



A case of neurocysticercosis presenting as oculomotor nerve palsy

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Abstract :

Cysticercosis is a parasitic infestation that results from ingestion of eggs of adult tapeworm, *Taenia solium*. When cysticercosis involves the central nervous system, it is called neurocysticercosis. Neurocysticercosis is the most common parasitic infestation of the brain and a leading cause of epilepsy in the developing world, especially Latin America, India, Africa, and China. In this case, 16 year old male presented with complaints of sudden onset diplopia and drooping of left upper eyelid of one month duration. Evaluation of the patient revealed complete oculomotor nerve palsy on the left side. Patient was admitted with complaints of altered sensorium and ventriculo-peritoneal shunt done for dilatation of all ventricles one year before. He was empirically given anti tuberculous treatment . All investigations were normal including cerebrospinal fluid analysis on previous admission. Now the MRI brain showed multiple ring enhancing lesions at thalamus, midbrain and corpus callosum. MRI Spectroscopy showed elevated levels of lactate within the lesions suggestive of neurocysticercosis. Isolated oculomotor nerve palsy is a very rare manifestation of neurocysticercosis.

Keyword : neurocysticercosis, epilepsy, nerve palsy, ventriculoperitoneal shunt A 16 year old male presented with complaints of restriction of movement in the left eye with double vision of one month duration. It was sudden in onset and associated with drooping of the left upper eyelid. On further questioning patient gave history of headache on and off for one year. He was admitted with altered sensorium in Govt General Hospital, Chennai one year ago. Investigations including CSF analysis for tuberculosis were within normal limits. CT scan showed dilatation of all the ventricles with periventricular leucomalacia. Ventriculo peritoneal shunt was done one year ago. He was treated empirically with a course of category- I ATT for 9 months. There was no history of contact with known tuberculous patient or handling animals. He was



Figure 1: Clinical photograph showing ptosis on left eye

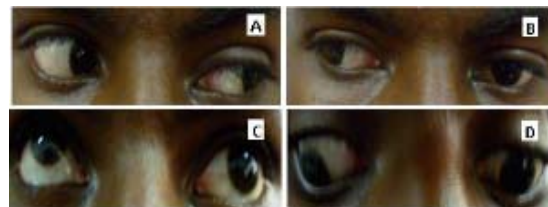


Figure 2: Clinical photograph showing full abduction (fig.2a), restricted adduction (fig.2b), elevation (fig.2c) and depression (fig.2d)

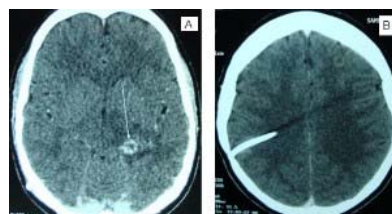


Figure 3: photograph of CT brain showing ring enhancing lesion at base of brain (fig 3a) and Ventriculo peritoneal shunt (fig 3b) in position

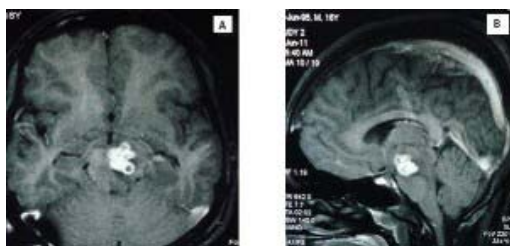


Figure 4a and b photograph of MRI brain showing multiple ring enhancing lesions at the level of midbrain

On ocular examination, the uncorrected visual acuity in both eyes was 6/6. Mild ptosis was present in the left eye (fig 1) with MRD of +2. Extra-ocular movements were full in right eye, whereas all movements except for abduction and intorsion were limited in the left eye (fig 2 a, b, c and d). Pupil in right eye was reacting to light and in left eye it was 5mm, not reacting to both direct and consensual reflexes. Fundus in both eyes was normal. Visual fields and colour vision were normal in both eyes. General examination was normal. On examination of central nervous system higher functions were normal. Cranial nerve examination was normal except for the oculomotor nerve on the left side. Motor, sensory and cerebellar systems were found to be normal. Based on clinical features, a diagnosis of left sided isolated complete oculomotor nerve palsy of sudden onset was made. Patient was investigated to rule out intracranial space occupying lesion. Baseline investigations including blood sugar and blood pressure were found to be normal. CT brain showed contrast enhancing lesion at the bifurcation of basilar artery suggestive of basilar artery aneurysm (fig3a and b). MRI brain showed hetero-intense lesion with surrounding hyper-intensity in thalamus and cerebellum. Patient was advised MRI with contrast which revealed multiple ring enhancing lesions in the midbrain and splenium of corpus callosum suggestive of neurocysticercosis (fig 4a and b). Stool examination was found to be normal. Neurologist opinion was obtained and patient was started on Tab.albendazole 15 mg/kg/day in two divided doses for 30 days.

