

How could differing brain lesions and secondary muscle/tendon alterations affect hand surgical treatment outcomes in cerebral palsy?

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Cerebral palsy (CP) is defined as a motor impairment caused by a brain lesion occurring during gestation or up to the age of two. Different parts of the brain are susceptible to damage during certain time-frames during development, so, e.g., early lesions affect hand function differently than late lesions. Also the extent of the damage affects hand function. Because of brain plasticity, large lesions result in a shift from a contralateral to an ipsilateral motor control of the hand. However, due to a probable subsequent disintegration of the sensory function, the hand function will be impaired. Brain lesions not only alter the motor control of the hand, eventually the structure of muscle, tendon and other tissues in the hand and arm will change, often resulting in contractures that interfere with function. The regenerative potential of the muscle has also been shown to be altered in CP. Hand surgery, with the aim of balancing the hand and improving function, has thus a variable effect on function depending on the type of brain lesion and the level of muscle control. Weakness, spasticity, regenerative capacity, inextensibility of muscles and tendons (contractures) are also important factors that influence surgical results. Preoperative knowledge about these factors may improve surgical outcomes.