International Journal of LatestResearch in Engineering and Management" (IJLREM)
ISSN: 2456-0766
www.ijlrem.org Volume 3 Issue 7 ǁ July 2019 ǁ PP 01-05

Process of Recovering the Motor Functions of a Tetraparese Patient

Muresan D-A[1], Arghir M[2], Grosu E-F[3]

Abstract: This paper presents the recovery process of a tetraparesis patient, who started after a Guillain-Barre syndrome for which the specific physiotherapy techniques necessary to recover the motor deficit were carried out, givenin the current section in the paper.
Keywords: GuillainBarre Syndrome; Tetra paresis; Physiotherapy; Recover; Rehabilitation.

1. Introduction

"Guillain-Barré syndrome is an autoimmune disorder encompassing a heterogeneous group of pathological and clinical entities. Antecedent infections are thought to trigger an immune response, which subsequently cross reacts with nerves leading to demyelination or axonal degeneration. Both intravenous immunoglobulin treatment and plasma exchange have been found to be equally beneficial." (Seneviratne U, 2000)

In this case, the patient was diagnosed with this syndrome after few days which meant a high motor deficit.She was unable to mobilize the upper limbs, trunk and lower limbs. Because of the respiratory insufficiency, the patient was intubated mechanically, requiring tracheostoma and in the same time gastrostoma in order to be fed.She followed a long period of specific and systematics daily exercises aimed at recovering the whole body.

Huber 360 has been used for patient assessment when she had the orthostatic position, enough musclestrength and the risk of fall has been reduced. The balance platform has seven specific tests: Stability, Unipodal, Walking, Limit of stability, Restriction of mobility, Strength of upper limbs, Coordination of upper and lower limbs.

2. Objectives

Through the application recovery procedures were sought methods to obtain a good range of motion, and the results of applying the procedures were highlighted using the balance platform with seven programs of stability and balance assessment, named HUBER 360.

3. Methods

3.1. Passive mobilization, bed mobility and communication

The first stage of recovery started in the Anesthesia and Intensive Care department of the Emergency Clinic Hospital in Cluj-Napoca, the patient being unable to mobilize the upper limbs, trunk and lower limbs. Because of the respiratory insufficiency, the patient was intubated mechanically, requiring tracheostoma and in the same time gastrostoma in order to be fed.

The patient benefited daily passive mobilizations for the whole body to maintain the range of motion and to reduce muscle shortening.

Until the patient had the necessary strength muscle and good bed mobility it was necessary to change the patient`s position to a maximum of 3 hours to avoid pressure ulcers and other complications. Also, she wore intermittent pneumatic compression devices for avoiding deep vein thrombosis.

[1]Dorin-Alexandru Muresan(e-mail: alex.d.muresan@gmail.com)
Dept. of Sport and Physical Education Science. Babes – BolyaiUniversity of Cluj-Napoca. / Drd / Romania.
[2]Mariana Arghir (e-mail: marianaarghir@yahoo.com)
Department of Mechanical Engineering System, Technical University of Cluj-Napoca / Em. Univ. Prof. Dr. Eng./Romania.
[3]Emilia-FlorinaGrosu (e-mail: emiliaflorina.grosu@gmail.com)
Dept. of Sport and Physical Education Science. Babes – BolyaiUniversity of Cluj-Napoca. / Univ. Prof. Dr. / Romania.

It was very difficult to know the patient`s needs because she could not speak. The communication between patient and physiotherapist was possible using only lower limbs after few weeks from accident. She wrote words with the aid of foot.

3.2. Recovery treatment and independence in wheelchair

The second stage, when the patient can breathe alone without being ventilated mechanically in which the patient started the treatment at the Recovery Hospital in Cluj-Napoca, being transportable in a wheelchair. In this stage she could sit of the bad and transfer to the wheelchair, we were able to start recovery at the physiotherapy room where we have more recovery materials and we could do more exercises.

Given that the patient stayed a long time in bed, we started by strengthening the muscles and also stretching exercises for passing to the next stage, the orthostatic position.

For this step, we used a complete equipment and manual therapy; equipment: verticalization table, standy, walking frame.

Figure 1. Lifting the patient progressively in orthostatic position using verticalization table

3.3. Independence in orthostatic position

The third stage of kinetic treatment was designed so that the patient reaches the highest possible level of independence. In this stage the patient could support the orthostatic position, but with difficulty. We started with reeducation of balance and walking with aiding devices. After few weeks we started to walking at the treadmill with support at the upper limb, suspension weight training, balance training using Huber 360 and Bossu Ball, different type of materials to improve the strengthening muscle and balance.

