

A complex Neuro-Locomotor rehabilitation case of a patient with politrauma associated with multiple complications/sequela – Case Report

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Abstract

This paper, approved by the bioethical commission no. 9181/11.04.2018, features a complex case of post polytrauma case; this is a severe condition entailing multiple anatomic lesioned structures – at least one of them life-threatening² – that provoke morphofunctional and social disability¹ and, we can assert this case as a politrauma. **Materials and methods:** 68 years-old female patient, admitted in multiple occasions in our Clinic’s Division for a quadriplegic type of motor dysfunction, sphincter disorders, numbness, tingling, and pricking sensations, sensitivity to touch, dysarthria and severe locomotor and self-grooming dysfunction. The functional incapability was caused by the multitrauma – multiple cranial fractures including the viscerocranium, partial focal seizures, C6 vertebra body and from T11 to L1 spine fractures, pelvic ring breach, and calf bones displacement-with multiple surgeries adjoined to a treated rheumatoid arthritis. At first admittance, the patient was bedridden with retention type neurogenic bladder and urinary catheterization and recently operated sacral bedsore. During the repeated hospitalizations, the patient suffered complications typical for her condition: multiple urinary tract infections, sacral bedsore and superficial venous thrombosis, all of them being successfully approached and treated by a multidisciplinary team. The clinical and functional evaluations were objectified through the assessment scales/scores: AIS, FIM, QoL (Quality of life), Asworth, FAC, and WISCI II³. **Results:** The patients’ evolution was favorable with improved results in all the assessment scales/scores. She had an increased motor control and muscular strength growth on all levels, now she can perform sitting position without any help, standing and sitting exercises at trellis, achieve the initialization of few steps with support by the kinesio-therapist and perform between the parallel beams around 5 steps. Her dysarthria, mood – initially/organic depression – and related behavior, improved her motivation on continued rehabilitation is now positive. **Conclusions:** This case represents a suggestive example for the poly-traumatized patients admitted in our Clinics’ Division and the complex approach of each pathology in the wright time for the improvement of the specific neuro-locomotor impairment and the quality of life of our patients.

Key words: *politrauma, rehabilitation, physical therapy,*

Introduction

Polytrauma is a severe condition entailing multiple anatomic lesioned structures – at least one of them life-threatening¹ – which provoke morphofunctional and social disability². Many patients who suffer from vehicle accidents have not only one condition which needs urgent attention, but two or more potentially life-threatening ailments, which must be addressed in a specific order, depending on the severity of the patients and the hospital procedures and protocols. Surgical procedures should be performed in the first 5 to 10 days since trauma, to prevent complications, such as the development of sepsis and multiorgan failure and physicians should have a precise algorithm to ensure the perfect timing for measures to increase the patients’ health condition³. Polytraumatic patients have a higher necessity of medical care in hospital units, because they tend to have a larger period of admittance, a much higher probability to be transferred in the intensive care units and all over a higher mortality rate than other patients⁴.

Disclaimers: The patient consented for her clinical and paraclinical parameters to be presented in this case report, as well as to be photographed and filmed, signing an informed consent document. This case report was approved by the Bioethics Committee of the Teaching Emergency Hospital “Bagdasar-Arseni” Bucharest, Romania (No. 9181/11.April.2018).

Case presentation: A 68 years-old female patient is admitted in multiple occasions in our Neuro-locomotor Rehabilitation Clinic’s Division for the following complaints: a quadriplegic type of motor dysfunction, sphincter disorders, numbness, tingling, and pricking sensations, sensitivity to touch, dysarthria, severe locomotor and self-grooming dysfunction.

In the pathological background, the patient had Rheumatoid Arthritis treated with methotrexate and an auto vehicle accident (pedestrian hit by a car, May 2016) which caused: Severe Traumatic Brain Injury (TBI) - multiple cranial fractures including the viscerocranium (nasal bone, right zygomatic bone);

partial focal seizures; Spinal Cord Injury (SCI) - C6 vertebra body and from T11 to L1 spine fractures; multiple bone fractures - pelvic ring breach and calf bones displacement - with multiple surgeries; retention type neurogenic bladder with urinary continuous catheterization; multiple urinary infections and recently operated sacral bedsore.

