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Case Report Pediatry

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 noncrossing motor pathways. Such movements are considered normal until the age of 10 and are rarely reported in children older than 10 years. Mirror movements are involuntary movements that occur in the homologous contralateral extremity on voluntary activation. Permanent mirror movements can occur with anomalies; however, also are reported familial and sporadic cases. Migraine is the most common primary headache in childhood. Its prevalence ranges from 1% to 3% between the ages of 3 and 7, and from 8% to 23% in the adolescence. The prevalence of migraine in adolescent girls is higher. For the migraine diagnosis, the imaging studies are unnecessary, and a detailed history and physical examination are sufficient. In this study, we present a case of a 17-year-old girl with mirror movements accompanied by migraine.

Keywords: Child; migraine; mirror movements.

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The 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 in children older than 10 years [1]. The condition may be genetic, but it 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 patient who 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 were not found to be associated with any anomaly during investigations.

CASE REPORT

A 17-year-old female patient presented to our clinic complaining of intense headache that had persisted for 3 years. The patient described a unilateral, pulsating headache. She also described additional symptoms of nausea, photophobia, and phonophobia, occurring at least 2 days a week, which led to school absence on at least 1 day a month, and which lasted for at least 6 hours, increasing with fasting or effort. On physical examination, 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 she was especially disturbed when writing or carrying a teapot. There was no history of similar complaints in the

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family. The 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 the 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 flunarizine treatment. During the patient's reevaluation at the end of 3 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, first used by Erlenmeyer in 1879, refers to simultaneous contralateral, involuntary, and identical movements that accompany voluntary movements. The mirror movement is defined as involuntary, synkinetic mirror reversals of an intended movement on the opposite side. These movements are soft, neurologic signs not commonly seen in clinical practice. The examination of patients for the presence or absence of mirror movements 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. In addition to being autosomal inherited 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 decrease with age. The origin of these mirror movements in childhood is currently unknown, 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, and since the myelination of corpus callosum fibers is completed by about the age of 10, the transcallosal pathways cannot perform their functions completely until this age. As a result, the essential inhibition cannot be achieved, and this leads to the mirror movement on the side contralateral to the voluntary movement [6]. There was no history of a similar condition in the patient's family. The patient's complaints had been acknowledged 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% to 3% between the ages of 3 and 7, and 8% to 23% during adolescence, and most often in girls during adolescence. The migraine diagnosis is based on patient's history and examination, which does not require imaging, and is commonly is accompanied by other neurological and systemic conditions [4, 7]. The complaints defined by the patient were compatible with migraine when evaluated according to the ICHD-3 beta. The patient's complaints regressed following the treatment with flunarizine.

In conclusion, the mirror movement is a condition rarely encountered, mostly identified when the patient complains about it. Despite this, a detailed physical examination is important in 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 can be easily made from the anamnesis and physical examination findings. Various diseases and syndromes should be investigated considering the accompanying clinical findings. The treatment for mirror movements is usually not essential.

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