypodense lesion in the right occipitoparietal scalp with almost complete destruction of the adjacent calvarium with moderate enhancement of the mass (Figure 2). Osteolytic changes were also seen and the possibility for a vascular tumor was not totally ruled out.

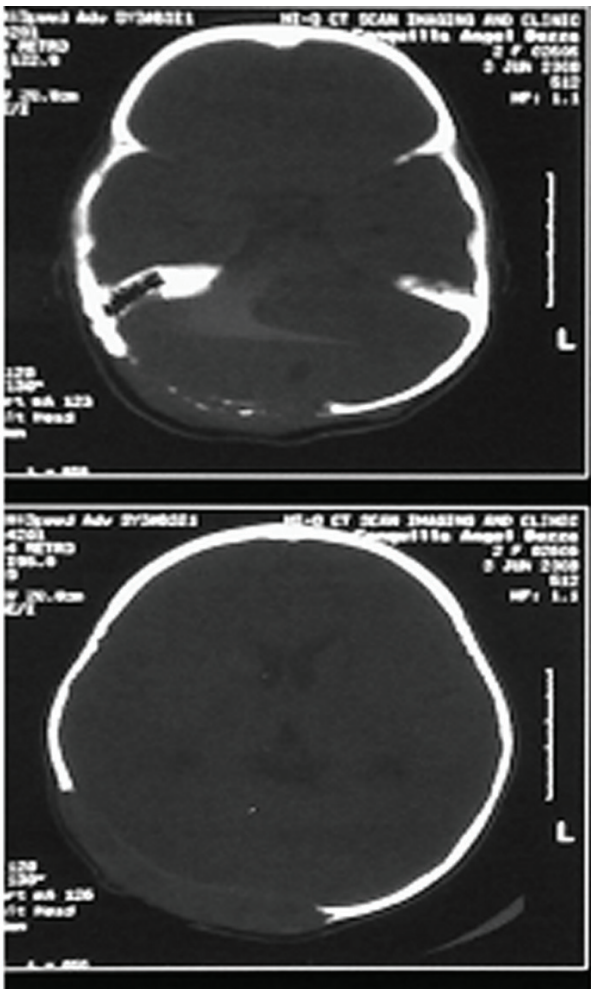


Figure 2. Cranial CT scan revealing hypodense lesion at the occipitoparietal area.

Admission was advised for further work-up. Physical examination showed warm moist skin, erythematous, moist plaques with scaling and crusts over the scalp and a 3cm x 3cm open wound with blood draining from it (Figure 3).



Figure 3. Ulcerating mass over the right occipitoparietal area with granulation tissue and serosanguinous drainage.

Wide excision of the scalp mass was done with rush frozen section due to the suspicion of malignancy. The frozen section biopsy revealed malignant cells. We then proceeded with a craniectomy of the underlying lytic bone (Figures 4a & 4b) and a rotational scalp flap for reconstruction (Figure 5). The postoperative course was unremarkable and she was discharged stable. The final histopathologic report showed round and spindle cell neoplasm positive for CD1a, vimentin, and S-100, and negative for cytokeratin. These were all consistent with the diagnosis of Langerhans cell histiocytosis (histiocytosis x).

Postoperatively, the patient was referred to hematology and was treated with systemic chemotherapy. The patient is presently asymptomatic and improved.

