

Rehabilitation in a patient with recent diagnosis of dementia: the physiatrist and the geriatrician compared in taking charge of a case report

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KEYWORDS

Spinal surgery;
Rehabilitation;
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ABSTRACT

The rehabilitation of a patient suffering from multiple comorbidities and locomotor disabilities was a difficult task from which the physiatrist does not shy away. The rehabilitation work was even more complex when a new diagnosis of dementia is added to these problems. An elderly patient with numerous comorbidities was hospitalized for spinal surgery and subsequently suffered from infectious complications. In fact, he underwent T12-L1 decompressive laminectomy surgery due to a stenosis of the spinal canal at the T12-L1 levels with myelopathy which was already manifested itself in the past with weakness in the right lower limb and presence of worsening lumbocruralgia with impaired walking. The patient was referred to have rehabilitation programs to regain his independence. However, during his hospitalization, he showed clinical signs that led to a suspected diagnosis of parkinsonism. Subsequently, he was diagnosed with cognitive impairments with frontotemporal dementia. A Parkinson-plus syndrome, also called atypical parkinsonism, is referred to a group of neurodegenerative movement disorders that resemble idiopathic Parkinson's disease with certain distinguished clinical and pathophysiological features. In this regard, we described a clinical case report in which the skills of the geriatrician and those of the physiatrist were called upon to collaborate closely to take charge of this complex patient.

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Introduction

While there is experience, despite many doubts, regarding the benefits of physical activity and physiotherapy on the cognitive effects of individuals suffering from dementia^(1,2), there is little evidence on the physiotherapy protocols in these patients who present with pathologies of physiotherapy relevance⁽³⁾. Taking care of these patients still constitutes a major challenge today that puts the knowledge and skills of the various professional involvements. This paper describes a complex clinical case that came to our attention due to rehabilitation problems, which led to a new diagnosis of a previously unrecognized dementia, which constituted a challenge in which psychiatrists and geriatricians faced.

Methods

Clinical history

An elderly patient, aged 88 years old, with childhood polio and a past medical history of glaucoma, had left knee prosthesis due to knee osteoarthritis (2016), osteosynthesis in left femur fracture (2017) and osteosynthesis with intramedullary nail for right femur pertrochanteric fracture (2018). The patient underwent decompressive laminectomy at T12-L1 due to spinal stenosis with myelopathy. The spinal cord damage manifested itself with lumbocruralgia, weakness in the right lower limb, and walking difficulty, whereby the lesion was initially unrecognized due to the effects of childhood polio. However, the laminectomy operation was subject to infectious complications, i.e., epidural collection with moderate compression on the dural sac. Thus, the patient needed a revision of the thoracolumbar epidural surgical wound with mostly epifascial collection evacuation. Then, the general and neurological conditions were improved with antibiotic therapy.

Upon the start of the intensive rehabilitation program, the patient appeared with quite alert, partially cooperative and oriented in the three axes, and generalized hyponotrophy in arthrosis

pattern. The patient was dependent in basic and instrumental activities of daily life (ADL and IADL), with the need for moderate assistance in postural transitions and transferring. He assumed the sitting position for a few seconds due to early fatigue, and was unable to stand upright or walking.

Treatments and progression

We initially set up an individual rehabilitation project (PRI) aimed at preventing secondary damage from hypokinesia and maintaining joint excursion. In addition, the treatments aimed to improved muscular strength of the lower limbs, as well as trunk and pelvis control to promote sitting position, and independent in the various ADLs and IADLs. The patient remained haemodynamically stable, eupnoeic at rest in room air and afebrile, with the absence of significant internal medical complications. However, he showed a progressive and rapid vigilance and cognitive function decline with a decrease in motor functional status.

Upon subsequent re-evaluation during a week later, he appeared disoriented and apathetic with very little verbal and motor initiative. He also presented obvious signs of parkinsonism with marked rigidity and diffuse bradykinesia, dystonic attitude of the neck. There was also the presence of a fine tremor of the right upper limb. There was no clinical improvement after a five-day treatment with rotigotine before and only slight improvement was observed with levodopa. Therefore, since we suspected a form of parkinsonism plus syndrome, we decided to perform Magnetic Resonance Imaging (MRI) for the patient (Figure 1). The data showed striking signs of regressive-atrophic cortico-subcortical manifestations with prevalent symmetrical and bilateral involvement of the frontal and temporal lobes, with associated signs of leukoencephalopathy on a chronic vasculopathic basis. The images also document widespread and bilateral regressive cortico-subcortical alterations in both cerebral hemispheres, with prevalent involvement of the frontal and temporal lobes.

