Mirror movement

Mirror movements are unintended movements occurring on one side of the body that mirror the contralateral voluntary ones. It has been proposed that mirror movements occur due to abnormal decussation of the corticospinal pathways. Using detailed multidisciplinary approach, we aimed to enlighten the detailed mechanism underlying the mirror movements in a case subject who is diagnosed with mirror movements of the hands and we compared the findings with the unaffected control subjects. To evaluate the characteristics of mirror movements, we used several techniques including whole exome sequencing, computed tomography, diffusion tensor imaging and transcranial magnetic stimulation. Computed tomography showed the absence of a spinous process of C5, fusion of the body of C5-C6 vertebrae, hypoplastic dens and platybasia of the posterior cranial fossa. A syrinx cavity was present between levels C3-C4 of the spinal cord. Diffusion tensor imaging of the corticospinal fibers showed disorganization and minimal decussations at the lower medulla oblongata. Transcranial magnetic stimulation showed that motor commands were distributed to the motor neuron pools on the left and right sides of the spinal cord via fast-conducting corticospinal tract fibers. Moreover, a heterozygous missense variation in the deleted in colorectal carcinoma gene has been observed. Developmental absence of the axonal guidance molecules or their receptors may result in abnormalities in the leading of the corticospinal fibers. Clinical evaluations and basic neuroscience techniques, in this case, provide information for this rare disease and contribute to our understanding of the normal physiology of bimanual coordination [1)].

1)
Solmaz B, Özyurt MG, Ata DB, Akçimen F, Shabsog M, Türker KS, Dalçik H, Algin O, Başak AN, Özgür M, Çavdar S. Assessment of the corticospinal fiber integrity in mirror movement disorder. J Clin Neurosci. 2018 Jun 12. pii: S0967-5868(18)30651-9. doi: 10.1016/j.jocn.2018.06.001. [Epub ahead of print] PubMed PMID: 29907388.