

Case Report

Benign abducens nerve palsy: diagnosis by exclusion

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ABSTRACT

Of all the cranial nerves, the abducens nerve has the longest intracranial course hence is most common cranial nerve to be affected secondary to any potentially devastating intracranial cause. It can indicate significant underlying pathology. Abducens or sixth cranial nerve innervates lateral rectus muscle and pathology of this nerve results in abduction deficiency of ipsilateral eye. Most of the time it will be unilateral but bilateral involvement is also well known. It can recur without any underlying identifiable pathology. The 6th nerve palsy is considered as benign after ruling out all possible causes. Benign causes account for just 9 to 14% of all 6th nerve palsies in children. Most of the time benign 6th nerve palsy occurs after viral infection or vaccination as an immunological reaction. In our case patient had history of pentavalent vaccination 1 month back. After thorough investigation and ruling out all possible causes it was attributed to post vaccination immunological reaction. which resolved spontaneously over 4 months.

Keywords: Abducens nerve, Convergent squint, Pentavalent vaccine

INTRODUCTION

Extraocular muscle palsies can indicate the presence of a significant underlying pathology. They are even more alarming in childhood because of the missing vascular aetiology (diabetes and hypertension), which is the most prevalent cause in adult population.

Abducens/sixth cranial nerve, with its longest subarachnoid course from dorsal pons to lateral rectus muscle, is easily affected by tumour, trauma, hemorrhage, infections, demyelinating conditions, Miller Fisher syndrome, Gradenigo's syndrome and rarely by ophthalmoplegic migraine.¹ If there is no suggestive history or symptoms and signs indicative of one of the five topographical syndromes: brainstem syndrome, elevated intracranial pressure syndrome, petrous apex syndrome, cavernous sinus syndrome or orbital syndrome, the patient can be classified as a case of isolated sixth nerve palsy. But radiological confirmation

is important. Early diagnosis is often critical in some conditions that present with sixth nerve palsy. Benign abducens nerve palsy is a known entity in pediatric age group with Incidence is 7.6 per 100000.² The etiology of isolated benign sixth nerve palsy remains uncertain.

Diagnosis is made by exclusion and the severe underlying pathologies have to be ruled out. Authors present a case of a 4-month-old girl who presented to our department with a sudden onset of left eye esotropia one month after receiving the pentavalent vaccination.

CASE REPORT

A 4-month-old female child presented with history of deviation of left eye towards right for 4 days, history of pentavalent vaccination 1 month back. No history suggestive of trauma, meningitis and features of raised intracranial tension. Neurodevelopmentally appropriate for age.



Figure 1: Left lateral rectus palsy on presentation.



Figure 2: Recovery of left lateral rectus palsy on follow up.

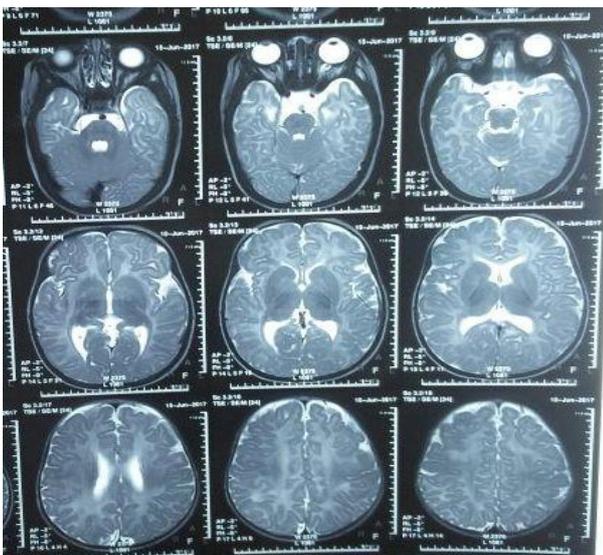


Figure 3: MRI brain showing normal study.

Child was active, interested in surroundings, afebrile, vital parameters were stable (pulse rate:116 bpm, respiratory rate:32/min),on examination: anterior fontanelle open measuring 2x2 cm, fronto-parietal bossing, mangoloid slant, depressed nasal bridge, left convergent squint was present, anthropometric measurements were within centiles (length: 61 cm, between 15th and 50th centile, weight : 6.5 kg, between 50th and 97th centile, head circumference: 42 cm,between 50th and 97th centile; charts provided by WHO), systemic examination: CNS:3,4,6th cranial nerve-convergent squint on left side, horizontal movement of left eye limited, normal tone, power and reflexes, Rest systemic examination: normal.

