CASE REPORT

CEREBRAL SPARGANOSIS PRESENTING AS GRAND MAL EPILEPSY

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Abstract

A rare case of cerebral sparganosis is described. This is an uncommon condition particularly in Europe. It is most frequently seen in SE Asia but may be found anywhere in the world. The life cycle of the causative organism is described and contrasted with the principal differential diagnosis of parasitic inflammatory lesions of the brain, *Taenia solium*, the causative organism of cysticercosis. The treatment of cerebral sparganosis is surgical and diagnosis is most commonly made at the time of pathological examination. The importance of pre-surgical diagnosis is stressed as the treatment of the cysticercosis is pharmacological.

Introduction

Spirometra monsoni is a species of tapeworm that infects domestic animals and, rarely, humans. In its lifecycle the plerocercoid larva stage is called a sparganum and the infection in humans is sparganosis. The infection is spread by ingestion of infected uncooked food or water and the larva migrate to any part of the body and cause symptoms due to local tissue reaction and pressure as they grow. Most documented cases are from Southeast Asia, although it has been noted sporadically throughout the world (1). We report a case of cerebral sparganosis in a British Army chef which presented as an epileptic seizure.

Case Report

In July 2005, a 25 year old male from Lilongwe in Malawi enlisted into the British Army. After basic training he was posted to serve as a chef in Northern Germany. In September 2006 he presented to the local Emergency Department with an episode of headache and dizziness; his pulse, blood pressure and blood glucose were normal and he was discharged without a diagnosis. One week later whilst working in the regimental kitchen he started trembling and shaking for 2 minutes during which time he became unconscious. A colleague subsequently found him confused with only a gradual return of consciousness. An epileptic seizure was diagnosed and he was downgraded and excused weapon handling and exercises. He was referred to medical out patients in Hohne and subsequently admitted to a neurological unit in Hannover two weeks later. At the neurological centre, an MRI scan revealed a contrast enhancing ring shaped lesion in his right temporo-occipital lobe (Figure 1). A liver ultrasound demonstrated only a small haemangioma. Serological examination for borrelia, toxoplasmosis and echinococcus were negative as was a HIV serology test. Lumbar puncture was also normal. The diagnosis of cerebral abscess was made and he was transferred to a neurosurgical centre where a right temporal craniotomy and removal of the abscess was performed without complications.

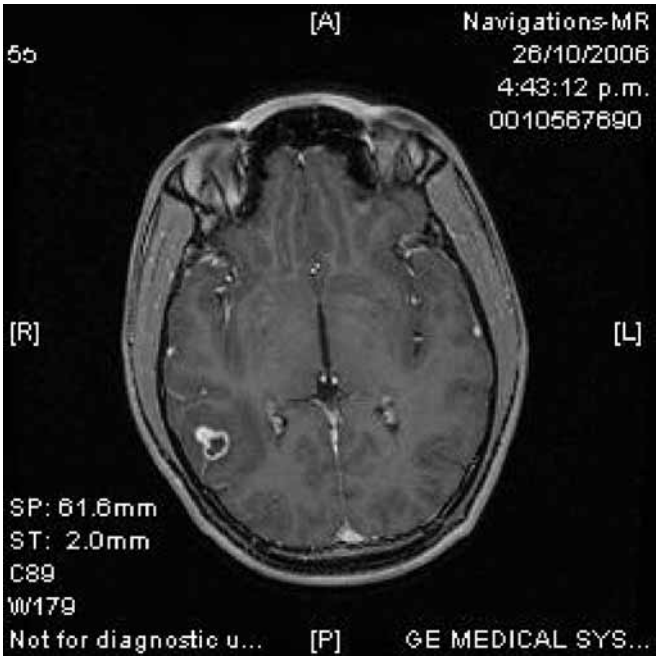

Figure 1. Ring shaped contrast enhanced lesion in right temporo- occipital lobe

He was discharged two weeks after surgery and his post operative course has been uneventful without neurological sequel or epileptic fits, and he was discharged two weeks later. He spent Christmas leave in Malawi before which he was strongly counselled on the need for proper food and water hygiene. Three stool samples taken on his return did not reveal cysts or ova. Accordingly he has been allowed to return to his former catering duties. In view of his craniotomy, he is excluded from guard duties, weapons handling and driving motor vehicles for 12 months; but a complete recovery with a return to full medical grading is expected.