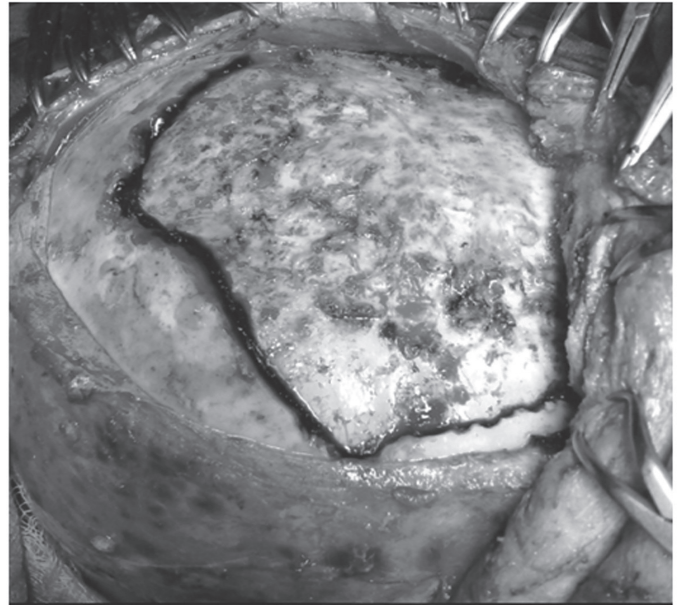


Figure 4a

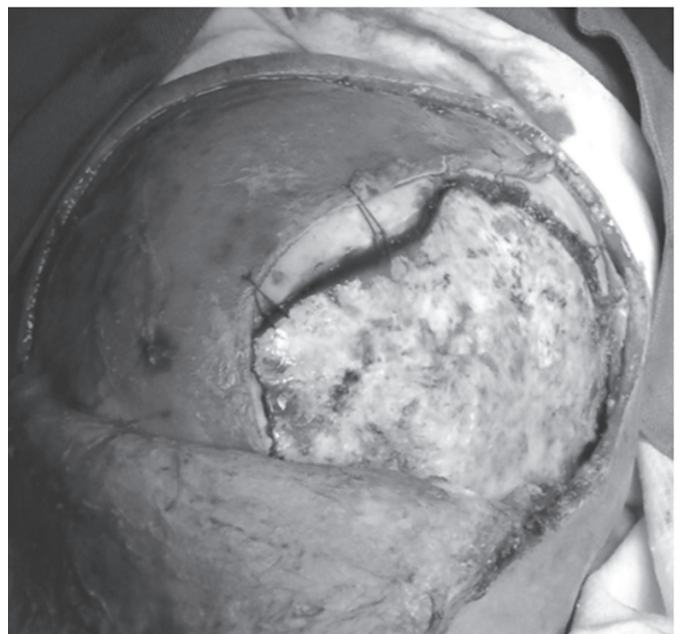


Figure 4b

Figures 4a & 4b. The cranial defect after wide excision of the scalp mass and removal of all lytic bones.

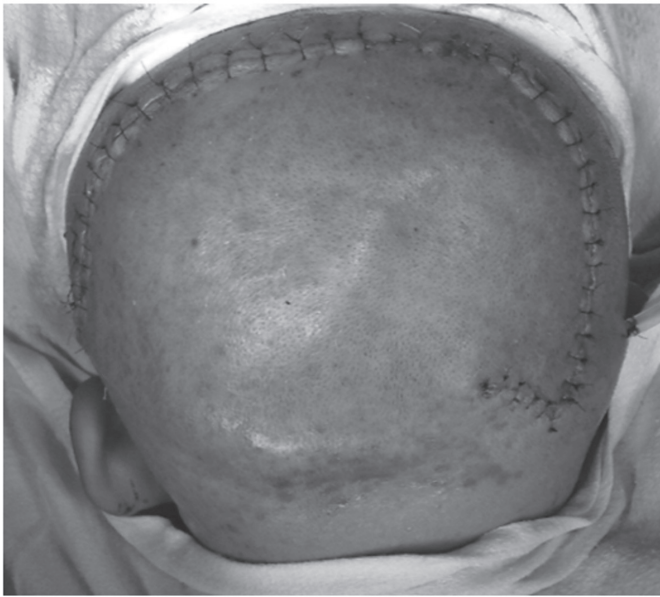


Figure 5. Rotational scalp flap reconstruction for the soft tissue defect.

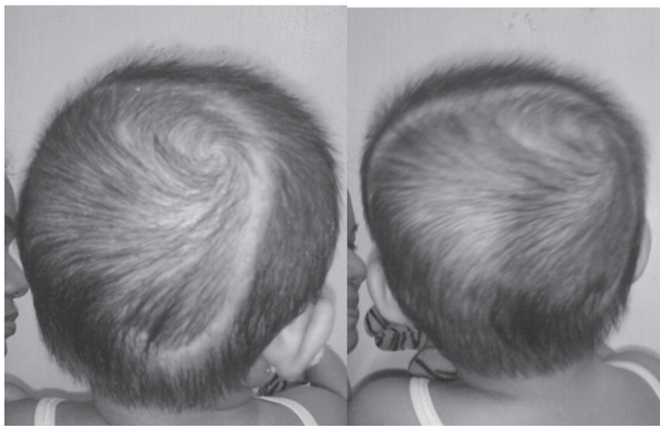


Figure 6. Month after the operation.

Discussion

The first report of the disease was made in 1865 when Thomas Smith described the case of a child with impetigo and osseous lesions in the cranium.¹ In 1953, Lichtenstein gathered the several clinical forms under the name Histiocytosis X.⁴ This was later modified to Langerhans cell histiocytosis in 1973 by Nezelof.¹

Histiocytosis syndrome is a group of disorders of unclear etiology and pathogenesis. These disorders have in common the proliferation of cells of the mononuclear phagocyte system and the dendritic cell system.⁵

Most cases occur in children one to three years of age, although it may occur at any age. Its annual incidence is between 2 to 5 cases per million and it is twice more common among males.⁶

The Histiocyte Society has established criteria required for the histologic, histochemical, and electron microscopic diagnosis of LCH. Characteristic pathologic findings include a large cell with fairly abundant eosinophilic finely vacuolated cytoplasm and a nucleus that is indented or reniform. Mitoses are unusual. Phagocytotic activity is rare.⁷