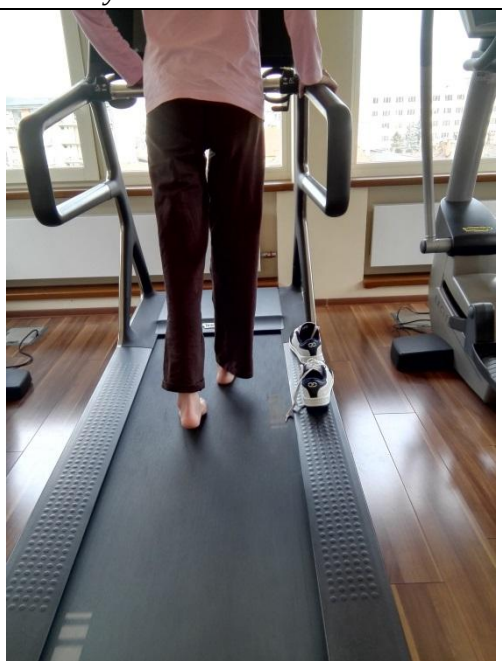

Figure 2. Walking at the treadmill

4. Results

After the recovering program were applied, which lasted for a year and four months, the patient was recovered because she showed the following: Muscle strength was much improved in the trunk, lower and upper limbs; The patient walks on her own, without aiding devices and without supervision; She can write, eat, paint, run and swim on her own; She returned to work and she is an arts teacher again.

Results from the Huber 360 platform are presented in below figures. This study showed the evolution of patient from July 2017 to January 2018.

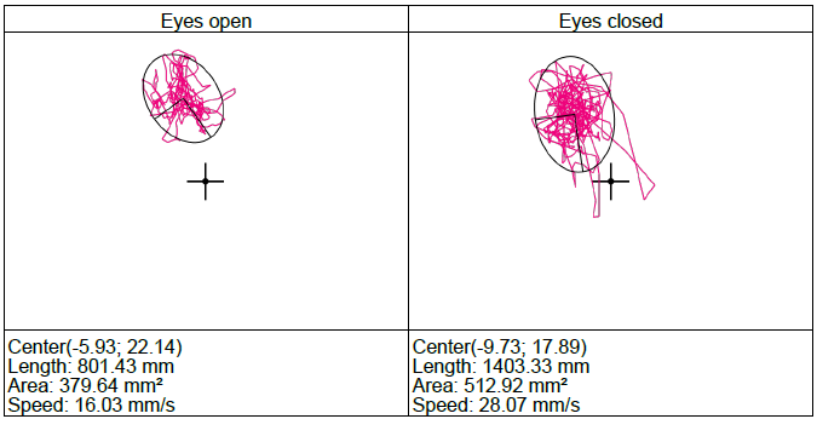

Figure 3.Patient Stability at Start of Investigation. It is presented the initial state of the patient's stability, which is presented and spread over a large surface.

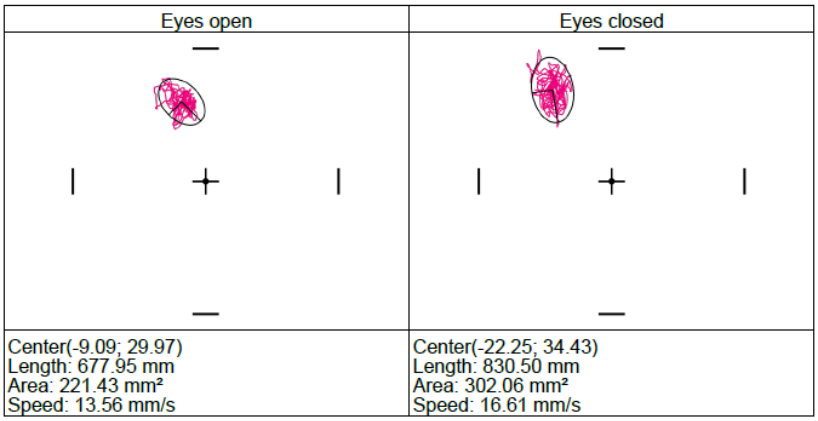

Figure 4.Patient Stability at the End of Treatment.The stability of the patient is greatly improved, the surface is narrowed and closer than in the initial phase compared with Figure 3.

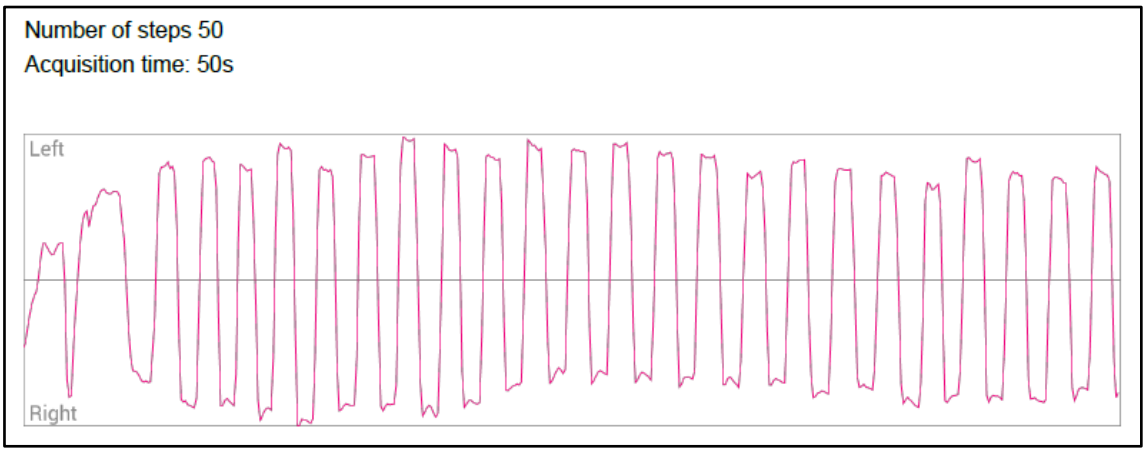

Figure 5.Stato-dynamic analysis, Trasfer of body weight and Walking pace.Initial test. There is a greater strength muscle of left lower limb than right lower limb. The patient could do fifty numbers of steps in fifty seconds.