History of the disease: The patient was admitted to our Clinic's Division in multiple occasions, following admittances first to the Emergency Unit and then to orthopedic and neurosurgery clinics for evaluation or surgical interventions: TBI, SCI, pelvis consolidated fracture, right calf bones open fracture – operated in May 2016, December 2016 with external fixation, 23 January 2017 - removal of the external fixator and replacement of the metal plates, 29 of June – K wire dynamization. At first admittance, the patient was bedridden, with severe motor disfunction, retention type neurogenic bladder and urinary catheterization (consequently having numerous urinary tract infections) and recently operated sacral bedsore. Also, the patient had dysarthria and a psycho-emotional status – organic depression.

Clinical examination at admission: The general state of the patient was equilibrated from a cardiovascular, respiratory, digestive and renal point of view. Arterial Tension = 120/80 mmHg. Pulse = 70 b/sec. Oxygen saturation = 96% - spontaneous. Second degree excoriation on the right heel, scar from previous sacral excoriation surgery – healed. Slow bowel movement.

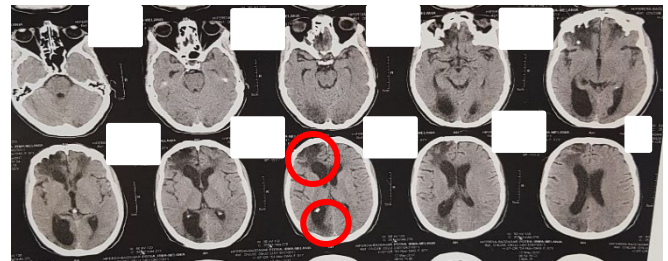
NMAK examination: Patient was aware, partially cooperant and had space and time orientation, normal pupillary reflexes, left lateral homonymous hemianopsia, symmetrical facies, quadriplegia more pronounced on the extremities, globally diminished osteotendinous reflexes. Functionally, the patient-maintained bedrest and could not sustain sitting position, unless assisted, at the left leg there was a minute movement – muscular strength 2 out of 5 on the AIS motor scale. Retention type neurogenic bladder and urinary catheterization.

Also, the patient was examined through the following assessment scales/scores implemented in our Clinic's Division: ASIA (American Spinal Injury Association Impairment Scale)⁵, FIM (Functional Independence Measure)⁶, QoL (Quality of Life) (Flanagan completed by Burckhard)⁷, FAC (Functional Ambulation Category)⁸, WISCI II

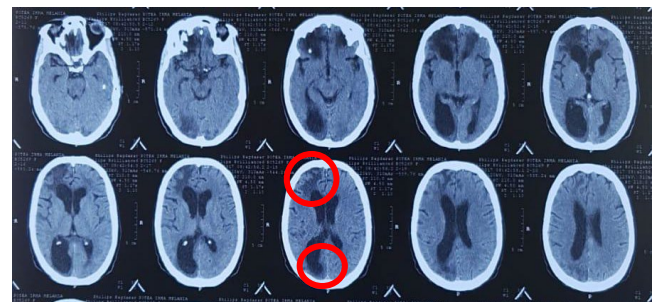
(Walking Index for Spinal Cord Injury)⁹ and MMSE (Mini Mental State)¹⁰.

Paraclinical examination: Relevant for the diagnosis and case evolution are the following paraclinical results:

Cerebral CT-scan: cortical and subcortical bilateral frontal and right occipital sequelae hypodensity, which tractions and dilatates the lateral ventricles, reduced in a period of 7 months. (Figures 1 and 2)



May 2017 - (Figure 1 – Cerebral CT – scan from the files of “Bagdasar-Arseni” Hospital)



December 2017 - (Figure 1 – Cerebral CT – scan from the files of “Bagdasar-Arseni” Hospital)

X-ray: right calf bones fracture, surgically stabilized with plates and screws. (figure 3 and 4)

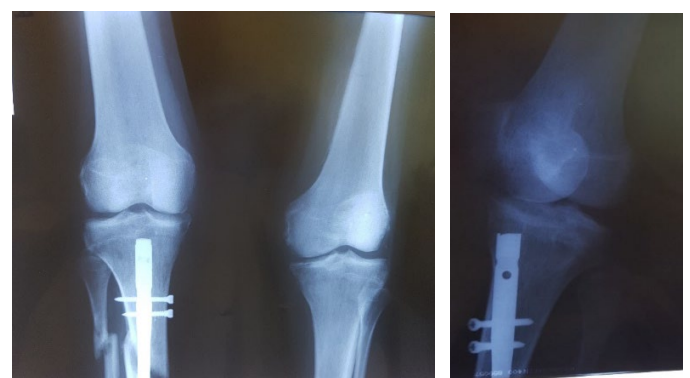


Figure 3: bilateral knee x-ray showing right calf bones fracture, surgically stabilized with plates and screws

