

GAIT ANALYSIS IN A PATIENT WITH FEMORAL NERVE INJURY : A CASE STUDY

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INTRODUCTION

This study was performed to report the functional recovery about walking ability in a pediatric patient with femoral nerve injury.

METHODS

The subject was eleven year old child whose femoral nerve was injured when a broken wood stick penetrated his right thigh. The first gait experiment was performed the forty seventh day after the accident and then, he was given physical therapy everyday. Next experiment for examination was performed every month until 516th days from the onset. The VICON 612 movement analysis system (Oxford Metrics. Ltd.), consisting of 6 infrared cameras with sampling at 120Hz, was utilized for acquisition of kinematic data. Four force plate forms (2 AMTI, U.S.A; 2 Kistler, Switzerland) synchronized with the VICON system were used for measurement of kinetic data. Surface electromyographic data were acquired with the 10-channel MA-300 EMG system (Motion Lab Systems, Inc.) interface. Gait parameters, joint angle profiles, and EMG envelopes normalized over the gait cycle were arrived at by means of the VICON Clinical Manager software. Bilateral kinematic and EMG activity of the rectus femoris, vastus medialis, biceps femoris, gastrocnemius, anterior tibialis were collected.

RESULTS AND DISCUSSION

The subject had a disability in knee extension and sensory loss in anterior aspect of thigh and knee joint at first experiment.

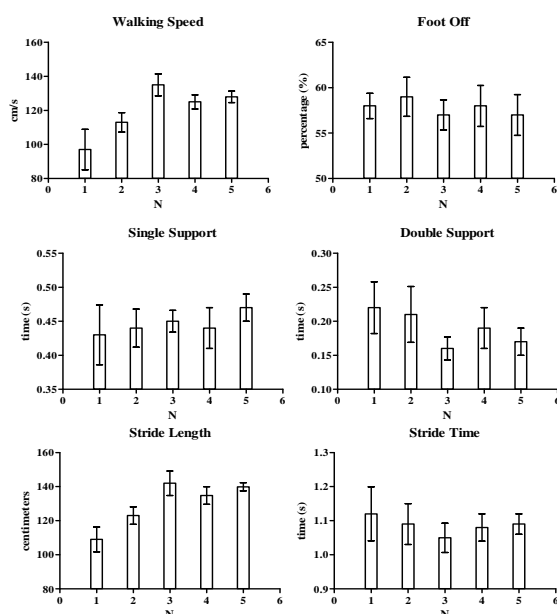


Figure 1: Temporal-spatial parameters on the right foot.

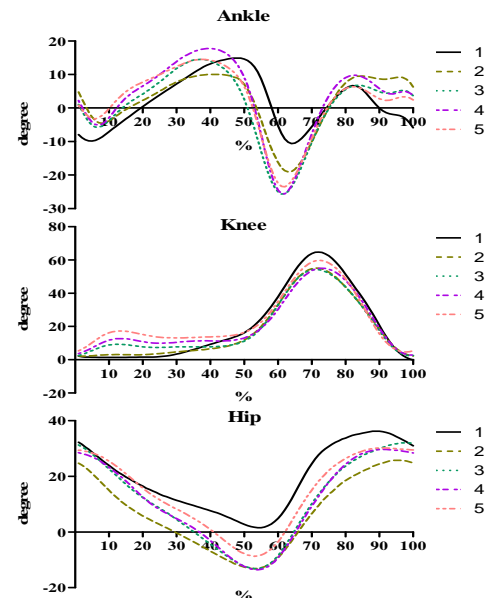


Figure 2: Ankle, knee, hip joint angles on the sagittal plane.

The gait analysis results on the affected side were shown in figure 1 (1 is the first result and 5 is the last result). The numbers in x axis represent the experiment order with four month intervals. The mean walking speed, single support, stride length increased after the 265 days from the onset. The variation was decreased from the first examination to the last examination in the all parameters, except the foot off, as time goes. The kinematic improvements could be observed in the figure 2. Lower limb joint angles in the sagittal plane recovered the normal pattern after the 516 days from the onset (the fifth experimental result). Ankle dorsi-flexion range during push-off and hip flexion range during stance phase increased. Knee flexion range at the early stance increased and recovered the normal pattern.

CONCLUSIONS

In the case of early teenager with peripheral neuropathy, gait ability improvement could be quantify from the three dimensional motion analysis.

ACKNOWLEDGEMENTS

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