

Single small enhancing CT Lesions, with special reference to neurocysticercosis: How I treat

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Abstract

Single small enhancing CT lesions (SSECTL) have been very commonly encountered in clinical practice. These lesions typically are small (often < 20 mm), enhancing as a ring lesion or a disc and with varying amounts of surrounding edema. Most SSECTL present as focal seizures. Once the diagnosis of SSECTL and likely to be a solitary cysticercus lesion is made, the patient is given appropriate AED therapy. Depending on the resolution pattern on repeat imaging performed at intervals not less than six months if patient remains asymptomatic, cysticidal therapy is instituted along with AEDs. Any deviation from the classical clinical or radiological patterns needs further evaluation and other etiologies described for the SSECTL will need to be ruled out, including that of tuberculosis. Largely these lesions resolve and the clinical condition remains benign and in most patients AEDs can be withdrawn in two to three years period.

Key Words

Cysticercosis, epilepsy, SSECTL

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Introduction

Single small enhancing computed tomography lesions (SSECTL) have been very commonly encountered in clinical practice, ever since they were discovered in the late 1970s following the advent of computed tomography (CT) of the brain. These lesions typically are small (often <20 mm), enhancing as a ring lesion or a disc and with varying amounts of surrounding edema. Usually there is neither any significant midline shift nor enhancing exudates. Very often a concentric dot representing the scolex is visible. The core is hypodense and represents a cystic fluid. Although initially thought to be tubercular in etiology, their spontaneous resolution without antitubercular treatment raised questions regarding their true identity. Table 1 lists the causes of SSECTL. Therefore, although not necessarily *sine qua non* with neurocysticercosis, most SSECTL turn out to be cysticercus in nature.^[1]

Clinical presentation

Most SSECTL present as focal seizures. Epilepsy is the commonest presentation (70-88%), followed by headache (43.4%), papilledema (28%), pyramidal signs (27.2%), cognitive decline (21.5%), ataxia (15.8%), vision loss (10%), and optic atrophy (10%). Uncommon presentations include psychosis, diplopia, vertigo, lower cranial palsies, hypoesthesia, sensorineural deafness, spinal cord compression, meningeal signs, radicular symptoms, and Parinaud's syndrome.

Diagnostic criteria for SSECTL presentation of cysticercosis (solitary cerebral cysticercus granuloma (SCCG)) presenting with seizures.

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Table 1: Causes of SSECTL

Neurocysticercosis (most common)
Tuberculosis
Glioma
Secondaries
Brain abscess
Focal encephalitis
Cryptic arteriovenous malformation (AVM)
Infarct
Toxoplasmosis
Fungal granuloma
Lymphoma

Clinical criteria^[2]

Patient should have seizures

1. There should be no features of persistent increased intracranial pressure.
2. There should be no evidence of a progressive neurologic deficit.
3. There should be no evidence of a systemic illness such as primary malignancy, pulmonary or systemic tuberculosis, and/or focus of pyogenic infection.

CT criteria

1. The lesion should be solitary.
2. The lesion should enhance after contrast injection.
3. The lesion should measure <20 mm in maximum dimension.
4. Edema may or may not be present around the lesion and should not cause midline shift.

These criteria were validated in a prospective study and found to have a sensitivity of 99.5% and specificity of 98.9%.

Investigations for the etiological diagnosis of SSECTL

Various immunological tests for anti-cysticercal antibodies in serum and cerebrospinal fluid have not been sensitive or specific for diagnosis. Resorting to biopsy of these lesions, which are essentially benign, is not justified.

Is magnetic resonance imaging (MRI) required?

The most common neuroimaging test is CT brain, considering its availability, accessibility, and economic concerns. Current advanced CT machines have fairly good diagnostic sensitivity. However, small lesions in posterior fossa or close to the bone, or intraventricular or basal cisternal cysts may be missed. MRI has better accuracy, but may miss small calcifications. However, MRI is far more expensive and less available. Hence, it is not mandatory to perform MRI for every case of SSECTL. Follow-up scans for monitoring resolution of the lesion will also be simpler and less expensive with CT.

Management of a Patient Presenting with Ssectl and Seizures**Antiepileptic drugs (AEDs)****Choice of AEDs**

Any AED (single) which can be used as primary drug for symptomatic epilepsies can be chosen according to patient preference. Most patients (85-90%) respond to a single AED.^[3,4]

AED therapy is the mainstay in the management of patients diagnosed with an SCCG. Monotherapy with a single AED is adequate in >85% of patients. In my practice, I start either with phenytoin or carbamazepine or levetiracetam according to the affordability, the gender, and other individual preferences as the first-line AED. The usual precautions and counseling with regards to drug compliance is emphasized to the patients and caregivers.

Duration of AEDs

The consensus is to give the AEDs for a full duration of 2.5 years without seizures and taper and stop over next 6 months. However, some literature does suggest that AEDs can safely be withdrawn within 2-12 weeks of total resolution of the lesion on follow-up neuroimaging.

Cysticidal drugs

In a previous study in adults, no difference was seen with albendazole given for 7 days. Spontaneous resolution of the lesion was seen within 3 months in >70% of the cases.^[4,5] No difference was also noted in children with SSECTL with albendazole treatment. However, further studies showed a better seizure control with albendazole and also better resolution. A more recent study showed a combination of albendazole with praziquantel to be statistically comparable to albendazole alone in resolution of the lesions.^[6] A recent Cochrane review found that for viable lesions in children, there were no major trials and in adults, no difference was detected with albendazole compared to no treatment or with steroids.^[7] The duration of albendazole treatment also varied from 3 days to 1 week to 1 month, with no definitive recommendations of preference of one regime. Cysticidal therapy has been associated with headaches, or seizures. I give albendazole for 1 month at a dosage of 15 mg/kg of body weight. I start slow, with half a tablet of albendazole of 400 mg/day and build up gradually every 2 days by 200 mg to full dose. Albendazole is generally given under the cover of steroids which are then tapered rapidly and stopped over a period of 2 weeks' duration.

