

## THE RELATION OF PATIENT SATISFACTION AND FUNCTIONAL AND COSMETIC OUTCOME AFTER CORRECTION OF THE WRIST FLEXION DEFORMITY IN CEREBRAL PALSY

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**Wrist flexion deformity in cerebral palsy is treated with flexor carpi ulnaris to extensor carpi radialis brevis transfer. The aim of the study was to assess the outcome of this procedure and analyse the determining factors for patient satisfaction. Fifteen patients were reviewed after a mean follow-up of 23 months. The functional and cosmetic outcome and patient satisfaction were evaluated using patient rated scales. There was a strong and significant correlation between the cosmetic outcome and patient satisfaction, but there was no significant correlation between functional improvement and patient satisfaction. When analysing the cosmetic outcome in relation to the time since surgery, there was a decrease in the patient rated improvement over time. It seems that patient satisfaction is mainly determined by the cosmetic result, but the improvement, or the perception of it, tends to diminish over time. Fourteen out of 15 patients felt that the procedure was worthwhile and eight of them felt that the result was good or excellent.**

**Keywords:** cerebral palsy, spasticity, tendon transfer, wrist flexion deformity, cosmetic outcome, functional outcome, patient satisfaction

### INTRODUCTION

Cerebral palsy is caused by a non-progressive lesion of the immature brain. It results in movement disorders, typically spasticity, weakness and impaired fine motor control (Chin et al., 2005). The brain injury occurs mostly in the perinatal period, but can occur at any time after conception or in the early years of childhood. Common causes are prematurity, intrapartum asphyxia, cerebrovascular accidents, traumatic injuries and encephalitis (Lawson and Badawi, 2003; Waters and Van Heest, 1998).

In the upper limb the typical pattern of deformity is elbow flexion, forearm pronation, wrist flexion, finger flexion and thumb-in-palm deformity (Zancolli, 2003). The pronation and wrist flexion deformity is mostly caused by a spastic pronator teres (PT) and flexor carpi ulnaris (FCU). Because of the longstanding flexion deformity of the wrist, the flexor tendons shorten due to myostatic contracture and the extensor tendons lengthen. Usually the finger and wrist extensor muscles are weak as opposed to the spastic flexors (Zancolli et al., 1983). Various combinations of contributing factors in different degrees lead to a highly variable clinical presentation.

A well-established approach to correct the pronation–flexion deformity is by transferring the spastic FCU to

extensor carpi radialis brevis (ECRB) (Green, 1942; Green and Banks, 1962). This provides wrist extension and some additional supination (Gschwind, 2003). If supination is still insufficient, a pronator teres release or rerouting can be done. When the wrist is rebalanced to a more neutral and extended position, the balance of the finger flexors and extensors also changes. If finger flexion was weak, it will become stronger. If the flexor tendons were short, they will become even tighter. If the extensor tendons were weak or attenuated, they will become even weaker. This can lead to an improved grip, but impaired release, which is equally important. There are two ways to address this problem and the choice seems to depend on the surgeon's preference. The first is to weaken the flexor tendons by aponeurotic release, fractional lengthening or Z-lengthening (El-Said, 2001; Tonkin and Gschwind, 1992; Van Heest, 2003b; Zancolli, 2003; Zancolli et al., 1983). This will weaken the grip, but allow release. The second is to reinforce the finger extensors by either transferring the FCU to extensor digitorum (ED) instead of to the ECRB (Eliasson et al., 1998; Hoffer et al., 1986; Nylander et al., 1999; Samilson and Morris, 1964). That will enable the extensor tendons to overcome the antagonist flexors.

It has not been established which one of these general approaches produces the best results. There are several