Figure 4: profile right knee x-ray showing right calf bones fracture, surgically stabilized with plates and screws

Based on the patients' background, the clinical and para-clinical parameters taken into consideration, the diagnosis was established: Severe AIS/Frankel C quadriplegia after cervical-thoracic-lumbar SCI (vertebral C6, T11-L1 fractures) and after severe TBI (multiple cranial fractures at viscerocranium level), psycho-emotional status (organic depression) and communication disability (dysarthria) in a polytraumatic context (pelvic consolidated fracture, right calf bones open fracture – operated in May 2016, December 2016 with external fixation, 23 January 2017 - removal of the external fixator and replacement of the metal plates, 29 of June – K wire dynamization) after a car accident (pedestrian hit by car – May 2016).

Management and Outcome:

After establishing the patients diagnose we decided on the rehabilitation objectives individualized for this patient according to her needs to complete de rehabilitation program:

- Increase of mobility and performance of assisted or independent walking
- Learning and habituating new adapting movements depending on the functional deficiency
- Preventing short-term complications (thrombophlebitis, bedsores, respiratory complications, urinary infections) and depression
- Re-adaptation and training of the functional movements and functional possibilities and acceptance of the new way of life
- Increase the ADL and IADL independence

During her multiple hospitalizations, the patient received the following medical treatment: Platelet antiaggregant, Lipid-lowering drugs, Gastric protection drugs, NSAID, Tonic vascular drugs, Neurotrophic drugs, Anticonvulsant drugs, Antivertigo drugs, Anxiolytic drugs, Antidepressants, Antibiotics – for multiple urinary tract infections accordingly to the antibiogram.

Evolution: After multiple admissions, the negativity of the patient started to decrease after multidisciplinary approach of her depression and started to feel confident enough to actively participate in the rehabilitation program. The patient started to use the upper limbs and was able to write and perform precise movements. After her calf bones consolidations, the patient was able to stand up and maintain with little support her position, was

able to stand up with support and perform a few steps with intense assistance from the kinesio-therapist. Also, the dysarthria improved gradually until the patient could speak fluently. An ongoing impediment in the patients' rehabilitation program was the constant and excruciating headache caused by the traumatic brain injury and consequently by the partial focal seizures. With multiple electroencephalographic examinations and consulting each time with the neurologist could the treatment be adjusted and personalized to the patients' need to minimize the migraine episodes and further to continue with the rehabilitation program.

The patients' evolution on each of the assessment comparative scales/scores was improved considerably: AIS (American Spinal Injury Association Impairment Scale): First Admission = 222, Last Discharge = 301; FIM (Functional Independence Measure): First Admission = 47/126, Last Discharge = 55/126; QoL (Quality of Life) (Flanagan completed by Burckhard): First Admission = 80/112, Last Discharge = 100/112; FAC (Functional Ambulation Category): First Admission = 0/5, Last Discharge = 2/5; WISCI II (Walking Index for Spinal Cord Injury): First Admission = 0 /20, Last Discharge = 3/20; MMSE (Mini Mental State): First Admission = 23/30; Last Discharge = 26/30.

For the treatment of the patient, a multidisciplinary team of doctors helped to improve the patients' condition: Neurorehabilitation physicians, Psychiatrist, Psychologist, Neurosurgeon, Orthopedic specialist, Neurologist, Infectious disease specialist, Plastic surgeon, Cardiologist.

Case particularity: The particularity of this case consists in what the effect of the polytraumatism had on the motor ability of the patient. The tetraparesis from the TBI, the tetraplegia – later evolved in tetraparesis from the cervical and thoracic-lumbar SCI and the leg traumatism which had to be operated in multiple occasions caused a vicious cycle resulting in a prolonged bedrest and an incapability to start mobilizing and verticalizing the patient which also had a major impact on her psychic, causing a depression.

Another particularity of the case was the delicate approach of the fragile psychic of the patient which is as important as the medical treatment in the rehabilitation program. The patients' negativity due to her depression slowed down the rehabilitation

process and it was crucial to convince the patient to actively participate and collaborate with the whole rehabilitation team and have a lot of patience in order to expediate her improvement. It is another example of the importance of the collaboration of the medical doctor, kinesiio-therapist and other members of the health-care providers' team in order to successfully apply a rehabilitation program.

Conclusions: This case represents a suggestive example for the poly-traumatized patients admitted in our Clinics' Division and the complex approach of each pathology in the wright time for the improvement of the specific neuro-locomotor impairment and the quality of life of our patients..

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