Case Report

Pituitary Stalk Thickening in a case of Langerhans Cell Histiocytosis

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Abstract

A 16-year-old girl was referred for the evaluation of headache exacerbation and progressive loss of visual field from one month ago. She also suffered from intermittent diarrhea since 12 months ago and secondary amenorrhea, headache, weight loss (4 – 5 kg) and weakness from six months ago. She had a history of transient polydipsia and excessive urine output during this period. Brain Magnetic Resonance Imaging (MRI) reported a 15 x 15 x 9 millimeters mass lesion in the sellar region. It was extended to the suprasellar cistern with mild compression of the optic chiasm and mild thickening of the pituitary stalk with posterior displacement were reported. In an exisional biopsy of pituitary stalk lesion, the pathology result was indicative of Langerhans cell histiocytosis (LCH). The patient underwent four periods of chemotherapy with prednisolone and vinblastin in 28-day intervals followed by one cycle of radiation therapy. In three months follow up after treatment the tumor size was reduced, Levothyroxin and Prednisolone were tapered, and pituitary hormones were improved.

Keywords: Headache, langerhanse cell histiocytosis, pituitary stalk thickening

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Introduction

Langerhans cell histiocytosis (LCH) is a rare granulomatous disease, which is characterized by idiopathic expansion of dendritic (Langerhans) cells. It may be localized or systemic with variable clinical manifestations.[1] LCH usually involves bone, skin, lymph node, liver, spleen, oral mucusa, lung and central nervous system (CNS).[2]

LCH involve CNS in about 6% of patients at the time of diagnosis.[2] LCH can occur in all age groups, but it occurs most often between the ages of 1 – 3 years.[3] The incidence of LCH is 0.2 – 2 cases per 100,000 children under 15 years of age.[4] It may take a long time diagnosing LCH due to non-specific clinical symptoms.[1]

LCH is one of the most common etiologies of central diabetes insipidus (DI) associated with thickened pituitary stalk. By involving CNS other endocrinopathies such as hypogonadism, diabetes mellitus, growth failure and hypothyroidism may be developed.[1,5,6]

Case Report

A 16-year-old girl was referred for the evaluation of headache exacerbation and progressive loss of visual field since one month ago. She also suffered from intermittent diarrhea since 12 months ago as well as secondary amenorrhea, headache, weight loss (4 – 5 kg) and weakness from 6 months ago. She had a history of transient polydipsia and excessive urine output during this period.

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On physical examination no palpable lymph node or organomegaly were detected. Cardiopulmonary examination was normal. Pubertal staging was within normal limits.

In her previous Magnetic Resonance Imaging (MRI) which was taken 6 months ago, a mild thickening of pituitary stalk was reported. Another MRI was performed, in which a 15 × 15 × 9 millimeters mass like lesion in the sellar region with extension to the suprasellar cistern, mild compression of the optic chiasm and mildly thickening of the pituitary stalk with posterior displacement were reported (Figures 1 and 2).

To rule out the other causes of pituitary stalk thickening, other investigations were performed. Complete blood count, serum electrolytes, erythrocyte sedimentation rate (ESR), angiotensin converting enzyme (ACE) serum level, and LDH serum level were within normal limit. Chest radiograph, CT scan, and breast sonography were also normal. Anti TPO antibody measurement was negative, which rule out the autoimmune cause of hypothyroidism. In evaluating pituitary axis, all pituitary hormone levels were below the normal range. Hematologic and endocrinological data of the patient are presented in Table 1.

In 24-hour urine collection, urine volume was 6.5 litters with a specific gravity (SG) of 1.005, and DI was confirmed. She was only receiving 7.5 mg/day prednisolone since two months ago due to adrenal insufficiency.

In lumbar puncture, the analyses of cerebrospinal fluid (CSF) cytology and flow cytometry were normal, however CSF Beta Human Chorionic Gonadotropin (β-HCG), Alpha Fetoprotein and ACE were negative. Whole body bone scan was normal.

Levothyroxine was added to prednisolone. According to the rapid enlargement of the pituitary stalk, she underwent excisional biopsy of pituitary stalk lesion. In pathological examination, mixed inflammatory cells containing eosinophils, lymphocytes, plasma cells and PMN were seen along with langerhans cells. Imunohistochemistry (IHC) study was positive for S100, CD1a, CD3, CD68, LCA and Ki67.

