Constraint-induced therapy for brachial plexus injury: case report

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Introduction

Injuries of the peripheral nervous system can lead to motor and sensitive consequences, generating occupational and functional hazard for individuals. Brachial plexus injury (BPI) is the lesion of multiple anterior nerve cords from the cervical and thoracic region, directly interfering with the upper limb function and brain progressively suppresses the use of the affected extremity, phenomenon also known as learned non-use. Constraint Induced Therapy (CIT) implements a technique that aims to re-integrate the affected arm in the performance of Activities of Daily Living (ADL) and could reduce, in BPI, the learned non-use. CTI is a strategy to treat and promote a better use for the upper limb, by encouraging its use, while not using the normal limb. Three fundamental principals guide the CTI: intensive trainning and repetition of tasks 3h daily, for 2 weeks; normal limb restriction during 90% of the awake time; behavioural methods to transfer from therapeutic to every day life the bennefits of the therapy.

Materials and methods

A 55 year old male, that was victim of a firearm projectile that injured the left brachial plexus in 2008, underwent routine rehabilitation during the years that followed the accident. Once we detected that there was no progression in recovering function of the left upper limb, and based in few cases that showed bennefit with CIT for BPI of obstetric causes, we decided to try CIT for this patient. Patient was submitted to a 13 days protocol, from 16/02/2016 to 28/02/2016, not trainning on the weekend only, making 3h sessions of CTI and then, did a 12 month follow up. A glove was used to limit the left upper limb and it was only removed for hygiene and sleeping. It was used 3 kinds of “shappings” (method in wich the motor objetctive is reachead by the graduation and flexibility of the complexity of the tasks) with 1 progression parameter and 2 tasks practice (Figs 1 and 2). In this trainnig period, The results were assessed by Motor Activity Log (MAL), Wolf Motor Function Test (WMFT).

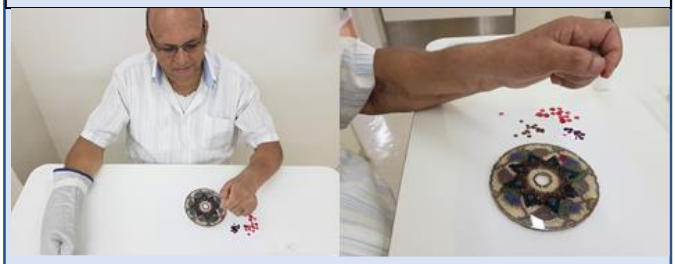
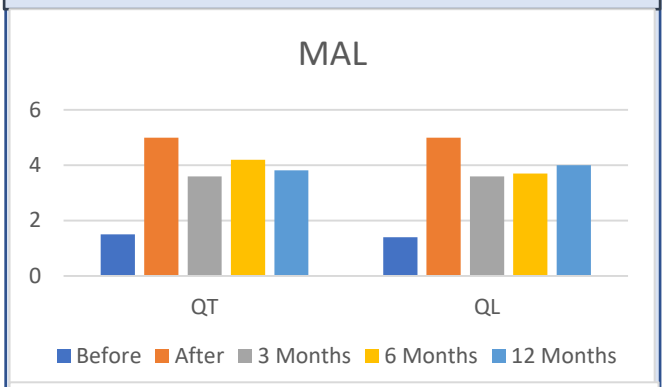


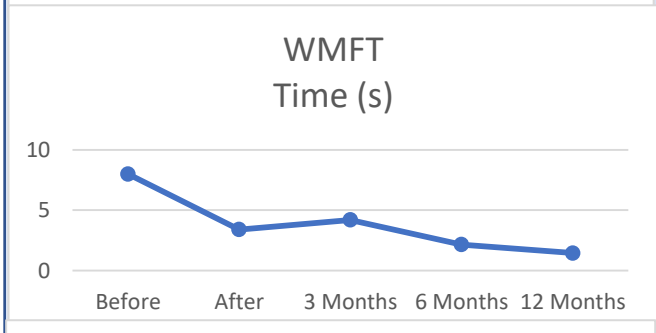
Fig. 1 – CTI Activities

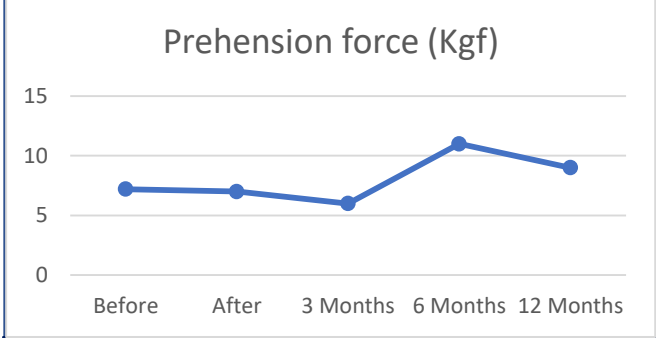
Fig 2 – Task sequence developped by the patient

Results

In the initial evaluation, patient scored a mean of 1.5 (quantity) and 1.4 (quality) in MAL and in the WMFT he had a mean of 8 seconds per task, functional ability mean score was 3.8 and hand prehension was 7.2kgf. In our last assessment (12 months after therapy), he scored a mean of 3.81(quantity) and 4.0 (quality) in MAL, and in WMFT he had a mean of 1.46 seconds per task, functional ability mean score was 4.2 and hand prehension was 9.0 kgf (data shown below).







Conclusions

CTI could be an inexpensive, fast and useful tool for BPI after firearm injury of the brachial plexus, even after 8 years of lesion.

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