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, a 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, ventriculo-peritoneal 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. Ventricle peritoneal shunt was done one year ago. He was treated empirically with a course of category-1 ATT for 9 months. There was no history of contact with known tuberculous patient or handling animals. He was treated with anti tuberculous treatment.

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 Ventricle peritoneal shunt (fig 3b) in position
Neurocysticercosis is acquired via the faeco-oral route by contaminated food containing the encysted larval form. The alternate route is by auto-inoculation. 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.

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.

DISCUSSION:

Neurocysticercosis is the most common parasitic infestation of the central nervous system caused by Taenia solium (pork tapeworm). It is the main cause of acquired epilepsy in developing countries. It is endemic in India. It affects men and women equally. Neurocysticercosis is acquired via the faeco-oral route by 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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Blood investigations show peripheral leucocytosis, normal glucose, elevated protein, high levels of IgG and the presence of eosinophilia, elevated ESR. N-acetyl aspartate and glucose, elevated protein, high levels of IgG and the presence of eosinophilia is suggestive of neurocysticercosis but is rare. It is found most commonly in the extra ocular muscles. 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 creative 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 85% specificity. Enzyme linked Immunoelectrotransfer 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 elimination. Ventricular shunt is done in cases of hydrocephalus. 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.

**REFERENCE:**


2 Bharucha NE: Epidemiology of epilepsy in India. 2003; 44: 9-11.