The cornerstone of diagnosis in LCH includes identification of the characteristic clinical features, but also requires corroboration by histopathologic and immunohistochemical results.⁸ A presumptive diagnosis is possible when histological appearance of biopsy is consistent with the diagnosis of LCH. Immunohistochemical marker studies confirm the diagnosis. The Langerhans cell displays immunoreactivity for S-100 protein and the monoclonal antibody CD1a, HLADR and peanut agglutinin.^{9,10} Electron microscopy demonstrate Birbeck granules, but is not essential for diagnosis.¹¹

LCH can affect hematopoietically active bone (pelvis, femur, ribs, skull, and orbit), skin, lymph nodes, bone marrow, lungs, spleen, and liver. It may cause fever, malaise, and failure to thrive.¹² Cutaneous lesions are verified in up to 50 percent of the patients, the most common presentation of which is a rash. It may be the only sign of the disease or evidence of multisystemic involvement. The scalp has erythematous lesions that may evolve into petechiae that ulcerate and form crusts. There may be alopecia.^{1,3,12} If left alone, it may develop secondary bacterial infection and invasion into the underlying bone such as in this patient.

The clinical features of histiocytosis x depends on the site of the lesions, number of involved sites, and the extent to which the function of the involved organs is compromised. Bone involvement presents as lytic lesions that can mimic osteomyelitis and bone cysts. Cutaneous eruptions may appear as dermatitis, petechiae and

purpura, granulomas, xanthomas, or mere bronzing or hyperpigmentation. Patients with solitary disease have localized pain. Patients with disseminated disease have lymphadenopathy, skin lesions, and diabetes insipidus.¹³

Isolated "skin only" disease occur in about 10%. It presents as a seborrheic like eruption which is often initially misdiagnosed as "cradle-cap".¹⁴ It is important to note that LCH should be considered whenever a cutaneous rash diagnosed as seborrheic or diaper dermatitis fails to respond to therapy or keeps recurring.²

LCH should be included in the differential diagnosis for seborrheic dermatitis, juvenile xanthogranuloma, and xanthoma disseminatum.¹²

The outcome of LCH varies. Up to twenty percent of patients have a spontaneous regression of the disease. The main prognosticating factors are age at the time of diagnosis and the degree of organ involvement. Age younger than two years at the time of diagnosis is correlated with increased mortality rate. The presence of organ dysfunction is a poor prognostic sign, especially liver involvement.¹⁵

Minkov, et al. observed for the relationship of response to an intensive combination therapy of prednisolone, vinblastine, and etoposide and the long term survival rate. They showed that the response to initial therapy appears to be a reliable prognostic factor. This allows the physician to identify a subgroup of patients with extremely poor prognosis (mortality rate 90%) early in the disease course.¹⁶

Treatment options for LCH include phototherapy, intralesional steroids, radiotherapy, topical and/or systemic chemotherapy and surgery depending on the extent and site of disease. The extent of disease was documented by Gadner, et al. as either localized and disseminated.¹⁷ Localized disease includes single-system, single site disease (Group 1). Patients with disseminated disease were grouped into three Group A, patients with multifocal bone disease; Group B, multisystem disease without organ dysfunction; Group C, multisystem disease with organ dysfunction.

Isolated skin involvement confers a favorable prognosis.¹⁸ Topical nitrogen mustard¹⁹ as well as methyl-aminolevulinate-based photodynamic therapy²⁰ has been used for its treatment.

In a specialty center with 18 year experience of managing 69 patients with LCH, they recommend prednisolone for Group 1 patients. The main chemotherapeutic agents used are vinblastine or etoposide, with or without the addition of prednisone. Inadequate response prompted a switchover from vinblastin to etoposide and vice versa.²¹

The antimetabolite 2-Chlorodeoxyadenosine, which has activity against both resting and actively dividing lymphocytes, may be used for disseminated LCH either as frontline therapy or salvage treatment for recalcitrant cases.²²

In multisystem LCH, a subset of patients, mostly infants, progress to end stage liver, lung, or bone marrow failure. Response to conventional treatment with multimodality chemotherapy is unpredictable and is associated with toxicities, some of them severe. Monoclonal antibody therapy specifically targets LCH cells and shows promise in providing a more effective and less toxic treatment.²³

Follow up evaluation after treatment should include skeletal radiographic survey, gastrointestinal studies, MRI or CT scans based on the location and number of involved sites at diagnosis.

Conclusions

Langerhans cell histiocytosis is a rare disorder with a wide array of clinical manifestations that can easily be confused with more common and benign disorders. Acute awareness is required in making the diagnosis. It should be included in the differential diagnosis of seborrheic dermatitis and alopecia of the scalp. They are frequently difficult to distinguish on a clinical basis and requires histopathologic as well as immuno staining for definite diagnosis. The authors emphasize the important role of lesional biopsy in a child with a scalp lesion, especially if unresponsive to treatment of recurrent, to ensure appropriate treatment and improve survival.

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