LCH DIAGNOSED BY FNAC: GROWTH RETARDATION OF CHILD AND CLINICALLY MISDIAGNOSED AS MILIARY TUBERCULOSIS.

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ABSTRACT- Langerhans cell histiocytosis (LCH) is a rare disorder with multisystem involvement. Hear we report a case of LCH in a five year old child with growth retardation and scalp swelling where FNAC was helpful in achieving a rapid and accurate diagnosis despite of misdiagnosis at the clinician level. The cytological features are characteristic of LCH ie nuclear grooving, nuclear pseudo inclusion in background of eosinophils and plasma cells. This can also avoid unnecessary biopsy and guide the management. **ABBREVIATIONS:** LCH- Langerhans cell histiocytosis, FNAC- Fine needle aspiration cytology, LC- Langerhans cell, IHC-Immunohistochemistry
KEYWORDS: Langerhans cell histiocytosis, FNAC, Growth retardation

INTRODUCTION- Langerhans cell histiocytosis (LCH) is a rare disease affecting predominantly children. It can present as the solitary lesion requiring no treatment or as a multisystem life threatening disorder[1]. LCH may involve hypothalamo-pituitary axis in which diabetes insipidus is the most common endocrine abnormality followed by growth hormone deficiency. Growth hormone deficiency is the most frequent anterior Pituitary hormone deficiency among patients with LCH and pituitary dysfunction[2]. Two early findings were associated with subsequent growth hormone deficiency, first is early loss of growth velocity and second MRI documented decrease in ant. pituitary height[3]. In case of pulmonary involvement early stage pulmonary LCH can convincingly mimic miliary tuberculosis.

CASE REPORT- A Five year old male child weighing 10 KG, height 94 cm presented with chief complain of multiple small lymph nodes in cervical region, fever off and on, decrease appetite, cough and mild bilateral proptosis from last three year. After consulting to local physician, he went to higher centre where x ray and ultrasound was done. On Ultrasonography hepatomegaly and mesenteric lymphadenopathy is noted.
X-ray suggested multiple nodules are noted in lung. On the basis of x-ray, ultrasonographic finding and above symptoms case was diagnosed as miliary tuberculosis and antitubercular therapy was given for six months. Patient was initially relieved, after that complaining of fever cough and loose motion for three to four days and respiratory distress for one day then patient was admitted in ICU

for three days. After Six month patient develop swelling in right parietal region with pain which was three month before coming this institute.

On physical examination an ill defined soft tissue mass is in the right parietal region measuring 3x3 centimeters. Peripheral blood smear showed normocytic normochromic blood picture, hemoglobin 12.5 gm, differential leukocyte count- N-62, L-30, E-6, M-02 and platelet count was within normal limit. Bone marrow was performed which showed normal haematopoesis. FNAC from scalp swelling yield blood mixed material. Ethanol fixed and air dried smear was prepared and stained with pap and giemsa stain respectively. Smears are cellular and showed numerous atypical histiocytes as predominant cell types scattered singly and loosely cohesive cluster. These were admixed with polymorphous population of eosinophils, neutrophils, plasma cell and foamy histiocytes. The atypical histiocyte having large cell with moderate to abundant pale blue cytoplasm and eccentric or central round to oval vesicular nuclei, prominent nuclear indentation and groove with coffee bean appearance were observed. These cells showed mild pleomorphic nuclei with moderate amount of cytoplasm.

At this point a plain x ray was requested which showed a lytic lesion corresponding to parietal swelling. Immunohistochemistry S100 was applied which was positive in cells of interest.

DISCUSSION- LCH is a rare disease caused by abnormal proliferation of antigen presenting cell of dendritic lineage, known as Langerhans cell. It has reported incidence of 0.2-2.0 case per 100,000 children under the age of 15 years[4]. CNS involvement has been reported in 16% of cases of LCH[4]. Hypothalamic pituitary axis is the most common site of involvement in the brain. The disease has got varying spectrum ranging from single osteolytic bone lesion (eosinophilic granuloma) seen in children between 5 and 15 years of age, multisystem disease (Hand –Schuller Christian disease) with skeletal and extra-skeletal , reticuloendothelial and pituitary gland involvement seen in children 1-5 years of age to rapid fulminant cause (letterer-siwe disease) seen most commonly less then 2 year of age[5].

Traditionally the diagnosis of LCH is based on hematological and histological criteria[8]. Enough experience has accumulated in accurate radiological setting as evident from several case report and case series. Hypothalamic pituitary axis involvement show varying degree of involvement most common is diabetes insipidus and after that growth hormone involvement[3, 6]. In children, Growth hormone involvement show mainly decreased growth velocity [3].

LCH clinical manifestation is so diversified that it is easy to be misdiagnosed[7]. Pulmonary LCH is an uncommon but important cause of interstitial lung disease in adult[8]. But in children early pulmonary LCH can mimic miliary tuberculosis.

Cytological features in the presence of appropriate clinical and radiological setting as evident from several case reports and case series[9,10]. Study of these show that cytology closely reflects histomorphology. Ancillary studies may not be always necessary diagnosis in appropriate setting[11].

