

A rare case report of Langerhans cell histiocytosis (Hand–Schuller–Christian disease) and review of literature

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Introduction

Langerhans cell histiocytosis is a rare disease that can present as uniorgan or multiorgan involvement. More than 60% of cases of Langerhans cell histiocytosis can present with head and neck lesions. Tissue biopsy is mandatory for confirming the diagnosis beside clinical and radiological findings.

Case report

The authors present a 9-year-old boy who initially presented with oral cavity lesion and gum swelling for 3-week period, who subsequently showed severe diffuse lung infiltration complicated with pneumothorax and pituitary stalk involvement with diabetes insipidus. Diagnosis was confirmed with oral lesion biopsy.

Conclusion

Oral lesions are easily approachable, and biopsy can be done under local anesthesia, with minor medical and cosmetic complication. Any initial aggressive surgical intervention should be avoided.

Keywords:

diabetes insipidus, langerhans cell histiocytosis, oral lesions, tissue biopsy

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Introduction

Langerhans cell histiocytosis (LCH) is a rare disease characterized by a proliferation of Langerhans cells or their precursors [1,2]. It is estimated that the disease occurs at the rate of 0.2–0.5 cases per 100 000 children per year [2].

LCH has been classified by Lichtenstein depending on the patient's age at onset and distribution of the lesions, as shown in Table 1. This distribution should be replaced with the clinical classification of the LCH study group, which divides LCH into single-system LCH and multisystem LCH: the single system is further subdivided into single site and multiple site; the multisystem in low risk and high risk, according to the involvement of some organs (liver, lungs, spleen, and hematopoietic system) [3]. This is because atypical cellular proliferation of LCH occurs in various organs and tissues, which may be the reason of different and complex manifestations. Diagnosis of LCH needs clinical, radiological, tissue biopsy, and immunohistochemical investigation [3]. Treatment is either by surgical excision, chemotherapy, radiation therapy, or combinations of these modalities.

This report describes a case of LCH of a 9-year-old boy with oral, lung, and diabetes insipidus without ocular involvement, which is a rare entity, and a review of the literatures.

Case report

A 9-year-old boy was admitted to pediatrics surgery ward owing to sudden-onset shortness of breath, generalized weakness, gum swelling with occasional bleeding, and reduced oral intake owing to pain for 3-week duration. On oral cavity examination, he had irregular swelling on both palatal and distal molar aspects of maxilla, with ulceration on center part. No teeth mobility and no purulent discharge were noticed. During admission, the child also developed polyuria and polydipsia with increased serum osmolality and low urine osmolality. One week before the admission, the child was seen in oral and maxillofacial clinic and he was being treated as having severe periodontitis.

Chest radiography (Fig. 1) showed left lobe pneumothorax and diffuse cystic changes of both lung fields. Chest computed tomography scan (Fig. 2) showed multiple diffuse irregular-shaped thick and thin-walled cystic lesions of varying size in both lung fields. The brain MRI (Fig. 3) revealed features of pituitary stalk involvement.

Based on physical and radiological finding, LCH was suspected, and diagnosis was confirmed with biopsy taken from oral cavity lesion. During admission,

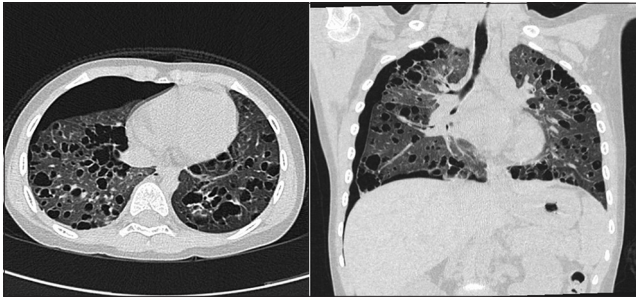
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Figure 1



Chest radiography of the child when presented to emergency department having diffuse cystic lesion with left-sided pneumothorax.

Figure 2



Multiple diffuse irregular-shaped thick- and thin-walled cystic lesions of varying size in both lung fields.

