

# Near Reflex Paresis - A Rare Presentation of Arachnoid Cyst

Vidhya Chandran

Department of Pediatric Ophthalmology, Sankara Eye Hospitals, Bangalore, India

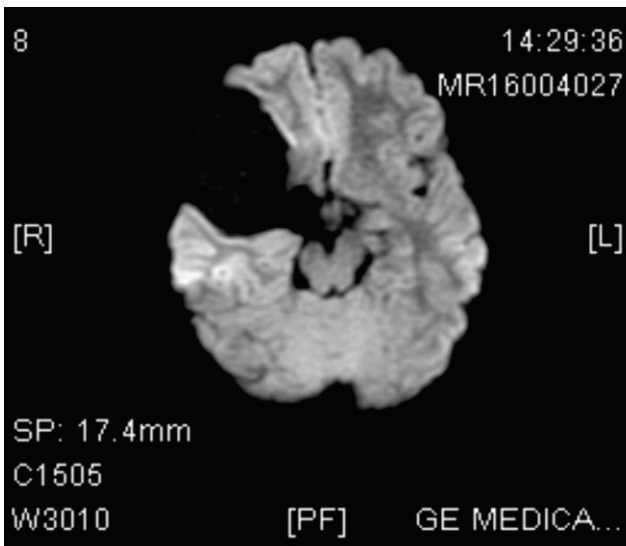
**Abstract** Arachnoid cysts are cerebrospinal fluid covered by arachnoidal cells and collagen that may develop between the surface of the brain and the cranial base or on the arachnoid membrane, one of the 3 meningeal layers that cover the brain and the spinal cord.<sup>1</sup> In this article, we describe a 10-year-old boy with an arachnoid cyst of the right fronto-temporal area that led to a near reflex paresis in the eyes. This presentation has been never reported in the literature.

Delhi J Ophthalmol 2018;28;44-5; Doi <http://dx.doi.org/10.7869/djo.356>

**Keywords:** Arachnoid cyst, Near reflex, frontal eye field

## Case Report

A 10 years old boy came with the complaints of double vision for while reading for the past 3 weeks. There was no associated headache or vomiting. His performance in the school was normal. On examination, he was found to have BCVA of 6/6 in both eyes. Cover test revealed orthophoria for the distance. Cover test for near could not be done as he could not converge the eyes. Extraocular movements were full. Pupils were 3 mm in size and reacting to direct and indirect light reflex in both eyes, but there was no constriction of pupils for attempted near reflex. Convergence was poor with near point of convergence >45 cm. Near point of accommodation was found to be 50 cm. Humphrey field test tried but he had many fixation losses. Cycloplegic refraction was normal. Fundus examination was normal. No evidence of papilloedema was present. Neurological examination was normal. He was diagnosed as a case of near reflex paresis. MRI brain scan with contrast was done and it revealed a large well defined extra-axial CSF intensity lesion involving the right middle cranial fossa with fronto-temporal mass effect on the optic chiasma- the features suggesting of Arachnoid cyst (type iii) (Figure 1 & 2).



**Figure 1:** Axial T2 Flair image showing a right fronto temporal mass



**Figure 2:** MRI coronal image with contrast showing the well defined arachnoid cyst

## Discussion

Arachnoid cysts are a congenital disorder, and most cases begin during infancy; however, onset may be delayed until adolescence.<sup>2</sup> Arachnoid cysts are seen in up to 0.2 to 1.7% of the population.<sup>3</sup> Arachnoid cysts can be relatively asymptomatic or present with insidious symptoms. Symptoms vary by the size and location of the cyst(s), though small cysts were usually have no symptoms and are discovered only incidentally. On the other hand, a number of symptoms may result from large cysts. The onset of the symptoms and signs are usually due to cortical irritation, compression of the cerebral parenchyma, or the obstruction of CSF circulation. They reduce the perfusion and metabolism in surrounding cortical regions.<sup>4</sup> Its symptoms are very diverse, such as headaches, epilepsy, hydrocephaly, intracranial hypertension, macrocephaly, calvarium prominence, cranial nerves palsies, vertigo, discrete proptosis, hemiparesis, mental retardation or even be asymptomatic. It is more common in males and on the left side.<sup>5</sup> MRI is the diagnostic procedure of choice because of its ability to demonstrate investigation the exact location, extent, and relationship of the arachnoid cyst to adjacent brain or spinal cord. The near reflex or accommodation reflex is characterised by pupillary constriction to sharpen the

