Case Reports

A Rare case of Adrenoleukodystrophy

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Adrenoleukodystrophy is a hereditary disorder involving the nervous system and adrenal cortex. It presents as progressive cerebral form to adrenomyeloneuropathy. However, cerebellar presentations are rare. We report a case of adrenoleukodystrophy, who had cerebellar manifestations along with preserved adrenocortical function.

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Abstract

In this case report, we describe a rare case of acquired intracavitary shunt from the left ventricle to the right atrium that was found four months after aortic valve replacement surgery. This comprises less than 1% of all congenital heart defects.

Key Words: Adrenoleukodystrophy, Adrenomyeloneuropathy, Very Long Chain Fatty Acids

Case Report

An 18 year old male presented with the history of fever of 6 months duration. The fever was gradual in onset, low grade and intermittent. He also had neurological complaints in the form of weakness of all the limbs of 15 years duration and developmental delay (ie, started walking after 2 years). The onset and progression of the weakness was gradual involving dominantly the distal muscles, which was followed by dysarthria. His elder sister also had similar neurological condition and died at an age of 18 years.

His vitals were stable. He had non-tender lymphadenopathy in the left cervical and axillary region, which was firm in consistency measuring 1.5cm in diameter. He also had high arched palate, skeletal abnormalities pescavus, pectusexcavatum and scoliosis (Fig 1-3). His cardiovascular and respiratory systems were normal. Abdominal examination revealed asplenomegaly. His higher functions were normal except for scanning speech. Spinomotor system examination revealed a normal tone in the upper limbs and hypotonia in the lower limbs, the power in the upper limbs were 4/5 and 2/5 in the lower limbs. The abdominal reflexes were retained while the plantar was bilateral extensor. The knee jerk was pendular bilaterally. His perception of pain, touch,temperature, joint position were normal except for a decreased vibration sense in the left lower limb. Hehad a broad base gait with ataxia. Pure tone audiometry revealed moderate sensorineural hearing loss. Patient was clinically suspected as a case of Friedreich Ataxia with moderate sensorineural deafness and Lymphoma in view of his lymphadenopathy.

On investigation the complete blood count, ESR, urinalysis, plasma electrolytes, renal, liver and thyroid function tests were normal. Test for HIV (I &II) was non- reactive, blood and urine culture showed no growth. ECG was normal, chest X- ray was normal except for bony deformities. USG abdomen showed few enlarged periportal lymph nodes. The biopsy of the lymph node showed non- specific inflammatory changes.

MRI showed Peritrigonal demyelination with involvement of splenium of corpus callosum and corticospinal tract features consistent with Adrenoleukodystrophy (Fig 4&5).

Fig - 1: High arched palate

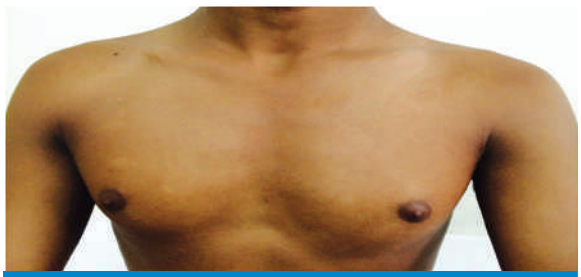

Fig - 2: PectusExcavatum

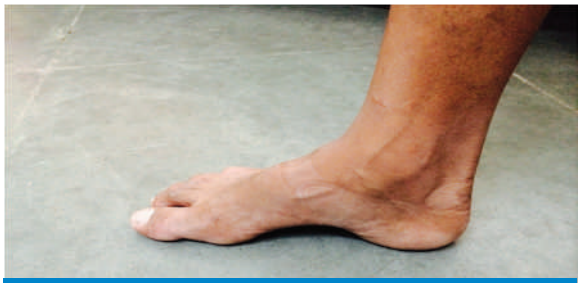

Fig - 3: PesCavus

For the confirmation of the diagnosis the cortisol level and very long chain fatty acid assay was done. The cortisol level was normal while very long chain fatty acid assay showed high level of C26:0 and C26/C22 ratio, normal level of C24/C22 ratio and low level of C22:0, C24:0, which is a feature of Adrenoleukodystrophy, confirming the MRI diagnosis.

