CASE REPORT

PROLONGED TRANSIENT CEREBELLAR EYE CLOSURE IN A POSTOPERATIVE CEREBELLAR JUVENILE PILOCYTIC ASTROCYTOMA TUMOR RESECTION. CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

We report one of the longest periods of TCES in a 5-year-old child who underwent cerebellar tumor resection. Our findings suggest that TCES can extend beyond what has been described in the literature.

Keywords: Transient cerebellar eye closure, Posterior fossa syndrome, Cerebellar ataxia, Juvenile Pilocytic Astrocytoma

INTRODUCTION

Posterior fossa tumor surgery can result in devastating and serious neurosurgical complications, some of which are well known and studied in the literature; however, transient cerebellar eye closure (TCES) after posterior fossa tumor surgery in children is an exceedingly rare postoperative complication, where few papers describe the pathology that exists. The pathophysiology of this phenomenon is not yet clear, as some theories are postulating a psychogenic origin, and others are attributing it to an organic cause.

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CASE REPORT

This is a 5-year old female patient not known to have had any previous medical illnesses; she presented with unsteadiness and frequent falls for two months. Upon physical examination, the patient was conscious, alert, oriented, and vitally stable. Neurological examination only revealed signs of cerebellar ataxia and nystagmus. All her laboratory investigations were within normal. Magnetic Resonance Imaging (MRI) with and without intravenous gadolinium of the brain was done, showing a large mass lesion (measuring 78 x 67 x 66 mm) related to the right cerebellar hemisphere and vermis encroaching on the fourth ventricle (Figure 1); MRI of the whole spine was unremarkable. Patient underwent suboccipital craniotomy, and her tumor was resected without any intraoperative complications. The frozen and final pathology of the lesion revealed Juvenile Pilocytic Astrocytoma (JPA).

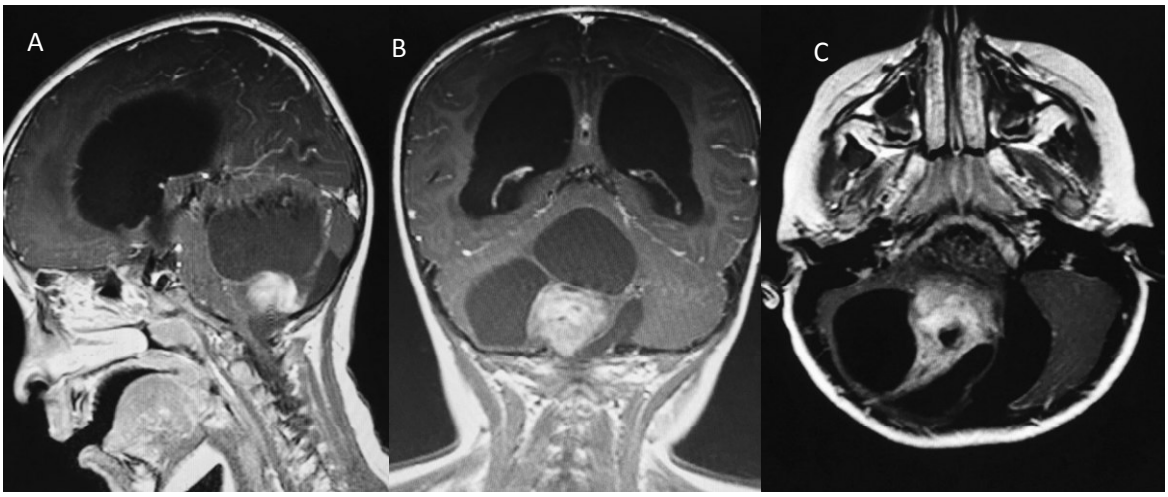

Figure 1: T1 contrasted sequence of brain MRI in A) sagittal, B) coronal, and C) axial planes, showing a markedly enhanced posterior fossa tumor surrounded by a large cyst with a severe obstructive hydrocephalus.

The next morning, the patient developed posterior fossa syndrome (PFS). Also, she developed TCES that lasted seven weeks, with the patient intermittently obeying commands every now and then; however, she was unable to open her eyes at all.

Seven weeks later, the patient opened her eyes and started recovering slowly from PFS and TCES.

METHOD

In our case report and literature review, we looked at all TCES papers written in English. There were not many papers written on this subject due to the rarity of the pathology; however, all papers in this matter are discussed below.

