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Mirror Movement

A Case Report

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Voluntary movements initiated in one arm or leg which are copied involuntarily by the other is a congenital disorder of motor control. Limited accounts of the mirror movements syndrome which is also often called "associated movement" or "bimanual synkinesia" have been reported in literature since 1888.[1]

Mirror movements observed predominantly in the hand, which are not associated with other neurological abnormalities, are rare.[2] Several reports dealing with familial cases have been published.[3-4] Mirror movements have also been observed in patients with spastic paresis, extrapyramial disorders, lesions of the parietal cortex, phenylketonuria, Friedreich's ataxia and skelatal abnormalities of the craniocervical region.[5-10]

In this report we present a case of mirror movement along with the review of the literature.

Case

D.E. (Prot.No. 125959) A ten year old girl was seen at the Hacettepe Children's Hospital in Ankara, in September 1969, because the voluntary movements in one hand were accompanied synchronously by involuntary movements in the other.

She was the firstborn of normal unrelated parents whose family showed no similar disorders. Past history of the child including the period of pregnancy, delivery, growth and development were described as normal. The patient was a healthy-looking child, with a weight of 24 kgs, height of 127 cm. and a head circumference of 51 cm. The physical examination revealed no abnormal findings excepting the bilateral pes planus.

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During the neurological examination the child was unable to move her fingers independently. Every act of her one hand was more or less duplicated by the other. When she grasped things with her hand, for instance when she was holding a cup or shaking the doctor's hand or trying to write, the fingers of her left hand simultaneously duplicated the motions in a "mirror-like fashion". However, passive movements of the fingers of one hand did not simulate "mirror movements" in the other. There were no mirror movements in her arms, lower extremities or her face. Other results of the neurological examinition were within normal limits.

Laboratory Findings

Calcium 9.6 mg/100 cc, phosphorus 6.4 mg/100 cc, alkaline phosphatase 10.4 B. Ü. The X-rays of the thorax and the skull were normal. Cervical spine films revealed no congenital defects.

Treatment

The patent was given 150 mg of sodium diphenyl-hydantoinate and 10 mg of chlordiazepoxide (librium) per day for three months but no benefit was derived from this treatment.

Discussion

The patient described above is a classical case of "Mirror movements" of the hand.

Mirror movements have been reported occasionally among patients with anomalies of the central nervous system, but have rarely been noted in healthy individuals.[3-10]

In 1913 Burr and Crowe described[2] the case of a young sailor who displayed symptoms similar to those of our patient. Since then various authors[1 3 4 7] have given detailed accounts of mirror movements.

Haerer[1] suggests the cause of this syndrome to be an abnormal dominant gene with incomplete penetrance. Males and females are both carriers of the disorder. The ratio of male to female patients in cases studied was 2 to 1.

Regli[4] finds evidences of the same symptom in several members of one generation. He notes that the distal parts of the upper extremities are mostly affected but also reports six cases involving facial muscles

and six families with mirror movements of the feet and toes. Reference is also made to a interesting case of synkinesia of the eye and the tongue described by Levy.

Mirror movements have similarly been observed in patients with spastic paresis, extrapyramidal disorders, lesions of the parietal cortex, phenylketonuria, Friedreichs' ataxia and skeletal abnormalities of the craniocervical region.[5-10] A patient described by Haerer and Cuvrier[1] suffered from a life-long familial mirror movements, which persisted even after he became affected with severe flaccid hemiplegia. Bauman[5] reports six cases of patients exhibiting mirror movements and Klippel-Feil syndrome. One of these six patients had an aunt who was similarly affected.

Gunderson[11] narrates the result of an autopsy on an 11 year old boy with mirror movements and Klippel - Feil deformity in which no pyramidal decussation could be identified in the cervical region.

Abercrombie[8] has described several methods for the observation of mirror movements but these only apply to visible movements. Baird (11) in an electromyographic study of 13 individuals with Klippel-feil syndrome, whose ages ranged from 5 to 22, discovered some degree of synkniesia in the hands of 10 of them. One of the 13 in the control group gave an atypical single diphasic spike.

The etiology of this disorder is still unknown. Haerer[1] indicates that Drinkwater is of the opinion that mirror movements is the persistence of the infantile-type motor acts.

Ipsilaterally projecting fibers of the pyramidal tract are known to be present in several species including monkeys and man.[12] A lack of ipsilateral corticospinal fibers resulting in an inhibitory function on motorneurones or an excess in ipsilateral corticospinal fibers with the result of an overly excitatory function on motorneurones are two alternative hypotheses explaining the occurrence of mirror movements.[4]

Summary

A ten year old girl showing mirror movements of the hand since birth has been presented along with a review of the literature related to this syndrome.

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