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Case Report

Can late functional rehabilitation be an obstacle in the recovery of stroke sequelae ? Extraordinary improvement in a severely disabled patient

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Abstract

Rehabilitation is one of the most useful ways of treating patients who have suffered a stroke. Its precocity in the management of patients often allows having a good functional prognosis. In case of a sequela stroke complicated by and significant comorbidities, functional recovery is difficult. Despite this we are surprised to have a convincing result. We report a case of sequelae of a straight stroke complicated by right transtibial amputation in a 57-year-old patient over two years after the accident. The initial assessment found a bedridden patient with significant musculoskeletal impairment. After ten months of follow-up requiring the intervention of a multidisciplinary team, the final assessment revealed a significant functional recovery, despite the persistence of some difficulties limiting the total autonomy of the patient.

Introduction

Stroke is the leading cause of acquired disability worldwide [1] and amputation a source of severe disability [2]. Rehabilitation care is the basis for functional recovery from deficits. According to several authors [3], to have an optimal recovery from deficits, rehabilitation should start as soon as possible, generally within the first 6 months, or at the latest before the first year after the stroke. Some patients are sometimes seen in sequelae with other associated comorbidities. The literature review does not take into account the functional prognosis of patients treated late after a stroke. The authors report here the satisfactory result of a patient who has lost his autonomy following a transtibial amputation contralateral to the after-effects of a stroke after one year of his accident.

Clinical observation

He is a 57-year-old patient, father of a 15-year-old girl, hypertensive and type II diabetic, non-alcohol-tobacco addict, divorced, lives with his mother in the family home. He suffered a right ischemic stroke in February 2014 responsible for left spastic hemiplegia and benefited from a right transtibial

amputation in December 2015 caused by an acute ischemia infected in the big toe. Having become bedridden one year after amputation, He was hospitalized in the rehabilitation center with the aim of resuming walking in order to resume gardening which was his passion and to visit his friends.

On admission, the general condition was well preserved, the blood pressure figures at 160 / 95mmHg. The physical examination found neuro-orthopedic deformities, the most disabling of which are summarized in Table 1.

Table 1: Initial articular balance sheet.

Motion Joint	Flexion and Extension	Abduction and Adduction	External rotation Internal rotation	cubital/radial Inclinaison and Inversion/Eversion
Shoulder	55°/5°	60°/30°	10°/0°	-
Elbow	140°/-90°/-25°	-	-	-
Wrist	45°/-15°/60°	-	-	-15°/0°/5°
Hipe	85°/-25°/-5°	10°/15°	0°/0°	-
Knee	95°/-40°/-20°	-	-	-
Ankle	25°/-20°/-10°	-	-	20°/-15°/-5°

He also suffered from bilateral scapulargia assessed at 5/10 on the pain evaluation scale, which made it difficult to carry out manual movements and gestures in everyday life.

The Medical Research Council (MRC) motor control assessment scale, found a 1/5 order in the left ankle, in the knee, in the hip and overall, in the muscles of the left upper limb. 3/5.

On the non-pelagic right side, the testing of the driving force by the HELD and WORTHINGAM scale, found the strength to 4/5 for both members. For spasticity, the modified Asch worth scale rated it 3/4 to the left forearm, wrist, leg, and ankle extensor flexors. Sensitivity disorders were marked by hypoesthesia of the left hemi-body and hyperesthesia of the right stump.

The evaluation of cognitive functions with the Mini Mental State Examination found a score of 17/30 and the measure of functional independence at 32/126. The biological assessment had objectified chronic renal failure with a creatinine clearance at 30 ml / minute and poorly balanced diabetes.

The brain scan asked during the hospitalization showed an old lesion of an ischemic stroke in the territories of the right Sylvian artery.

The professionals were doctors, nurses, physiotherapists, occupational therapists, orthoprosthesis and speech therapist.

