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Case Report CHILD HEALTH&DISEASES

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Congenital mirror movement associated with migraine: A case report

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ABSTRACT

Mirror movements occur in early childhood, due to the maturation of the corpus callosum of non-crossing motor pathways.It was considered normal until the age of 10 and was rarely reported after 10 years. Mirror movements are involuntary movements that occur in homologous contralateral extremity on voluntary activation. Permanent mirror movements can occur with anomalies, however also reported familial and sporadic cases. Migraine is the most common primary headache in childhood. Prevalence ranges from 1–3% between the ages of 3–7 and 8–23% in the adolescence. In adolescence, girls are more frequent. Imaging studies are not necessary for diagnosing migraine; detailed history and physical examination are sufficient. In this study, here we present a girl with mirror movement accompanied migraine.

Keywords: Child; migraine; mirror movements.

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Mirror movement disorder is a condition in which voluntary movements on one side of the body are simultaneously mirrored by involuntary movements on the other side of the body. The condition tends to disappear before the age of 10 with the myelination of the corpus callosum, and it persists only in rare cases after the age of 10 [1]. The condition may be genetically transmitted, but may also occur spontaneously. Its association with many different clinical conditions has been reported, ranging from cerebral palsy to schizophrenia [2, 3].

This study contributes to the relevant literature with a specific case who was presented to our clinic with a complaint of a headache, and who claimed to have suffered from persistent mirror image movements since early childhood that was not found to be associated with any anomaly during investigations.

CASE REPORT

A 17-year-old female patient who was presented to our clinic with the complaint of an intense headache that had persisted for three years. The patient described a unilateral, pulsatile headache. The patient described additional symptoms of nausea, photophobia and phonophobia, occurring on at least two days a week, which was leading to a discontinuity in school on at least one day a month, and which lasted for at least six hours, increasing with fasting or effort. During the patient's physical examination, it was recognized when making hand movements; she moved the opposite hand in a similar way. This condition had existed since the patient's early childhood. She rarely complained of awkwardness and had not previously applied to a physician related to this issue. She stated that

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she was especially disturbed when writing or carrying a teapot. There was no history of similar complaints in the family. The findings of an examination of other systems, vital findings and an optic fundus evaluation were normal. According to the International Headache Society Headache Classification-3 beta (ICHD-3 beta), the patient was diagnosed with migraine [4]. In the laboratory investigation, the hemogram, routine biochemistry and thyroid function tests were normal. A magnetic resonance imaging (MRI) of the brain and a cervical spinal MRI were normal. During the electromyographic (EMG) analysis, the intentional contractions of the intrinsic hand muscles and the forearm's flexor and extensor muscles caused electrophysiological activity in the same muscle groups in the opposite arm. Based on the findings, the patient was diagnosed with mirror movement disorder and migraine and began treatment with flunarizine. During the patient's reevaluation at the end of three months, the frequency and intensity of the headache decreased, while no change was experienced in the frequency of the mirror movements.

DISCUSSION

The term "mirror movement" refers to simultaneous contralateral, involuntary, identical movements that accompany voluntary movements, and it was first used by Erlenmeyer in 1879. Mirror movement is defined as involuntary, synkinetic mirror reversals of an intended movement of opposite side. These movements are soft, neurologic signs that are seen uncommonly in clinical practice. The examination of patients for the presence or absence of mirror movement does not normally form part of a routine neurological assessment, although it could provide some important clues in some cases [1–4]. In general, movements of the upper extremities' distal sites are identically mirrored by the contralateral side. Besides being inherited autosomal dominantly and recessively, although having no clear cause in some cases, it has been reported to be associated with many developmental anomalies or diseases, including Kallmann syndrome, Klippel Feil Syndrome, diastematomyelia, cervical meningocele, stretched spinal cord, Chiari type I and III, corpus callosum agenesis, basilar invagination, chondrodystrophy, Usher syndrome, epilepsy, dystonia, stroke, Friedreich ataxia, diabetes insipidus, phenylketonuria and intracranial tumor [3, 5]. Although it is commonly seen during early childhood, its prevalence and intensity decreasewith advancing age. The origin of these mirror movements in childhood is not currently known, although it is believed that the ipsilateral corticospinal tract is also activated during voluntary movements. Under normal conditions, this activation is inhibited by the corpus callosum, andsince the myelination of corpus callosum fibers is completed by round about the age of 10, the transcallosal pathways cannot perform their functions completely until these ages. As a result, the essential inhibition cannot be achieved, and this leads to mirror movement on the side contralateral to the voluntary movement [6]. There was no history of a similar condition in the members of the patient's family. The patient's complaints had been recognized during early childhood and had neither progressed nor regressed. Thus, the previously reported myelination mechanism in corpus callosum was highly likely to be responsible for our patient's mirror movements.

Migraine is the most common cause of primary headaches in childhood, and its prevalence is 1-3% between the ages of 3–7, and 8–23% during puberty, and most often in girls during puberty. Diagnoses of migraine are based on history and examination, which does not require imaging, and commonly is accompanied byother neurological and systemic conditions [4, 7]. The complaints defined by the patient were compatible with the migraine when evaluated according to the ICHD-3 beta. The patient's complaints regressed following treatment with flunarizine.

In conclusion, mirror movement is a rarely encountered condition and is mostly identified when the patient declares the complaint. Despite this, a detailed physical examination is quite important in the cases where the patient is disturbed by the existence of the condition, as is the case in the present study. A diagnosis of mirror movement could be easily made from anamnesis and physical examination findings. Various diseases and syndromes should be investigated considering the accompanying clinical findings. Treatment for mirror movement is usually not essential.

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