The child was investigated to rule out other possible causes of 6th nerve palsy. The child's hemogram was normal (hemoglobin concentration:11.2 gm/dL, hematocrit:35.7,total leukocyte count:14300/mm³; platelet count: 363000/mm³), USG skull: normal; CT brain: normal; child was managed conservatively with syrup calcium, syrup vitamin D, and advised to follow up with MRI brain scan to rule out other possible causes for 6th palsy.

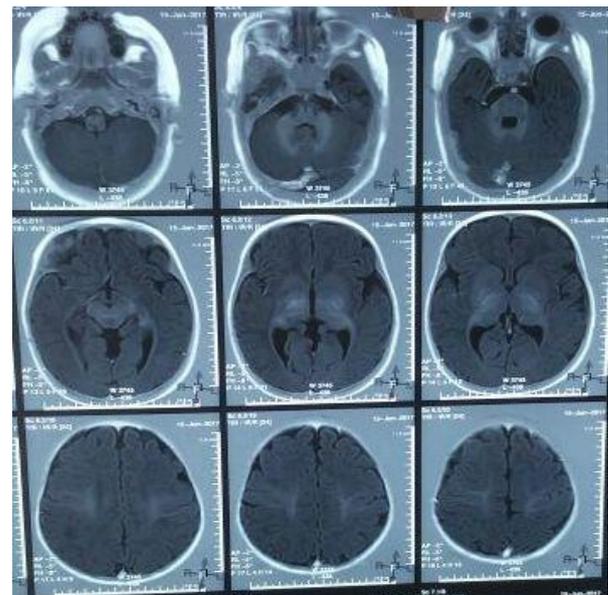


Figure 4: MRI brain showing normal study.

MRI brain suggestive of a tiny focus of blooming in left posterior parietal sub-cortical white matter most likely s/o calcification, otherwise normal study. Diagnosis of benign abducens nerve palsy was considered by excluding other possible causes and attributed to post vaccination (pentavalent vaccine) neurotropic effect.³ On follow up there was complete resolution of 6th nerve palsy with normal vision.

DISCUSSION

Benign abducens palsy in the majority of patients will be ipsilateral, recurrent, and painless. It is common in

female with left-sided preponderance.¹ Palsies have been attributed to neurotropic effects of an infectious agent, as well as to para infectious aetiology. Despite a seemingly temporal association between benign 6th nerve palsy and infections in children, the exact pathophysiological mechanism remains unclear. It has been postulated to be caused by damage arising from autoimmune mediation or direct neurotropic effect of viral infection leading to demyelination or by a localised arteritis.⁴

Epstein-Barr virus and cytomegalovirus have been documented etiologies. Other uncommon etiologies include *Mycoplasma pneumoniae* infection, *Chlamydia pneumoniae* infection, and Lyme disease.⁵ Painless palsies were associated with a preceding infection or immunization, in our case it was attributed to post vaccination.³ The majority of acquired abducens nerve palsies in children are caused by intracranial tumours, hydrocephalus and trauma.⁶ For this reason, neuroimaging is recommended in all children with acute and chronic sixth nerve palsies.⁷⁻¹¹

Lumbar puncture with cerebrospinal fluid analysis for viral PCR may aid diagnosis although this was not performed in our patient as it was deemed too invasive. Further investigations that may be warranted based on a suggestive history are electrodiagnostic tests, such as visual evoked potentials and electroretinography, and serum antiganglioside antibodies for association with Guillain-Barre syndrome. No systemic or neurologic sequelae are reported and, in the majority of patients, spontaneous full recovery in 6 months has been observed. Our patient recovered within 4 months. The average interval between recurrences is reported to be 1.3 years. Management should include screening and treatment of amblyopia, as well as exclusion of a transition into concomitant non-paralytic esotropia. At least 6 months after the onset of an acute sixth nerve palsy, the chance for spontaneous recovery is greatly reduced and surgery can be considered. Although the prognosis for benign isolated abducens nerve palsy is usually excellent, possible complications have to be considered.

CONCLUSION

Benign abducens nerve palsy is well known clinical entity. The etiology of isolated benign sixth nerve palsy remains uncertain. Diagnosis is made by exclusion and the severe underlying pathologies have to be ruled out. Despite excellent prognosis possible complications have to be considered.

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