Histology showed a chronic cerebral abscess with evidence of a parasite within (Figure 2). Sections were sent to the School of Veterinary Medicine in Hannover and to the Bernhardt-Nocht Institute in Hamburg. Their opinion was that the structures in the centre of the abscess were probably the intermediate stage of

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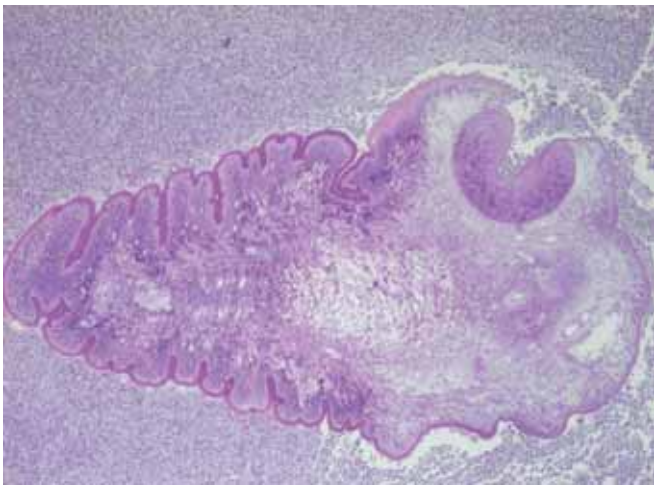

Section of a larva of a cestode worm showing pseudosegmentation, a prominent tegument and the bothrium at the right side without evidence of hooklets.(PAS, original magnification x40)

a cestode worm, raising the possibility of cysticercosis but subsequent serological testing was negative. Thus the diagnosis of sparganosis was made on pathological grounds.

Discussion

Spirometra monsoni is a white, ribbon shaped tapeworm (cestode) with an interesting life cycle. The adult worms inhabit the intestine of dogs and cats and may grow up to 1.5 m in length. Their eggs develop into proceroid larvae which are passed in faeces. These are eaten by an intermediate host such as a snake, bird, frog, rat or mouse, where they develop into a plerocercoid larva. When cats, dogs, foxes or wolves ingest the intermediate host the adult worms develop and the cycle is complete (1). The larvae are often referred to by the generic name *Sparganum*, because this stage was previously thought to represent a separate genus.

Humans ingest the proceroid stage through drinking infected water or possibly through eating infected, raw intermediate hosts such as snakes or frogs, a traditional practice in some SE Asian countries (1). As the larvae are then within accidental hosts they are in a 'reproductive blind alley'. The larvae migrate throughout the body and can grow to up 40 centimetres in length. The most prevalent area for migration is subcutaneous fat where they present as an inflamed itchy lump; ocular involvement may result in blindness. The treatment is by complete excision of the larval cyst.

The main differential diagnosis for such parasitic infections is cysticercosis - infection by the cestode *Taenia solium*. It's life cycle differs from that of S. *monsoni*. Humans are the designated host, with cattle and pigs the intermediate host. Humans are infected by eating infected meat; humans can also act as an intermediate host by ingestion of the eggs via the faeco-oral route. The larvae migrate to any part of the body acting as space occupying lesions. Treatment in this case is medical by anti-helminthic drugs such as praziquantel (2). Importantly, praziquantel is inactive against sparganum larvae in the CNS (1,3). Cysticercosis may be confirmed by positive serology; sparganosis is rarely diagnosed pre-operatively (4).

Sparganosis is a rare disease: a 2003 review described only 6 cases in Europe (5), and there have been only a few cases noted since (6). Globally, it may be more common than is reported. The literature suggests that cerebral cysticercosis is the leading parasitic inflammatory lesion of the brain to cause epilepsy, such as the series of seven cysticercosis positive cases reported in Gurkha soldiers by Heap (2). However there may be underreporting of sparganosis due to the ineffectiveness of medical reporting systems in non-industrialised countries where the majority of sparganosis cases originate (7).

Conclusion

Sparganosis is a condition which although rare in the Western World may be more common in countries where health care is less advanced. Parasitic brain infection needs to be considered in any traveller presenting with focal neurological symptoms from countries with poor hygiene conditions anywhere in the world. It is important to differentiate sparganosis from cysticercosis of the central nervous system as it requires surgical not medical treatment.

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