The pathology result was indicative of LCH. The patient un-

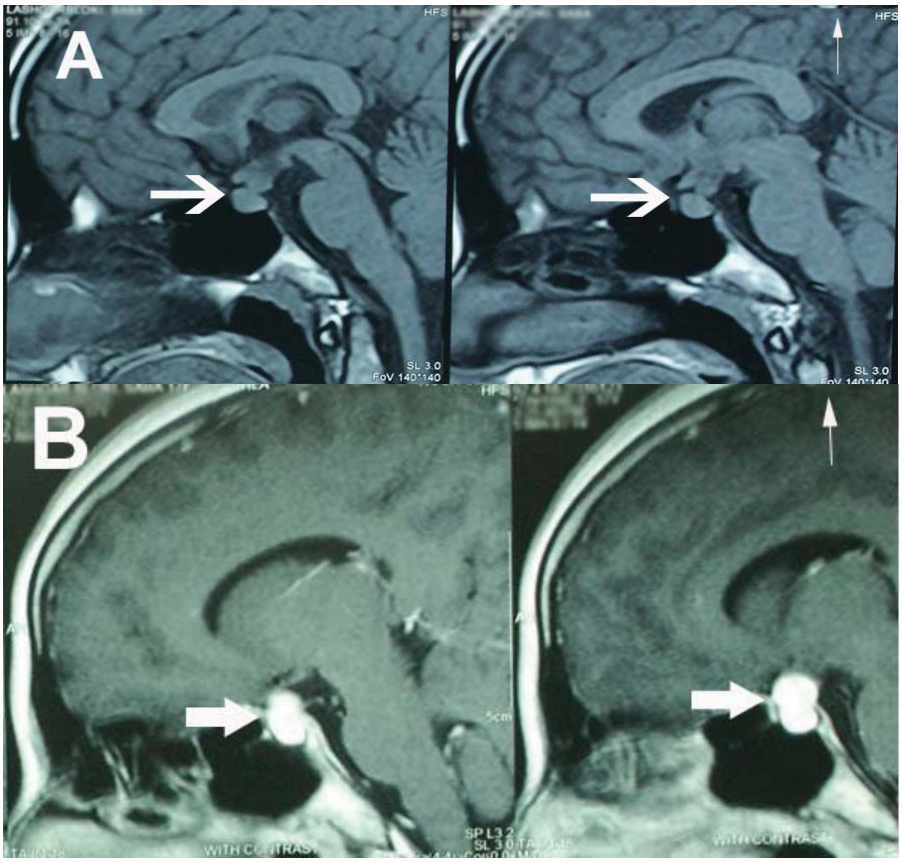

Figure 1. Sagittal view of brain MRI showing the thickening of the stalk. **A)** Without contrast; **B)** With contrast

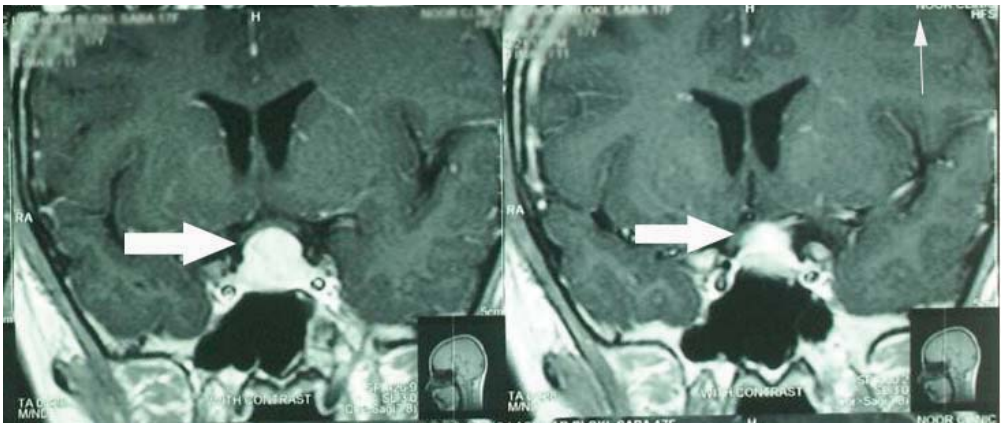

Figure 2. Coronal view of brain MRI with contrast showing the thickening of the stalk and pituitary mass which compressed optic chiasma.

Table 1. Hematologic and endocrinological data of the patient

Test	Result	Normal range
WBC	7700	4000 – 11000
Hb	13.7	12 – 16 (mg/dl)
PLT	258000	150000 – 450000
ESR	17	10 – 30
T4	4	4.7 – 12.6 (µg/dl)
TSH	0.1	0.4 – 6.2 (mIu/ml)
FSH	0.25	4 – 12 (mIu/ml)
LH	0.2	0.5 – 10.5 (mIu/ml)
IGF-1	251	267 – 470 (ng/ml)
ACTH	19.11	25 – 50 (pg/ml)
Prolactin dilutional	44	6.2 – 24 (mIu/ml)
Cortisol 8a.m	1.88	10 – 25 (µg/dl)
ACE*	22	8 – 65 (Iu/liter)
LDH**	297	Up to 350 (Iu/liter)
Anti TPO***	1.9	Up to 30 (u/ml)

*Angiotensin Converting Enzyme; **Lactate Dehydrogenase; ***Anti Thyroid Peroxidase

derwent four periods of chemotherapy with prednisolone and vinblastin in 28-day intervals followed by one cycle of radiation therapy. In three months follow up after treatment Levothyroxin and Prednisolone were tapered, the tumor size was reduced, and pituitary hormones were improved.