The classical cytologic feature include high cellularity composed of sheets and may isolated LCs seen admixed with polymorphs, lymphocyte, plasma cells, multinucleated giant cells and macrophages. The key diagnosis is to identify the LC though its characteristic features are nuclear groove and nuclear pseudo inclusion. The cytologic diagnosis may be missed due to lack of familiarity with its cytological features among pathologists or due to the lack of characteristic cytologic findings resulting form sampling error. Therefore it is prudent on the part of the pathologist to consider this diagnosis

only in an appropriate clinical and radiological setting. It is also necessary to be familiar with cytological features of other differential diagnosis.

As early pulmonary LCH may mimic miliary tuberculosis as it shows multiple diffuse nodules in lungs, we should definitely go for other symptomatology as this patient present with growth retardation due to early pituitary involvement, proptosis due to ocular involvement and scalp swelling and cervical lymph node enlargement.

It is to conclude the present case highlights the role of FNA in the diagnosis of rare disease like LCH in children having unusual clinical presentation of multisystem involvement of lungs, orbit, pituitary and skull. Because FNA is easy and noninvasive procedure and even perform in OPD setting. If children with tuberculosis like symptom with bone involvement then LCH think in mind. This can obviate the need biopsy and IHC can be performing on cell block.

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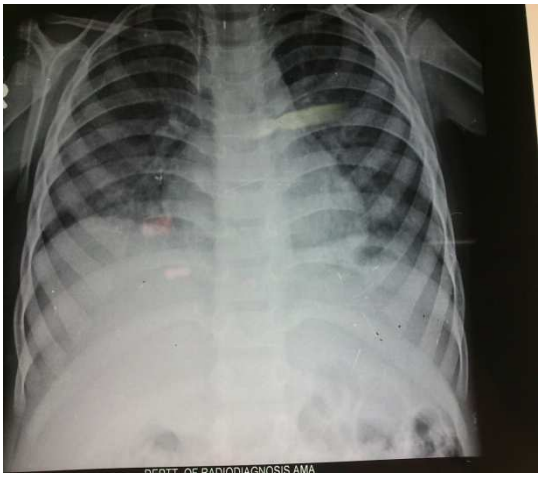

Fig 1: X-ray chest photograph of child showing haziness in lung.

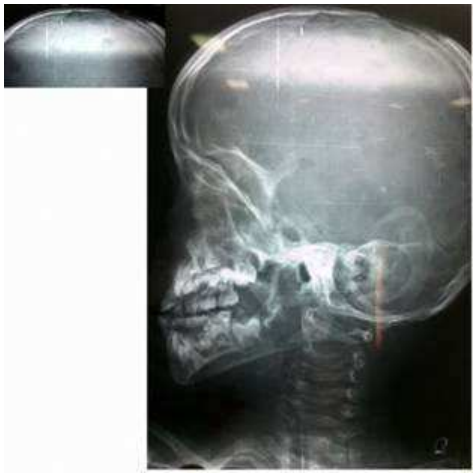

Fig 2: Digital X-ray of skull show lytic lesion in parietal region.

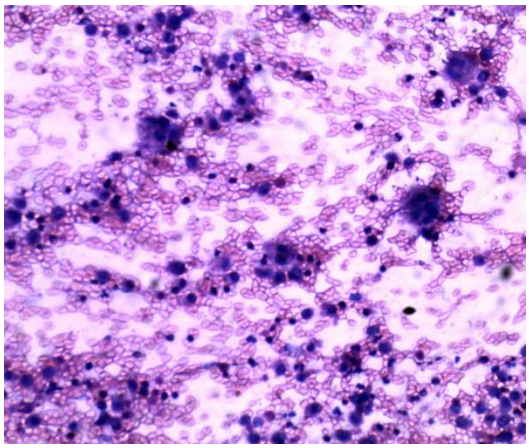

Fig 3: Hematoxylin & Eosine (10x) FNA smear from parietal swelling show Langerhans cell, multinucleated giant cell along with inflammatory cells.

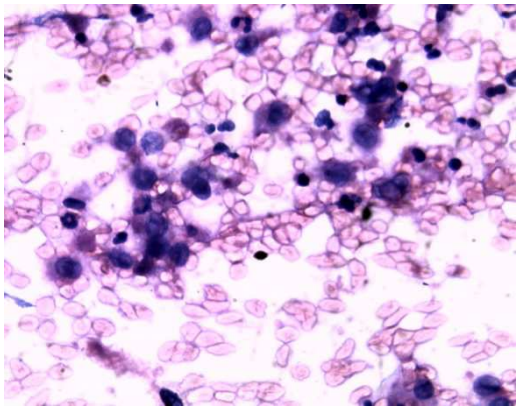

Fig 4: Hematoxylin & Eosine (40x) show Langerhans cell with nuclear groove and indentation.

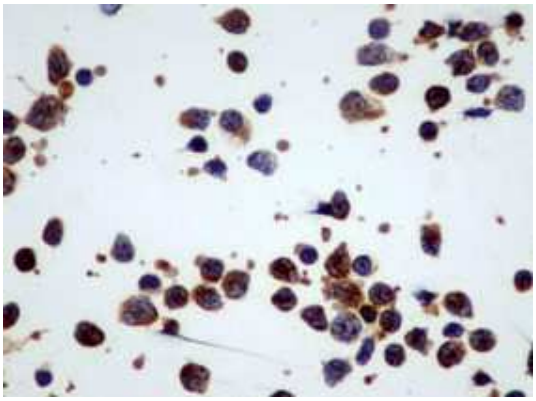

Fig 5: Immunohistochemistry of S100 showing positive Langerhans cell