DISCUSSION:

Neurocysticercosis is the most common parasitic infestation of the central nervous system caused by *Taenia solium*¹ (pork tapeworm). It is the main cause of acquired epilepsy in developing countries. It is endemic in India. It affects men and women equally². Neurocysticercosis is acquired via faeco-oral route³ by contaminated food. Humans act as a definitive host carrying the adult tapeworm and pigs act as intermediate host harboring the larval form. The larval form of the parasite is ingested by man, by eating raw or under cooked pork containing the encysted larval form. The alternate route is by auto-inoculation.

Life cycle of *Taenia solium*

This infection is caused by ingestion of eggs shed in the human excreta. Pigs and humans become infested by ingesting the eggs or gravid proglottids. Humans are infested either by ingestion of contaminated food containing eggs, or by auto infestation. In the latter case, a human infested with adult *T. solium* can ingest eggs produced by that tapeworm, either through faecal contamination or possibly, from proglottids carried into the stomach by reverse peristalsis. Once eggs are ingested, oncospheres hatch in the intestine, invade the intestinal wall, and migrate to striated muscles, as well as the brain, liver and other tissues, where they develop into cysticerci. The life cycle of the parasite is completed in human when undercooked pork containing cysticerci is ingested. Cysts evaginate and attach to the small intestine by their scolex. They develop into adult tapeworms. They grow up to 2 to 7 metres in length and produce less than 1000 proglottids, each with approximately 50,000 eggs. They reside in the small intestine for years. In human, cysts can cause serious sequelae if they localize in the brain, resulting in neurocysticercosis.

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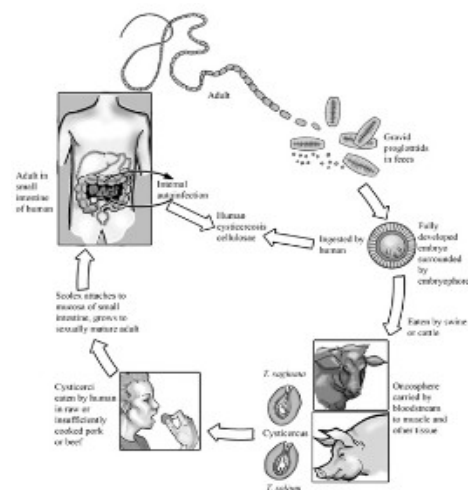


Figure 5: Life cycle of *Taenia solium*

neurological deficits related to strokes and ocular motor nerve palsies. The other clinical findings are intracranial hypertension, hydrocephalus, chronic meningitis and vasculitis⁴. Other forms of neurocysticercosis include intrasellar neurocysticercosis which mimics pituitary tumour and spinal neurocysticercosis. Eye, skin and other organs can also be affected. In the ocular form, parasite is found most commonly in the extra ocular muscles. Rarely is it seen in the sub-retinal space. Blood investigations show peripheral leucocytosis, eosinophilia, elevated ESR. N-acetyl aspartate and creatine levels are decreased and levels of lactate, alanine and succinate are elevated on magnetic resonance spectroscopy. CSF analysis shows mononuclear pleocytosis, normal glucose, elevated protein, high levels of IgG and the presence of oligoclonal band. The presence of eosinophilia is suggestive of neurocysticercosis but is

also present in neurosyphilis and tuberculosis of central nervous system. But when the parasites are located within the brain parenchyma, the results of CSF analysis may be normal. Stool examination may be positive as taeniasis and neurocysticercosis co-exists in 10-15% of patients. Immunologic tests include ELISA of CSF which shows 50% sensitivity and 65% specificity. Enzyme linked Immunoelctrotransfer blot (EITB) of serum is highly sensitive (98%) and highly specific (100%).

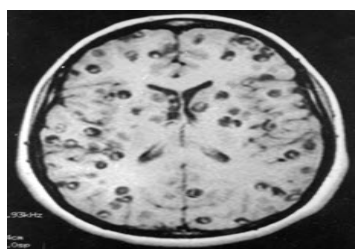


Figure 6: Photograph of MRI brain showing multiple ring shaped lesions typical of Neurocysticercosis

CT scan is the preferred modality of choice for detection of parenchymal calcification. MRI is the imaging modality of choice which shows multiple ring enhancing lesions (fig 6). Scolex is seen as T2 hyper-intense lesion. Treatment includes anti-parasitic agents combined with steroids and anti-convulsants. Albendazole is the only drug that kills the parasite. Simultaneous use of dexamethasone increases the plasma levels of albendazole and decreases its rate of elimination⁵. Ventricular shunt is done in cases of hydrocephalus⁶. Prognosis is good in most of the cases and seizures respond well to anti-epileptic agents. Neurocysticercosis should also be thought of as a cause of nerve palsy. Neurocysticercosis is also seen in vegetarians. Neuro imaging is the confirmatory investigation for the diagnosis.

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