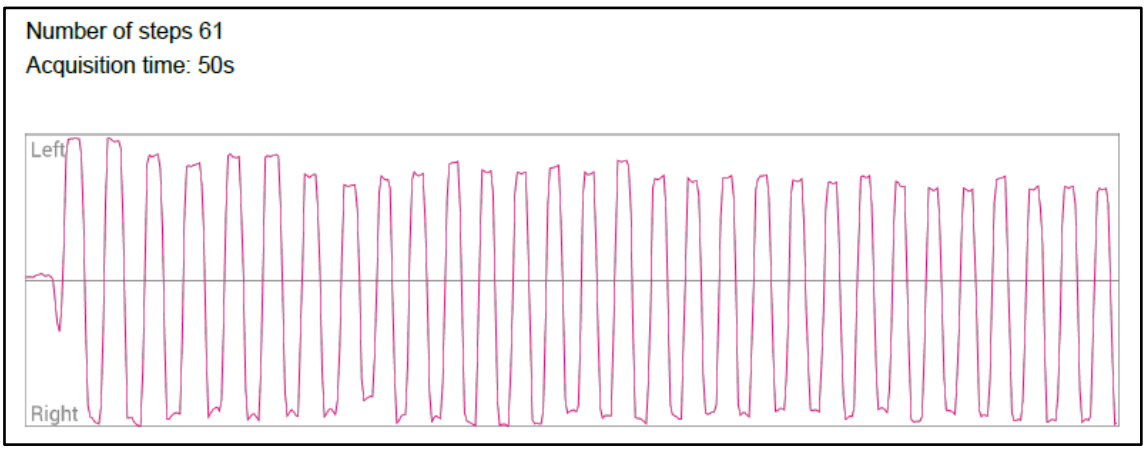

Figure 6.Stato-dynamic analysis, Trasfer of body weight and Walking pace.Final test. The strength muscle of lower limbs is relatively equal.

From Figure 5 and Figure 6, we can see the evolution of patient using the number of steps over a determined period. The difference between the two tests is eleven steps on fifty seconds.

Figure 7. Patient Initial Test Progression

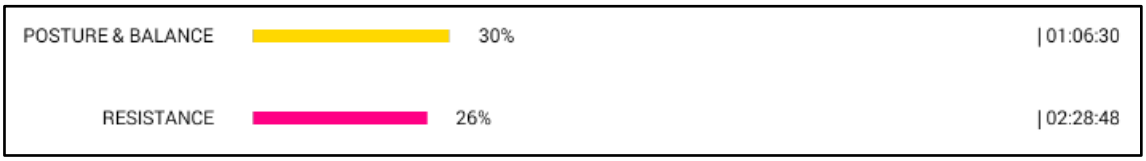

Figure 8. Patient Final Test Progression

This last two figures show an improvement in posture, balance andresistance of about ten percent.

5. Conclusions and perspectives

The treatment applied may be continued until the patient is fully recovered.

The patient manages to coordinate her movements, she can move and execute different activities without being supported by appliances.

The procedure for recovering the patient in the three stages succession was smooth, and the succession was well applied; the Huber 360 platform confirmed that because it gives us the necessary comparable results.

All these results are dueto the entire treatment.

Figure 9.The patient on Huber 360. She continues the recovery process.

The major perspective is to continue the recovery process for maintaining strengthening muscles, balance and a healthier life.

The aim of this paper was to demonstrate the benefits of specific rehabilitation treatment due to a neurological disorder, starting from the debut phase to independence.

References

[1]. B. Maertens de Noordhout MD, F. Houlmont PT, Y. Léonard PT, R. Cornea MD, S. Adam (2015) PhD Centre Neurologique et de Réadaptation Fonctionnelle de Fraiture, BELGIUM

[2]. S. Fabri , A. Duke, A. Constantinides, Y. Pereira-Durif, T. Mark, F. Lacaze (2017) SpecializedRehabilitation Center, 15, avenue du Professeur Grasset, 34080 Montpellier, France

[3]. Fabre J. B., Martin V., Borelli G., Fritsch N., Theurel J. (2017) *ESP-Consulting, Research Department Mimet, France; Laboratory of Exercise Biology (EA 3533), Blaise Pascal University Clermont Université, Aubière, France*

[4]. Seneviratne U (2000) Guillain-Barré syndrome. In: Postgraduate medical journal. *76*(902):774-782.