




Design and construction of a wrist rehabilitation device for people with carpal Tunnel syndrome

Poster Presentation

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Abstract

Background: Carpal Tunnel Syndrome is one of the most common neurological disorders (neuropathy) in the hand, which is caused by compression of the median nerve in the wrist. The use of mechanical rehabilitation equipment can facilitate and improve the quality of rehabilitation programs.

Purpose: The objective of the study was to design and construction of a wrist rehabilitation device for people with carpal Tunnel syndrome.

Methodology: This device was designed in accordance with the advantages and disadvantages of existing devices to wrist rehabilitation. First, the initial design of the device was designed in Catia software and then it was made according to the designed sizes of the laboratory sample. The main body of the device was made of iron. The device consisted of a vertical bar made of iron. The bar had a bend that could be placed on the hand. At the top of the bar was a horizontal iron plate. There were holes for connecting the springs on the horizontal plane. Adhesive rings were placed on the fingers to attach the tension and compression springs to them.

Results: This device allows flexion and extension movements of the fingers to be performed forcefully. In this study, using springs with three different stiffness coefficients, the amount of force in flexion and extension movements can be increased up to about 30N (3 kg). The amount of force can be increased according to the individual's ability. Weak resistive forces are used in the design of mechanical devices to prevent further inflammation of the wrist.

Conclusions: An important feature of this device is to prevent the movement of the wrist while moving. In carpal tunnel syndrome, the wrist should be fixed and the fingers should perform flexion and extension movements. Keeping the wrist steady reduces inflammation. Doing strength exercises on the fingers, strengthens the flexor and extensor muscles of the wrist.

Keywords

design; Construction; wrist rehabilitation device; carpal Tunnel syndrome

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