LANGERHANS CELLS HISTIOCYTOSIS – A CASE REPORT

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Abstract

Langerhans cell histiocytosis (HCL) is a disease characterized by proliferation of cells belonging to the phagocyte – mononuclear cell system. HCL is a more precise term for histiocytosis X, 'X' because the exact pathogenesis and cause of the disease is unknown. In this article we present a 16 years old pacient, from rural areas that are hospitalized in our department of "Louis Turcanu" Emergency Hospital for Children Timisoara, for a tumor in the right parietal region of head, which appeared one month before admission. Results: The histopathological appearance of eosinophilic granuloma advocates for Langerhans cell histiocytosis and is confirmed by results of immunohistochemical reactions. The patient received surgical treatment consisting in ablation of the tumor until. Conclusions: The particularity of the case lies in the rarity of this disease, its unique location and a relatively short-time recovery of the patient.

Key words: histiocytosis, Langerhans cells, eosinophilic granuloma

Introduction

Langerhans cell histiocytosis (HCL) is a disease characterized by proliferation of cells belonging to the monocyte-phagocyte system. HCL term is used as a synonym for histiocytosis X. It combines several syndromes in a single entity, such as Hand-Schüller-Christian Syndrome, Letterer-Siwei disease, eosinophilic granuloma, Hashimoto-Pritzker Syndrome, purely cutaneous histiocytosis[1]. The annual incidence of this disease is estimated at about four cases per 1 million, predominantly for males. This disease can affect any age group, but most cases occur during childhood and the average age at diagnosis being 2-3 years. In general, the acute forms occur before the age of 3 years, and about half of the cases of bone lesions occur before the age of 5[2,3]. The first case was published in 1893 by Hand. In 1921, Hand reported 6 cases with bone lesions, exophthalmia and polyuria. Subsequently, Letterer (1924) and Siwe (1933) described several cases with fever, hepatomegaly, adeno-splenomegaly and bone injuries, with fatal outcome. At autopsy examination were discovered massive histiocytic infitrate. In 1942 Farber describes eosinophilic granuloma of bone. Langerhans cell histiocytosis term was introduced in 1985 and reflects the essential role of these cells in disease pathogenesis[2,3].

In histopathological terms, the lesion is represented by granulomas consisting of histiocytes, lymphocytes, eosinophilic cells, neutrophilic cells and plasma. The histological appearance varies according to the different disease stage and location. The initial proliferative lesion consists mainly of histiocites without a histological criteria of malignancy. Sometimes mitotic figures can be identified in the cytoplasm. A low percentage of histiocites is represented by abnormal Langerhans cells[4,5]. As the lesion progresses, the granulocyte infiltration is dominated by eosinophils and areas of necrosis may occur. During the late stage, histological fibrosis and xantomatosis changes are predominant and the Langerhans cells disappear. Multinucleated giant cells can sometimes be seen in the bone or lymph node areas. The identification of those Langerhans cells, which is considered a pathognomonic sign, can in most cases be done by electron microscopy.[6,7,8]

Some immunohistochemical features for Langerhans cells, whether normal or pathological, is the existence of a positive CD1 antigen, S100 protein and the antigen 1a. In the clinical appearance, the most common areas of these cells include: skull, long bones, pelvis, ribs and vertebrae. These osteolytic lesions may be accompanied by pain, swelling of local tissues, fractures (if an affected bone) or they can be asymptomatic. If the location is the skin, the lesion is common in the acute disseminated forms.[7] The rash may be papular-crusted, scaly or pustulo-vesicular and it is often confused with seborrheic dermatitis. In cases of dermatitis, which do not respond to the treatment, a HCL should be suspected. Skin areas of common interest are: scalp, folds of flexion, trunk and postauriculara region. Lesions may be generalized in advanced stages. Diabetes insipidus is the most common associated endocrine disease. Although, for a definitive diagnosis, histopathological studies, including Birbeck granules and CD1a antigen are needed.[9,10]

Case presentation

Patient, R.I., 16 years old male, was admitted in our hospital for: tumor in the right parietal bone, with all common signs of local inflammation, including redness, heat, pain and swelling. We noted that the onset was sudden, about a month ago, with local inflammatory signs and a tumor in the right parietal fossa.

