SY-001-Experience in Using C7 Transfer to Treat BPI and Treat the Hemiplegic Hand after Central Nerve Injury

Jiang Su, Wendong Xu, Jianguang Xu, Yudong Gu

Department of Hand Surgery, Huashan Hospital, PR.China

Nerve transfer is one of the most popular and effective methods to treat brachial plexus injuries, here we report the experience in Huashan hospital in treating BPI by transferring contralateral C7. Also, the ipsilateral C7 nerve transfer for the treatment of C5-C6 avulsion was discussed.

The cerebral plasticity after contralateral C7 transfer is interesting. We demonstrate a long-range inter-hemispheric plasticity in patients who had received contralateral C7 transfer. The positron emission tomography (PET) results strongly support the concept that a new kind of long-range functional rearrangement of neural pathways in the CNS occurred after the contralateral C7 transfer. Besides, we evaluate changes of cortical reorganization after repair of the median nerve with the contralateral C7! root transfer after establishing the profile of cortical reorganization in whole BPAI on rats. We find that the motor cortical reorganization occurred in a time-dependent trans-hemispherical reorganization after the contralateral C7 root transfer for repair of the median nerve in BPAI while the sensory cortical reorganization in an intra-hemispherical reorganization. The findings from this study demonstrate that brain involves in the functional recovery after BPAI and repair with contralateral C7 nerve transfer. The results suggested that in reaching the goal of performing coordinated, complex movements, cerebral plasticity may play a decisive role, which should be studied further.

By studying the cerebral plasticity after contralateral C7 nerve transfer in BPAI rats, we demonstrated that ipsilateral motor cortex was capable of controlling both the affected and healthy hand following the peripheral cross-neurotization. Accordingly, we hypothesize that contralateral C7 nerve transfer might be effective in treating the hemiplegic hand after central nerve injury, and results from preliminary animal experiments strongly testified our idea. Inspired by this discovery, we performed the operation of this technique on the patient suffering from central nerve injury since 2007. Three hemiplegic patients with different types of central nerve injury (central nerve system infection, stroke, fetal distress) had been treated by contralateral C7 nerve transfer. Favorable clinic outcomes, laboratory as well as imaging results have been expected in all patients during our follow-ups. This is a novel procedure that using peripheral nerve rearrangement to treat the hemiplegic hand after central nerve injury.