

Abstract

Title:

Measurement and analysis of postural stability and movement patterns of persons after transfemoral amputation.

Objectives:

The aim of this work is to understand the compensatory mechanisms arising after femoral amputation and to find out what effect the length of amputation has on movement patterns in humans after transfemoral amputation and exarticulation in the knee joint.

Methods:

In my work I used the method of analysis and method of comparison. For the analysis of postural stability, I used standard tools: force plates (Kistler 9286A) and motion recording system (Kistler 9286A). To compare kinematic one-dimensional data, I used the technique of statistical parametric mapping, which is a generalization of classical statistical tests from scalar to one-dimensional data. 8 probands with transfemoral amputation participated in the study. Three successful attempts were recorded, at three speeds with the contact of a residual and amputated limb. The movement of the pelvis in the horizontal, sagittal, transverse planes and the time spent on a residual limb were analyzed.

Results:

We found that the length of amputation significantly effects postural stability and movement patterns. It was found that the shorter the amputation stump, the less stable the gait, with greater deviations in the pelvic rotation, in the sagittal, horizontal and transverse planes. Subjects also spent more time on a healthy limb.

Keywords:

Analysis, removal, balance, step, pelvis, rotation, kinematics, kinetics.