Role of steroids

Most cases which received steroids do so due to severe headaches or as accompanying drug with albendazole to prevent headaches or seizures when receiving cysticidal therapy.^[8] The duration of steroids is usually short and individualized according to the patient's symptoms.

Current practice

Once the diagnosis of SSECTL and likely to be a solitary cysticercus lesion is made, the patient is given appropriate AED therapy. CT is repeated at 6 months' interval or earlier if there are unexplained recurrences of seizures, headaches, or other features. The extent of resolution is gauged in the repeat CT. If the resolution is at least 50% and above, no further change in treatment is done and AED therapy is continued. CT is repeated at the end of 6 months. If the lesion if resolved or continues to show more than 50% resolution from previous scan, no further therapy is added and AED is continued. The next CT can be performed at the end of 1 year. The AED therapy can be tapered at the end of 2 or 2.5 years period of seizure-free interval and stopped. In majority of cases, the lesion fully resolves or leaves a calcified spot.

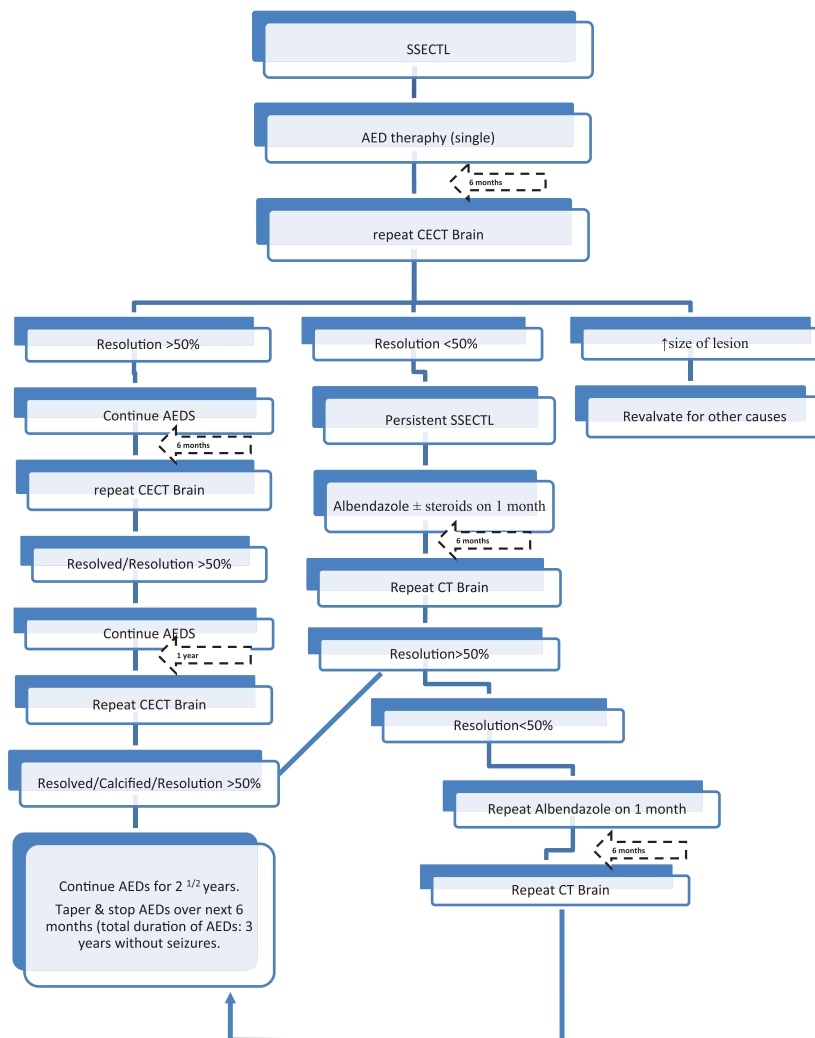


Figure 1: Flow chart of treatment paradigm for SSECTL. SSECTL = Single small enhancing computed tomography lesions, AED = Antiepileptic drug, CECT = Contrast-enhance computed tomography

If at the end of 6 months, the repeat CT does not show resolution or is less than <50%, it is termed as “persistent lesion”. A course of albendazole is given in such cases (15 mg/kg/day for 1 month in divided doses; gradually increase the dose over 1 week). A short course of steroids is recommended with albendazole or primed before initiating albendazole to prevent headaches or seizures, which can happen on account of increased inflammation due to the dying cyst. The further follow-up will remain similar as described above.

Any deviation from the classical clinical or radiological patterns needs further evaluation and other etiologies described for the SSECTL will need to be ruled out, including that of tuberculosis. At each review, patients should be assessed carefully for new symptoms and signs, especially for raised intracranial pressure or focal neurological deficits or systemic features such as fever, cough, or anorexia. Presence of any of these mandates a repeat fresh evaluation for other etiologies of these lesions.

Surgical therapy is rarely required for these patients. Current indications include an enlarging lesion or a persistent lesion with difficult to control seizures [Figure 1].

Outcome

In a typical case of SSECTL which is an SCCG, spontaneous resolution of the lesion is the rule, but the rate of resolution is highly variable in individual patients. The seizure outcome is good with >90% of patients remaining seizure-free even after discontinuation of AEDs.

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Conflicts of interest

There are no conflicts of interest.

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