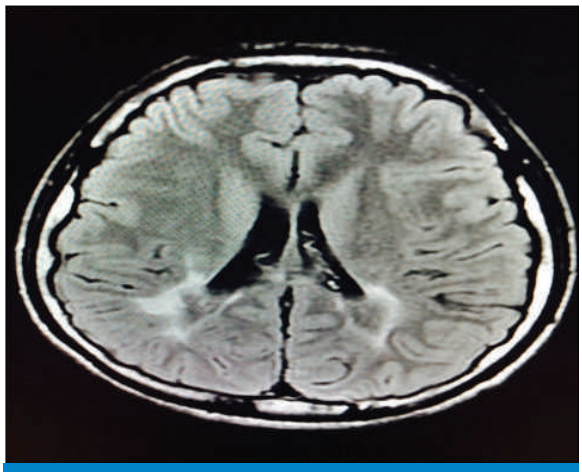

Fig - 4: T2 weighted

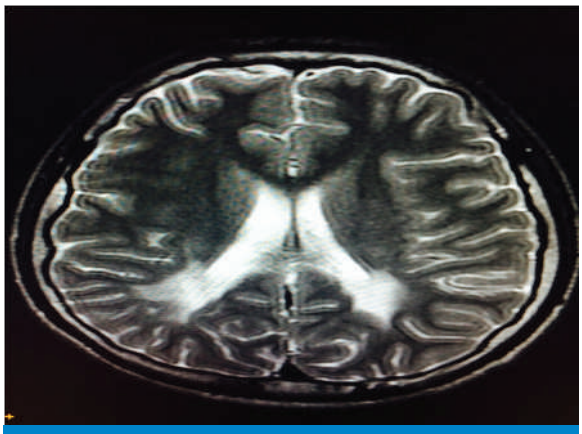

Fig - 5: T2 FLAIR

Discussion

X-linked adrenoleukodystrophy is a metabolic, peroxisomal disease affecting the nervous system, adrenal cortex and testis resulting from inactivating mutations in *ABCD1* gene which encodes a peroxisomal membrane, *ABCD1* defect is associated with impaired peroxisomal b-oxidation. Peroxisomal dysfunction causes very long chain fatty acids to accumulate in various tissues of nervous system, adrenal cortex and testis. Depending on the areas involved, this results in various symptoms.

Mutations in the ABCD1gene cause X-linked adrenoleukodystrophy. The ABCD1 gene provides instructions for producing the adrenoleukodystrophy protein (ALDP), which is involved in transporting certain fat molecules called very long-chain fatty acids (VLCFAs) into peroxisomes. Peroxisomes are small sacs within cells that process many types of molecules, including VLCFAs.

ABCD1 gene mutations result in a shortage (deficiency) of ALDP. When this protein is lacking, the transport and subsequent breakdown of VLCFAs is disrupted, causing abnormally high levels of these fats in the body. The accumulation of VLCFAs may be toxic to the adrenal cortex and myelin. Research suggests that the accumulation of VLCFAs triggers an inflammatory response in the brain, which could lead to the breakdown of myelin.

The phenotypes seen in male are Childhood cerebral form,Adrenomyeloneuropathy, Addison's disease. Childhood cerebral form is common in ages of four to eight years. Initially presents with hyperactivity, later with impairment of behavior, vision, hearing and motor function and lead to total disability within two years. Adrenomyeloneuropathy usually present in late twenties as progressive paraparesis, sphincter disturbance, sexual dysfunction and impaired adrenocortical function. Addison disease presents with adrenocortical insufficiency and is common in two years to adulthood, some neurologic disability may develop in later stages. 20% of females who are carriers can develop neurologic manifestation after 35, which resembles like adrenomyeloneuropathy

Diagnosis is based on clinical findings, MRI is always abnormal in males with cerebral disease and shows a pattern of symmetric enhanced T2 signal in the parieto-occipital region. Laboratory evaluation of the VLCFA level is a reliable diagnostic test, level of VLCFA especially C26:0 is elevated in plasma. Adrenal function is abnormal in 90% of neurologically symptomatic patients with childhood X- linked ALD.

Coticosteroid replacement therapy is essential for those with adrenal insufficiency. Diets low in Very long chain fatty acid and supplemented with lorenzo's oil reduces the level of VLCFAs. No proven effective therapy for the neurologic manifestation of ALD.

Conclusion

The case has been reported for its rarity because the patient had adrenoleukodystrophy with cerebellar manifestations and preserved adrenocortical function which is abnormal in more than 90% of the patients with ALD.

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