Muscle Tetanic Contraction Force Measurement

Biceps muscle tetanic contraction force decreased with the more injury of the C7 nerve: Group A showed 36.40±3.79g (72%), Group B 32.65±12.40g (70%), Group C 30.72±9.76 g (55%) and Group D 17.88±14.16 g (32%). Statistically significant differences (p<0.001) could be seen when compared to the healthy side of 50.29±12.65 g. Statistically significant differences between the experimental groups were seen between Groups A/C, A/D and B/D, with p<0.035.

Electrophysiologic Testing

Electromyography of the biceps muscle after stimulation of the musculocutaneous nerve on the operative and nonoperative sides were performed (Table 1). In the operative side, it showed low amplitudes in Groups C (30"Crush) and D (60"Double Crush), with an average of 2.82±0.58mV (50% of healthy side) and 2.38±0.89mV (44%), respectively. Group B (10"crush) scored 3.81±0.90mV (64%) and Group A (no crush) 4.05±0.37mV (83%). These results were statistically significant (<0.05), compared with those of the healthy side (Group H = 5.56±0.82mV). Statistically significant differences between the experimental groups were observed between Groups A/C, A/D and B/D with p<0.046.

Axon Counts

Axon counts of healthy C7 spinal nerves (Table 2) were, on average, 1413±380.04. Axon counts of the musculocutaneous nerve (MCN) distal of the coaptation site in Group A were 626±163.4; Group B 529±169.1, Group C 425±284.5 and Group D 603±191.7. Though substantial differences existed between the groups, they are not statistically significant (p=0.055). Statistic significant correlation was only observed between axon counts and muscle contraction p=0.024.

Conclusion

An injured but macroscopically normal-looking ipsilateral C7 can still be used as a motor source to restore function. The result is directly proportional to the severity of injury, potentially implying that better results will be achieved when longer regeneration time is allowed.