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The family and personal history, both physiological and pathological, are insignificant. During hospital admission, the physical examination revealed a good general condition, the patient was afebrile and had a good appetite. The inspection of the parietal region revealed that the tumor is soft, elastic, about 3/2 cm, painless on palpation. The laboratory investigations showed a slight increase in Hgb (14.6 g/dl), elevated creatinine (53mg/100ml), increased uric acid (37mg/100ml) and increased alkaline phosphatase (158UI). The radiological examination (Fig.1) of the skull could identify lack of bone tissue, oval, 3/2 cm, well defined, with a moderate osteosclerotica form located in the right parietal fossa. NPI evaluation observed defects of the bone in the right parietal region and no signs of neurologic impact (ataxia, paralysis, paresthesia), the recommended affiliating treatment consisting of: Vitamin C 3x 1 capsule/day, Vitamin B6 (250 mg), following the 0-1-0 scheme, and Tarosin 3x 1 capsule/day. The thoracic radiograph did not reveal anything pathological. The positive diagnosis is supported clinical and through the laboratory findings, especially the histopathology one. A unifocal bone disease, as in this case, most often heal with or without treatment. Very rarely there is an indication for the progression of the bone lesion or for the recurrence in the other bone sites. After initial location, no other systemic relapses were reported. The differential diagnostic is made with the acute or chronic osteomyelitis, multiple myeloma, bone cyst, bone tuberculosis, malignant bone tumors or other tumors. Generally, the treatment is surgically and in this case, it consists in removal of the tumor up to the growth defect. The necessary biopsy material was collected. After the surgery was established, the patient had to undergo analgesic and anti-inflammatory treatment. The early diagnosis increases the chances of healing and ensures a good result (Fig. 2).

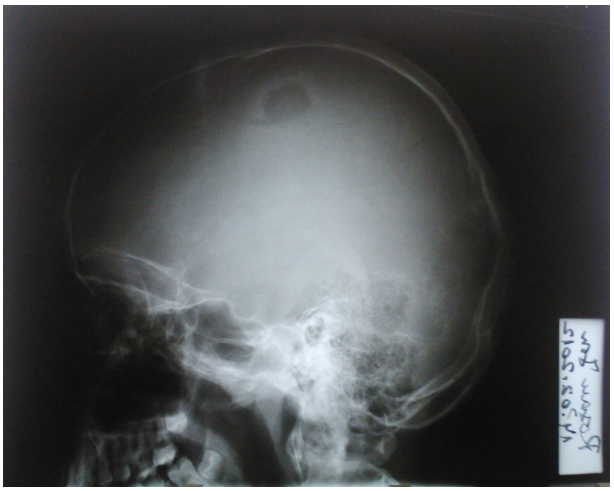

Fig. 1. Skull x-ray could identify lack of bone tissue, oval, 3/2 cm, well defined, with a moderate osteosclerotica form located in the right parietal fossa.

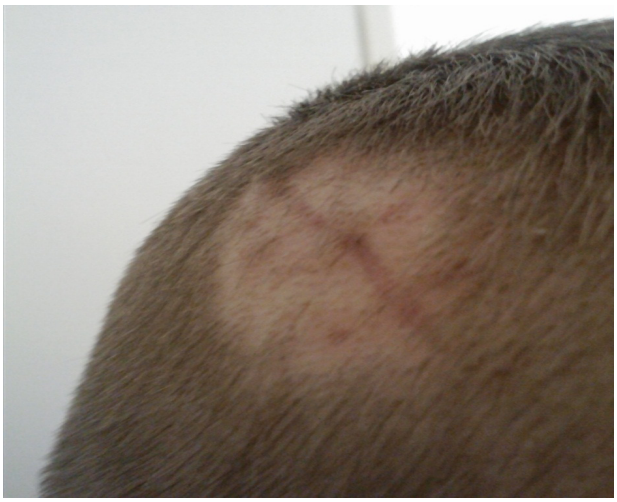

Fig. 2. Clinical appearance one month after treatment. This case has received radical surgical treatment without the need for adjuvant therapy due to its clinical and histopathological particular form; healing took place without any complications and sequelae.