Discussion

LCH is a rare disease with variable manifestations. In the involvement of hypothalamic-pituitary axis (HPA), DI would be arises in up to 50% of cases.[1] Anterior pituitary dysfunction may occur in HPA involvement in up to 20% of cases[7,8] with the predominance of growth hormone (GH) deficiency.[9] Our case had panhypopituitharism in her hormonal assessment.

A health care professional should consider LCH as one of the differential diagnosis of DI and pituitary stalk thickening to avoid further complications and morbidity by early diagnosis and management. The imaging modality choice for CNS involvement diagnosis is MRI. The diagnosis of LCH is confirmed by pathological evaluation of involved tissue, especially immunohistochemical staining for CD1a and S100 protein.[10] Patients with hypothalamic-pituitary involvement are at high risk for permanent development of neurodegenerative lesions.[11] Manifestations of these lesions vary from radiologic neurodegeneration to clinical symptoms ranging from mild tremor to obvious ataxia, behavioral and cognitive dysfunction.[12] Hence, patients who develop endocrine LCH disorders should be followed for a long-time because of the high risk of developing neurodegenerative disorders.[5]

References

1. García Gallo MS, Martínez MP, Abalovich MS, Gutiérrez S, Guitelman MA. Endocrine manifestations of Langerhans cell histiocytosis diagnosed in adults. *Pituitary*. 2010; **13(4):** 298 – 303.
2. Grois N, Pötschger U, Prosch H, Minkov M, Arico M, Braier J, et al. Risk factors for diabetes insipidus in Langerhans cell histiocytosis. *Pediatric Blood & Cancer*. 2006; **46(2):** 228 – 233.
3. Broadbent V, Egeler RM, Nesbit ME Jr. Langerhans cell histiocytosis--clinical and epidemiological aspects. *The British Journal of Cancer Supplement*. 1994; **23:** S11 – S16.
4. Prayer D, Grois N, Prosch H, Gadner H, Barkovich AJ. MR imaging presentation of intracranial disease associated with Langerhans cell histiocytosis. *American Journal of Neuroradiology*. 2004; **25(5):** 880 – 891.
5. Donadieu J, Rolon MA, Thomas C, Brugieres L, Plantaz D, François Emile J, et al. Endocrine involvement in pediatric-onset langerhans' cell histiocytosis: a population-based study. *The Journal of Pediatrics*. 2004; **144(3):** 344 – 350.
6. Aricò M, Girschikofsky M, Généreau T, Klersy C, McClain K, Grois N, et al. Langerhans cell histiocytosis in adults Report from the International Registry of the Histiocyte Society. *European Journal of Cancer*. 2003; **39(16):** 2341 – 2348.
7. Kaltsas G, Powles T, Evanson J, Plowman P, Drinkwater J, Jenkins P, et al. Hypothalamo-pituitary abnormalities in adult patients with langerhans cell histiocytosis: clinical, endocrinological, and radiological features and response to treatment. *Journal of Clinical Endocrinology & Metabolism*. 2000; **85(4):** 1370 – 1376.
8. Makras P, Alexandraki KI, Chrousos GP, Grossman AB, Kaltsas GA. Endocrine manifestations in Langerhans cell histiocytosis. *Trends in Endocrinology & Metabolism*. 2007; **18(6):** 252 – 257.
9. Donadieu J, Rolon M-A, Pion I, Thomas C, Doz F, Barkaoui M, et al. Incidence of growth hormone deficiency in pediatric-onset Langerhans cell histiocytosis: efficacy and safety of growth hormone treatment. *Journal of Clinical Endocrinology & Metabolism*. 2004; **89(2):** 604 – 609.
10. Kobayashi TK, Ueda M, Nishino T, Bamba M, Echigo T, Oka H, et al. Langerhans cell histiocytosis of the skull on cytologic squash preparations. *Diagnostic Cytopathology*. 2007; **35(3):** 154 – 157.
11. Fahrner B, Prosch H, Minkov M, Krischmann M, Gadner H, Prayer D, et al. Long-term outcome of hypothalamic pituitary tumors in Langerhans cell histiocytosis. *Pediatric Blood & Cancer*. 2012; **58(4):** 606 – 610.
12. Grois N, Fahrner B, Arceci RJ, Henter JI, McClain K, Lassmann H, et al. Central nervous system disease in Langerhans cell histiocytosis. *J Pediatr*. 2010; **156(6):** 873 – 881.