image on the retina, convergence of optic axis and increased convexity of the lens to increase its refractive power. The accommodation or near reflex starts in the Retinal ganglion cells → optic chiasma → optic tract → lateral geniculate body → optic radiations → visual cortex (area 17) → prefrontal cortex (frontal eye field) → oculomotor nucleus → Edinger Westphal nucleus → third cranial nerve → ciliary ganglion → short ciliary nerves – which causes pupillary constriction by contraction of constrictor pupillae, and increases the anterior curvature of lens through the contraction of ciliary muscles. From the frontal eye field, the impulses again passes into somatic motor nucleus, which in turn causes contraction of medial rectus leading to convergence.

Supranuclear lesions results in bilateral paralysis of accommodation with sparing of the pupil light reflex, but the lesions of the peripheral oculopara-sympathetic pathway typically result in unilateral paralysis of accommodation and paralysis of the pupillary light reflex in the same eye. This is because the peripheral impulses for pupil constriction and accommodation originate in the same visceral (Edinger-Westphal) nuclei and follow the same peripheral pathway to the eye. Thus, the patient with an acute lesion in the peripheral pathway subserving accommodation will more likely seek medical consultation for the associated mydriasis than the blurred near vision.<sup>6</sup>

In this case, the fronto-temporal mass was pressing on the frontal eye field thereby causing the near reflex paresis.

The management of arachnoid cysts of the cerebellopontine angle remains controversial. Asymptomatic arachnoid cysts do not require treatment, and such patients should be monitored clinically and radiologically with serial MRIs. If the patient demonstrates no significant compromise in local neural or vascular structures, no severe symptoms, and no suspected or proven rapid cyst growth, a watch-and-wait policy should be implemented.<sup>7</sup>

Though the teaching is that if pupillary light reflexes are normal, the near reflex would also be normal, we have to keep in mind this rare condition where pupillary light reflexes are normal with near reflex alone being affected. In conclusion, in children with near vision problems, proper evaluation of pupils should be done to look for near reflex paresis and neuroimaging needs to be initiated. We also conclude that we should be careful about red flags in medical history and physical examination.

### References

1. Ariai S, Koerbel A, Bornemann A, Morgala M, Tatagiba M. "Cerebellopontine angle arachnoid cyst harbouring ectopic neuroglia". *Pediatr Neurosurg* 2005; 41:220-3.
2. Gelabert-Gonzalez M. "Intracranial arachnoid cysts". *Rev Neurol* 2004; 39:1161-6.
3. Eskandary H, Sabba M, Khajehpour F, Eskandari M: Incidental findings in brain computed tomography scans of 3000 head trauma patients. *Surg Neurol* 2005; 63:550-3.
4. De Volder AG, Michel C, Thauvoy C, Willems G, Ferriere G: Brain glucose utilisation in acquired childhood aphasia associated with a sylvian arachnoid cyst: recovery after shunting as demonstrated by PET. *J Neurol Neurosurg Psychiatry* 1994; 57:296-300.
5. Borges G, Zambelli HJ, Fernandes YB, Carelli EF, Borges LB. Arachnoid cyst: adversity and plasticity. *Arq. Neuro-Psiquiatr* 1999, vol.57, n.2B, pp.377-381
6. Clinical Neuro-ophthalmology by Walsch and Hoyt pg no.777
7. Eslick GD, Diplopia and headaches associated with cerebellopontine angle arachnoid cyst. *ANZ J Surg* 2002; 72: 915-7.

**Cite This Article as:** Chandran V. Near Reflex Paresis - A Rare Presentation of Arachnoid Cyst.

**Acknowledgements:** Nil

**Conflict of interest:** None declared

**Source of Funding:** None

**Date of Submission:** 22 December 2017

**Date of Acceptance:** 01 February 2018

### Address for correspondence

**Vidhya Chandran ms**

Consultant,  
Department of Pediatric Ophthalmology,  
Sankara Eye Hospitals, Bangalore, India  
Email id: dr.optho.vidhya@gmail.com



Quick Response Code