Figure 3



Sagittal contrast enhanced T1-weighted image demonstrating a significantly thickened pituitary stalk (white arrow).

chemotherapy was started according to the LCH-III protocol. Right side spontaneous pneumothorax required chest tube insertion and followed by thoracocentesis. Diabetes insipidus was managed medically. During subsequent follow-ups, the child was on maintenance chemotherapy in a regression

phase, with resolved pneumothorax, improved oral cavity lesions, and reduced pituitary stalk tumor size.

Discussion

Although LCH is an uncommon disease, otorhinolaryngologist and maxillofacial specialists need to be aware of it owing to common presentation in head and neck (H&N) region. H&N involvement is in most of the case reports (60%). Nicolas and colleagues [4] in a case series reported 73.8%, and Buchmann and colleagues [5] reported 77%. The presentation can be quite variable from mono-osteotic lesions of the skull or mandible to polyosteotic lesions with significant soft tissue involvement. Most of the case series reported skull as the most common involved structure. Oral manifestation of LCH may be the first or the only presentation with the incidence of 77% [6]. LCH has been reported in the H&N region, especially the jaws, mandible, oral cavity, and maxilla.

According to Table 1, our patient fit the criteria for Hand-Schüller-Christian disease, which is a rare disorder of childhood [7,8]. The incidence is 1 : 3 300 000 individuals [9]. The disease usually appears in the first decade of life, with no particular sex predilection [7,8]. In our case, the lesion noted to be an exophytic large ulcerative mass with an irregular surface of the palatal mucosa. Therefore, this lesion is similar to those described in the literature [10,11].

Hand-Schüller-Christian disease has been defined as a triad, comprising diabetes insipidus, exophthalmos, and bone alterations, though only 25% of patients present the full picture [8,9], and according to Garcia-Pola and colleagues [12], the complete triad is actually found in less than 10% of cases. Similarly, Minguez and colleagues observed that only in one of their patients, the full triad was identified. In our case, like the other studies, we identified two of the alterations (bone lesions and diabetes insipidus).

The cornerstone of diagnosis in LCH includes not only identification of the characteristic clinical features but also supporting histopathological and special immunohistochemical staining like S-100 and CD1a as well as demonstration of Birbeck granules on electron microscopy [3].

Treatment of LCH depends upon natural history of the disease as well as the location and extent of the lesions and degree of organ dysfunction. Occasionally, multitreatment approaches are required in response to changes in behavior of the disease [8].

Table 1 Langerhans cell histiocytosis

	Age of onset	Bone lesions	Skin or mucosal lesions	Visceral lesions	Pituitary lesions	Treatment	Prognosis
Solitary eosinophilic granuloma	>10 years	+	±	-	-	Surgery/local radiotherapy	Good
Multifocal eosinophilic granuloma (Hand-Schuller-Christian disease)	<5 years	+	+	±	+	Chemotherapy	Variable
Letterer-Siwe disease	Infancy	+	+	+	+	Chemotherapy steroid	Fatal

Table 2 Major collaborative studies in Langerhans cell histiocytosis

LCH types	year of study	Type of study conducted
DAL HX-83	1983	Risk-adaptive polychemotherapy; nonrandomized clinical trial
DAL HX-90	1990	Risk-adaptive polychemotherapy; nonrandomized clinical trial
LCH-I	1991	Randomized clinical trial comparing monotherapy chemotherapy
LCH-IS	1994	Salvage therapy protocol for refractory or progressive LCH
LCH-II	1996	Risk-stratified randomized clinical trial; multisystem LCH
LCH-CNS	1998	Registry for CNS-LCH and neurodegenerative disease
LCH-III	2001	Risk-stratified chemotherapy for multisystem LCH

LCH, Langerhan's cell histiocytosis.

The Histiocyte Society performed three major study protocols for pediatric LCH (LCH-I, LCH-II, and LCH-III) (Table 2).

The prognosis of LCH is difficult to assess as this is a rare disease with clinical variability. The most important factors that may worsen the prognosis are first, visceral involvement, as this has a negative effect on survival; second, where age at first presentation is less than two years because mortality rises to 50%; and third, when the disease spreads to various bones or soft tissues [9].

Conclusion

LCH is a rare disease but with common H&N and oral cavity presentation as an early sign. Physicians have to be aware of and not forget LCH when a child presents with long-standing oral cavity lesions. Oral biopsy is easily obtainable with low complication for confirming the diagnosis, but initial aggressive surgical intervention should be avoided.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be

reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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