The main rehabilitation techniques used during this management were the prevention of bedsores, the passive and active mobilizations, postures and stretching for joint amplitudes recovery and prevention of osteoarticular disorders, the strengthening of weakness muscles; botulinum toxin injection for spastic muscles, progressive verticalization, the tibial prosthesis manufacturing and gait rehabilitation, grips and coordination of the left upper limb have also been rehabilitated.

He also received psychological and neuropsychological support to facilitate his adherence to the various treatments offered.

Stabilization of high blood pressure, diabetics and kidney failure was an integral part of care during the stay.

Results

Doctors regularly assessed the patient clinically and functionally, prescribed needed drugs and rehabilitation technics, injected botulinum toxin in spastic muscles, coordinated the para medical team included physiotherapist, nurses, occupational therapist speech therapist and the orthoprosthesis.

The efforts of the multidisciplinary team highlighted that at the end of the hospitalization:

The spasticity was reduced to 1+ / 5 in the lower limb and 2/5 in the upper limb, having led to a recovery of joint amplitudes. Table 2 summarizes the amplitude of the various joints at the end of hospitalization.

Table 2: Final articular balance sheet.

Motion Joint	Flexion and Extension	Abduction and Adduction	External rotation and Internal rotation	Cubital/radial inclination and Inversion/Eversion
Shoulder	120°/10°	80°/35°	10°/55°	-
Elbow	160°/-25°/0°	-	-	-
Wrist	65°/-15°/60°	-	-	-5° /0°/10°
Hipe	100°/0°/10°	20°/15°	0°/10°	-
Knee	155°/-25°/0°	-	-	-
Ankle	25°/-20°/-10°	-	-	45°/-10°/10°

The scapulargia improved on the pain evaluation scale which fluctuated between 0 and 2/10 depending on the time.

On the motor level, an improvement in the motor control of the lower left limb from 1/5 to 3/5 distally and 3/5 to 4/5 proximally was observed with no disturbance in sensitivity. The mini mental state examination score varied by only one point during the stay, going from 17/30 to 18/30, clinically evidenced by the importance of disorders of orientation, attention, and memory.

The new motor and joint results now made it possible to carry out trans-ferts, the unipodal standing position as well as handling the wheelchair over approximately 500 meters. Walking with a tripod cane became possible on a perimeter of 50 meters from the reception of the tibial prosthesis.

Discussion

The early functional rehabilitation of the after-effects of stroke allows a good rehabilitation of the functional independence of the patients. In certain situations, good management, even late, with significant sequelae allows better recovery of motor skills. The case of our patient, with his adherence to his care following explanations and encouragement by the therapists, illustrates the importance of multidisciplinary rehabilitation several months after the paralysis. Indeed, he suffered from a left hemiplegia, then grabatized for a long time following a transtibial amputation on the healthy side. Several authors report [4], the improvement of disability through early adapted multidisciplinary rehabilitative care.

The treatment of neuro-orthopedic deformities depends on their causes [5]. In the case of our patient, the botulinum toxin injections and the stretching allowed the recovery of the amplitudes of the joints. Botulinum toxin is the best treatment for focused spasticity [6]. In our patient, the decrease in spasticity had increased the motor control of the left lower limb. Mailhan L, et al. [7], had shown that the reduction in spasticity of the sural triceps allows good motor control of the foot lifters and an improvement in the progress of the step. An early recurrence of spasticity from the second month post injection was observed in our patient. This can be explained by the diffuse nature of the spasticity or the insufficient doses of toxin injected.

As in our patient, adaptation pain between stump and prosthesis was frequently reported in amputees [8]. They are

associated with fatigability and cognitive disorders that limited the resumption of walking. In a series reported by Chung, et al. [9], 75% of stroke patients have cognitive impairment as reported in our patient. These factors are often a limiting factor in the recovery of motor functions. Several authors [10], have highlighted the importance of a vigilant human environment, adequate accommodation, the implementation of care and technical aids at home in the social support of these patients.

Conclusion

We report here the case of a severely disabled patient who has positively regained acceptable autonomy in carrying out activities of daily living. Patients with several handicapping deficits require special care. Multidisciplinary support focused on the patient's interest can have optimal results even in some patients seen late.

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