Prognosis: In case of a multifocal onset of the disease, the evolution is chronic and the relapse can be unique or multiple. In these cases, the major risk of recurrence is 60% between 1 and 4 years, 20% in the first year after finding the diagnosis and 15% over four years[11]. The sequelae, which occure more frequently, are: diabetes insipidus, dental disease and chronic media otitis. Time, age, organ dysfunction and extent of the disease are always considered important factors for the prognosis[12]. The invaded organ, which is dysfunctional, is a prognostic factor. Cytopenia, secondary to medular and liver invasion, related to jaundice is associated with a high mortality rate. If the localizations are exclusively bone or skin, whether they are single or multiple, the prognosis is extremely good. Complications: anemia due to bone marrow infiltration, damage to the pituitary gland, causing growth deficiency, diabetes insipidus, lung problems, which may progress to severe breathing difficulties.[13]

Discussions and Conclusions

The early diagnosis of Langerhans cell histiocytosis is extremely important, especially in the acute form, because of the successful treatment, which depends on the moment of the diagnosis.

The positive diagnosis of the histiocytosis requires full clinical observation and histopathological examination. Currently, the immunohistochemical techniques give a certain diagnosis by showing the S100 protein, antigen CD1a, and Langerin in the histiocite belonging to the characteristic proliferative disease.

Sometimes, there is a discussion about the fact that the two clinical forms, the localized one and the disseminated form, received the generic name of histiocytosis and that because of the emphasis in both cases of the Birbeck granules, visible in electron microscopy and specific markers (immunohistochemical techniques)[14].

We reviewed this case because of the rarity of the disease, the unknown etiology and because the recovery was made in a relatively short period of time.

We all need to know that the symptoms are different in Langherhans cell histiocytosis (depending of its localization) and the prognosis depends on the patient's age and the number of the affected organs.In this disease there may be a single organ or system affected, but there are cases in which several organs and systems are affected, that may cause their dysfunction. The diagnosis always depends on the histopathological outcome and generally the treatment is surgical.

References

1. Baumgartner I, von Hochsstetter A, Baumert B - Langerhans cell histiocytosis, Med PediatrOncol, 1997, 28, 9-14.
2. Bery DH - Histiocytosis X in bone only, Med PediatrOncol, 1990, 18, 292.
3. Ceci A, de Terlizzi M, Toma MG, et al. Heterogeneity of immunological patterns in Langerhan'shistiocytosis and response to crude calf thymic extract in 11 patients. Med PediatrOncol. 1988;16(2):111-5.
4. Nieuwenhuyse JP, Clapuyt P, Malghem J - Radiographis skeletal survery and radionuclide bone scan in Langerhans cell histiocytosis of bone, PediatrRadiol, 1996, 26, 734-8.
5. Yu RC, Chu C, Buluwela L - Clonal proliferation of Langerhans cells in LCH,Lancet, 1994, 343, 767-768.
6. Chu T, Jaffe R - The normal Langerhans cell and the LCH cell,Br J Cancer, 1994,70 (23), S4-10.
7. Degar B., Flemming M., Rollins BJ.- Histiocytoses, Oncology of Infancy and Childhood, chapter 24, Orkin et al., Saunders-Elsevier, Philadelphia, 2009: 964-984
8. Egeler RM, Neglia JP, Puccetti DM - Association of Langerhans cell histiocytosis with malignant neoplams, Cancer, 1993, 71, 865-73.
9. Favara BE, Jaffe R - The histopathology of Langerhans cell histiocytosis, Br J Cancer, 1994, 70 (23), S 17- 23.
10. Grois N, Flucher WB, Heitger A - Diabetusinsipidus in Langerhans cell histiocytosis results from the DAL-HX 83 study, Med Pediatr Oncol,1995, 24, 248-256.
11. Hamre M, Hedbery J, Buckley I - Langerhans cell histiocytosis: An exploratory epidemiologic study of 177 cases, Med PediatrOncol, 1997, 28, 92-97.
12. Kilpatrick SE, Wenger DE, Gilchrist GS - Langerhans cell histiocytosis of bone, Cancer, 1995, 76, 2471-2484.
13. Lahey ME - Histiocytosis X, an analysis of prognostic factors, J Pediatr, 1975, 87, 184.
14. Yu Rc., Chu Ac.-Lack of T-cell Receptor Gene Rearangements in Cells Involved in Langerhans Cell Histiocytosis. Cancer, 1995, Mar.1,75: 1162-1166.

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