

Case Report

Starry sky appearance in Neurocysticercosis

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	International Archives of Integrated Medicine, Vol. 4, Issue 1, January, 2017.	
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	Available online at http://iaimjournal.com/	
	ISSN: 2394-0026 (P)	ISSN: 2394-0034 (O)
	Received on: 07-12-2016	Accepted on: 18-12-2016
	Source of support: Nil	Conflict of interest: None declared.
How to cite this article: N.S Neki, Gagandeep Singh Shergill, Amritpal Singh, Puneet Bans Sidhu, Amanpreet Kaur. Starry sky appearance in Neurocysticercosis. IAIM, 2017; 4(1): 131-133.		

Abstract

Endemic in India, Neurocysticercosis (NCC) is perhaps one of the oldest known and perhaps the most common parasitic infections of the human nervous system. It is a major cause of epilepsy and neurological disease in many developing countries. In 2015, the WHO Food borne Disease Burden Epidemiology Reference Group identified *T. solium* as a leading cause of deaths from food-borne diseases, resulting in a considerable total of 2.8 million disability-adjusted life-years (DALYs). *T. solium* cysticercosis was added by WHO to the list of major neglected tropical diseases in 2010. The diagnosis is imaging based which shows characteristic “starry sky” appearance in heavy infestation cases.

Key words

Starry sky appearance, Neurocysticercosis, *T. Solium*.

Introduction

Endemic in India, Neurocysticercosis (NCC) is perhaps one of the oldest known and perhaps the most common parasitic infections of the human nervous system. It is a major cause of epilepsy and neurological disease in many developing countries [1]. In 2015, the WHO Food borne Disease Burden Epidemiology Reference Group

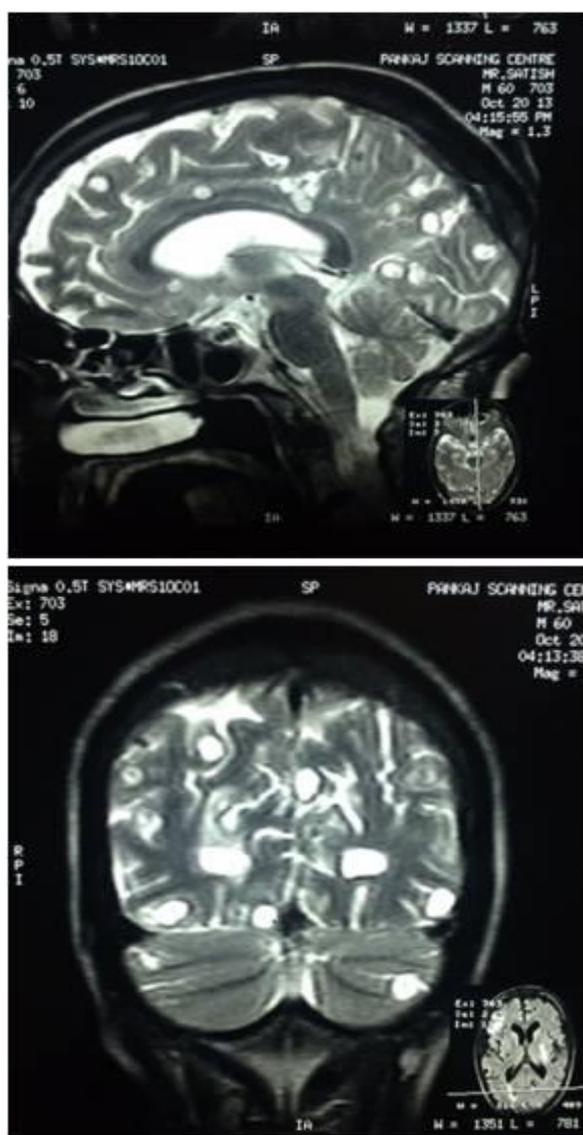
identified *T. solium* as a leading cause of deaths from food-borne diseases, resulting in a considerable total of 2.8 million disability-adjusted life-years (DALYs). *T. solium* cysticercosis was added by WHO to the list of major neglected tropical diseases in 2010 [2]. The diagnosis is imaging based which

shows characteristic “starry sky” appearance in heavy infestation cases.

Case report and Discussion

A 36 years old Bihari migrant worker presented to us in the emergency of Govt. Medical College and Guru Nanak Dev Hospital, Amritsar with history of several episodes of generalised tonic clonic seizures since last 2 days. His neurological examination revealed bilateral extensor plantars and brisk deep tendon reflexes. Everything else was virtually normal. We requested for his magnetic resonance imaging and it showed a peculiar “starry sky appearance” diagnostic of NCC (Picture - 1, 2).

Picture – 1, 2: Starry sky appearance.



Neurocysticercosis (NCC) is the most common cause of acquired epilepsy in developing countries. NCC is caused by infection of the human central nervous system (CNS) with encysted larvae of the tapeworm *Taenia solium*. Cysts may be found in the CNS, skeletal muscle, subcutaneous tissue, and the eyes, although they may be found in any human tissue. It can present variably depending on the location and stage of cysts in the nervous system, and the host immune response. The most common presentation of parenchymal NCC is with seizures that are usually focal and brief; status epilepticus occurs in some cases. About a third of cases have headache and vomiting. In the extraparenchymal NCC, the manifestations include raised intracranial pressure and hydrocephalous, arachnoiditis, chronic meningitis and Stroke. Cysts within or compressing on the spinal cord occur in 1–5% cases of adult NCC. They can cause various symptoms and signs of spinal dysfunction. Those within the eyes and in the extraocular muscles can cause visual deficits, other eye symptoms, and limitation of eye movements. Unusual presentations of NCC may include behavioural changes, neurocognitive deficits, dystonia.

Diagnosis is made by either CT or MRI. Single, small, contrast enhancing lesions are the most common; visualization of a scolex is diagnostic. Some cases have multiple cysts with a characteristic starry-sky appearance [3]. In cases with symptomatic parenchymal NCC, the most common CT finding is a single, small (<20 mm), low-density lesion with ring or disc enhancement which has been termed as a SSECTL. The scolex appears as a bright high-density eccentric nodule and is pathognomonic of NCC. Multiple lesions are seen in some cases; numerous cysts of varying stages may give the so-called ‘starry-sky’ appearance which is typical of NCC. The cysts may appear as multilobed CSF isointense lesions that occupy the cisterns, Sylvian fissure or cerebellopontine angle. The findings of arachnoiditis and chronic meningitis such as enhancement of tentorium and basal cisterns, hydrocephalous and occasionally infarcts may be

seen. Intraventricular cysts causing obstruction and hydrocephalous may be visualized.

Tuberculomas, microabscess, toxoplasmosis, fungal lesion, low-grade astrocytoma and cystic cerebral metastasis are the important differential diagnosis of enhancing lesions which should be considered [4].

Management of NCC involves the use of cysticidal therapy and symptomatic therapy. Corticosteroids are used simultaneously to reduce cerebral oedema. Management of NCC needs to be individualized. NCC is potentially eradicable; proper sanitation and hygiene are important. Simultaneous mass treatment of the population with anthelmintics, and vaccination of pigs has been suggested and is in progress in Peru [5].

All cases on treatment require periodic follow up. Cases with single lesions generally has good prognosis: seizures are usually well controlled and lesions disappear within 6 months in over 60% cases. Cases with multiple lesions and those with calcifications often have frequent seizure recurrences. *Cysticercus* encephalitis and

extraparenchymal NCC have a guarded prognosis.

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