DISCUSSION

In 1969, Nashold and Slaughter published the first paper on this matter, of a patient being unable to open both eyes after brain surgery in human beings.[1] In their paper, a 21-year-old patient developed transient inability to open the eyes after electrodes were implanted in the region of the brachium conjunctivum and the medial dentate nucleus bilaterally, for treatment of severe tremor of both upper limbs; however, the clinical finding was only described without being named.[1]

A long time passed by, until 1991, where Gaskill and Marlin readdressed the finding, and they described four children with unusual presentations, which they named later as TCES following posterior fossa surgery. The patients were unable to open their eyes after cerebellar tumor surgery. Furthermore, it

was reported that three out of four were found to have cerebellar mutism, followed by dysarthria.[2]

Later, two different research groups reported a total of seven children (3, 4) who developed TCES in association with postoperative posterior fossa syndrome.[3,4]

Catsman-Berrevoets CE, et al. (2003),[5] noticed that among 55 children who underwent surgeries for cerebellar tumors between the years 1989 and 1999, 17 of them developed PFS and ongoing dysarthria, where 1 of the 17 had TCES. They observed this child and documented the stages of the TCES.

The group was the first to describe TCES stages. The patient was a 14-year-old girl diagnosed with cerebellar tumor; she underwent tumor resection surgery. The child developed TCES postoperatively, and it was noticed that she improved between the 15th day and the seven-week mark. The four distinct stages were the following: the first stage, where the patients are responding to verbal commands with noticeable eye movement with eyelids being closed; the second stage, where the patient is responding by blinking on verbal commands; the third stage, spontaneous eye opening that increases in frequency and duration over time—however, the patient fails to open the eyes on verbal commands; and the fourth stage, where the eye opening becomes spontaneous on verbal commands.[5] In this case, the duration was relatively long in comparison to children described by Gaskill and Marlin; however, the girl's mutism persisted. In 2009, Nasseret et al. described similar clinical findings of postoperative TCES, in a postoperative course of a 5-year-old girl who underwent surgical resection of a cerebellar pilocytic astrocytoma tumor; however, there was no clear mention of the duration of TCES.[6]

The mechanism of TCES remains unclear, but many theories have been put forward; for instance, one of them states that the inability to open the eyelid is related to weakness or paralysis of musculus levator palpebrae and may result from complete or partial dysfunction of the superior branch of the oculomotor nerve or at its origin in the dorsocaudal portion of the third cranial nerve nucleus.[5] Others like Humphrey et al. suggested that it might be a psychological effect, and they called it " refusal to open eyes."[5] Despite that, they all remain speculations, and the exact mechanism remains unknown.

CONCLUSION

In our patient, the Transient Cerebellar Eye Closure (TCES) lasted for seven weeks. Our review shows that this is one of the longest reported periods of TCES, as most of the reported cases had recovered between four days and four weeks.

To the best of our knowledge, based on PubMed and other search engines, TCES in our patient is one of the longest periods that has been reported in the pediatric population in English literature, and is the first reported case in the Kingdom of Saudi Arabia.

REFERENCES

1. Nashold BS, Jr., Slaughter DG. Effects of stimulating or destroying the deep cerebellar regions in man. J Neurosurg. 1969; 31(2):172-186.
2. Gaskill SJ, Marlin AE. Transient eye closure after posterior fossa tumor surgery in children. Pediatr Neurosurg. 1991; 17(4): 196-198.
3. Pollack IF, Polinko P, Albright AL, Towbin R, Fitz C. Mutism and pseudobulbar symptoms after resection of posterior fossa tumors in children: incidence and pathophysiology. Neurosurgery. 1995; 37(5):885-893.
4. Siffert J, Poussaint TY, Goumnerova LC, et al. Neurological dysfunction associated with postoperative cerebellar mutism. J Neurooncol. 2000; 48(1):75-81.
5. Catsman-Berrevoets CE, Van Dongen HR, Aarsen FK, Paquier PF. Transient cerebellar eye closure and mutism after cerebellar tumor surgery: long-term clinical follow-up of neurologic and behavioral disturbances in a 14-year-old girl. Pediatr Neurosurg. 2003; 38(3):122-127.
6. Nasser MJ. Transient cerebellar eye closure after posterior fossa surgery in a 5-year-old child. Childs Nerv Syst. 2009; 25(5): 635-637.