

# Isolated Orbital Cysticercosis Involving the Superior Oblique Muscle

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**Abstract:** Cysticercosis is a parasitic infection caused by the larval forms of *Taenia solium*. Humans acquire the disease by ingestion of the eggs or the larvae. The larvae then enter the blood stream and affects systemic organs like the brain and the striated muscles. Ocular involvement can be either intraocular (anterior and posterior chamber) or of the orbital adnexae (extra-ocular muscles, subconjunctival space, optic nerve, and lacrimal glands). The superior rectus muscle is most commonly involved. Diagnosis of orbital adnexal cysticercosis requires high clinical index of suspicion. Ultrasound of the orbit can demonstrate the scolex within the hypoechoic cystic lesion. CT shows a hypodense lesion with a hyperdense scolex, and detects calcification. MRI offers better characterization of the lesion. It is hyperintense on fluid sensitive sequences with a hypointense scolex on thin sections. T2 and FLAIR shows adjacent inflammatory changes. Enhancement depends on the stage of infection. Differentials include pseudotumor (not cystic and lacks scolex, involves tendinous insertion) and metastasis (known primary). Adnexal lesions are treated medically, while surgery is reserved for residual lesions and intra-ocular, subconjunctival and eyelid lesions.

**Keywords:** orbital, ocular, cysticercosis, scolex, taenia solium

## 1. Introduction

Cysticercosis is a parasitic infection caused by the larval forms of *Taenia solium*. It is common in endemic countries like India. Humans acquire the disease by ingestion of the eggs or the larvae. The larvae then enter the blood stream and affects systemic organs like the brain and the striated muscles. Cysticercosis is one of the preventable causes of blindness [1]. Ocular involvement can be either intraocular (anterior and posterior chamber) or of the orbital adnexae (extra-ocular muscles, subconjunctival space, optic nerve, and lacrimal glands) [2]. In India, the adnexal involvement is more common compared to intra-ocular [2].

## 2. Case presentation

A 35 year old man presented with the complaints of recurrent painless swelling of his right orbit with double vision since two years. On examination, there were no signs of inflammation. The visual acuity was normal. There was restricted movement of the extra-ocular muscles on levo-elevation. Complete blood counts showed raised eosinophil counts.

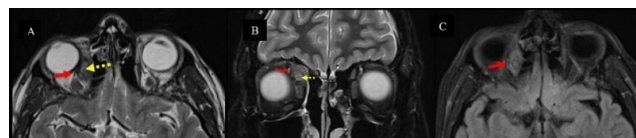
An unenhanced CT of the brain and orbits was done which showed the right superior oblique muscle to be bulky with a soft tissue component and a hyperdense focus within it (Figure 1).



**Figure 1:** Axial, coronal and sagittal sections of the unenhanced CT scan of the orbits shows bulky right

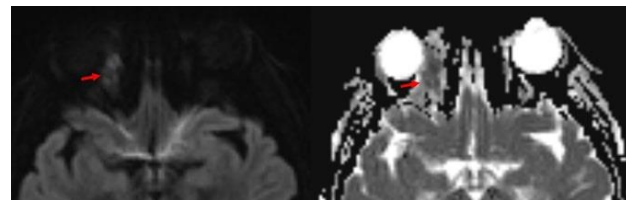
superior oblique muscle with a soft tissue component (red arrow) and a hyperdense focus within (yellow arrow).

For further characterization, an MRI of the orbits was performed. There was a T2/FLAIR hyperintense soft tissue within the right superior oblique muscle with a tiny hypointense focus within (Figure 2).

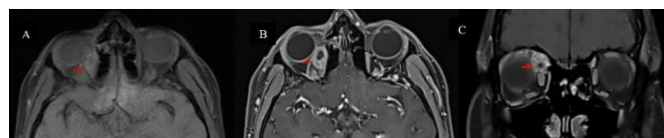


**Figure 2:** Axial (A) T2, coronal T2 (B) and axial FLAIR (C) sequences of the MRI of the orbit shows a hyperintense lesion in the right superior oblique muscle (red arrow) with a central hypointensity (yellow arrow).

It showed diffusion restriction (Figure 3), with mild post contrast enhancement (Figure 4).



**Figure 3:** Axial diffusion weighted sequence shows true diffusion restriction within the lesion in the right superior oblique muscle with corresponding drop on the ADC map (red arrow). ADC-apparent diffusion coefficient.



**Figure 4:** Fat saturated axial pre-contrast T1 (A), post-contrast axial (B) and coronal (C) T1 weighted sequences

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shows mild enhancement within the lesion in the right superior oblique muscle (red arrow) with a central non-enhancing component.

There were no lesions in the neuroparenchyma. The patient was started on oral albendazole and prednisolone, following which there was resolution of symptoms. The patient was then lost to follow up and repeat imaging was not done.

### 3. Discussion

The usual symptoms of adnexal cysticercosis are swelling, diplopia, proptosis, ptosis, strabismus and occasionally cellulitis [1]. Vision loss is seen with the intra-ocular form. The superior rectus muscle is most commonly involved [2]. Some authors reported lateral rectus muscle to be commonly involved [3]. The obliques are not commonly affected [2,3,4]. The muscle bellies are involved more than the tendinous insertions [3]. Isolated ocular cysticercosis is relatively uncommon, and neurocysticercosis coexists in 24% of the cases.

The stages of cysticercosis are vesicular stage (cyst with a scolex and no inflammation), colloid vesicular (with enhancement and edema) and calcified nodular (no inflammation) [1]. Inflammation is seen when the larva begins to die and the cyst wall becomes leaky, leading to release of toxins. These stages are appreciated on radiological investigations. Patients are symptomatic when the edema sets in.

Intra-ocular cysticercosis doesn't pose a diagnostic challenge, however orbital adnexal cysticercosis requires high clinical index of suspicion [5]. The diagnosis is based on clinical, serological and radiological findings. Serological tests include ELISA, indirect immunofluorescence, indirect hemagglutination [1]. These can be false positive in few cases. Blood tests can show eosinophilia.

Radiology plays a crucial role in diagnosis. Ultrasound is the initial mode which depicts anechoic cyst with a scolex, which is usually hyperechoic [6]. On A-mode, high amplitude spikes corresponds to the scolex (calcareous corpuscles) and the cyst wall. It is useful in assessment during follow up. CT shows a hypodense lesion with a hyperdense scolex. There might be inflammatory changes in the adjacent tissues. It also detects calcification better than MRI [2]. MRI offers better characterization of the lesion. It is hyperintense on fluid sensitive sequences with a hypointense scolex on thin sections. T2 and FLAIR shows adjacent inflammatory changes. Enhancement depends on the stage of infection, and is seen in the colloid vesicular stage. Concomitant neurocysticercosis should be ruled out on either CT or MRI.

Differentials include pseudotumor (not cystic and lacks scolex, involves tendinous insertion), epidermal inclusion cysts (no enhancement), metastasis (known primary), melanoma (T1 hyperintense), lacrimal gland tumor (superolateral location) [3].

Adnexal lesions are treated medically, comprising of oral albendazole 15mg/kg and prednisolone 1mg/kg for four weeks [1,2,7]. Surgery is reserved for residual lesions and intra-ocular, subconjunctival and eyelid lesions [1].

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