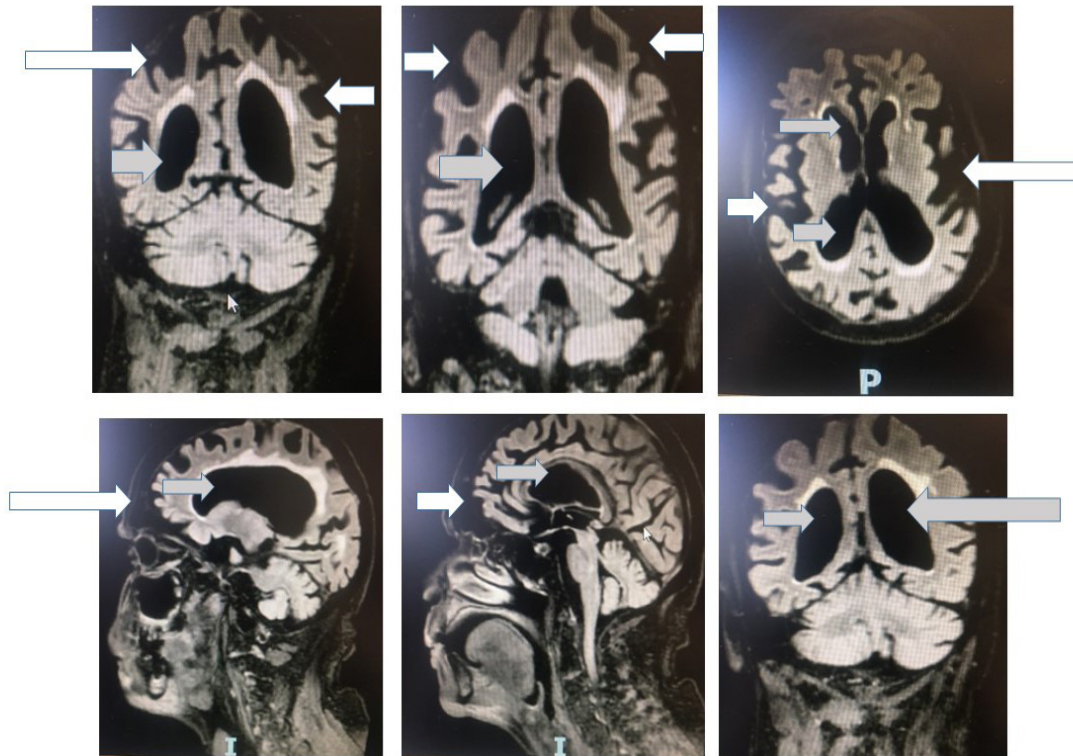


Figure 1 Brain Magnetic Resonance Imaging (MRI) with Field Echo, Fluid Attenuated Inversion Recovery, Diffusion Weighted Imaging, 3D T1-weighted volumetric sequence, Susceptibility Weighted Angiography/Imaging (SWAN), and Magnetization Prepared Rapid Gradient Echo (3D MP-RAGE) sequences, according to multiple planes, of the patient. The arrows highlight the areas of regression at the cortical and subcortical levels in both cerebral hemispheres. It is clear, highlighted by the arrows, how these regressive alterations are present especially at the frontal and temporal levels bilaterally. The arrows also highlight the dilation of the ventricular system and the Sylvian cisterns and the periencephalic CSF spaces bilaterally.

We referred the patient to receive neuropsychological tests. The findings revealed the presence of multiple deficits, especially regarding planning, with absence of cognitive flexibility, working memory and inhibition, and voluntary responses, indicative of a deficit in executive functions on the dorsolateral prefrontal cortex⁽⁴⁻⁷⁾. Consequently, the patient was diagnosed with parkinsonism-plus syndrome in behavioural variant of frontotemporal dementia (bvFTD). Thus, the rehabilitation goals were set to preserve remaining ADLs for as long as possible, managing disability and quality of life, and adapting to the (often very rapid) progression of the disease.

Subsequently, the PRI was intensified with assisted active kinesitherapy and exercises for the recovery of strength of the four limbs, pelvic girdle, trunk stability, and balance control while sitting. In addition, the patient received training programs for postural changes and safe transfers, along with the nursing assistance in the elementary daily activities. During hospitalization, the PRI was provided to also ensure partially active range of motion of the upper and lower extremities scapulo-humeral, elbow and wrists (due to concomitant arthrosis), right and left shoulder flexion limited to medium grades with mild pain symptoms. Thereafter, there was a slight improvement in the

muscle strength deficit of the hip flexors (strength from 1/5 of the Medical Research Council or MRC) at the beginning of the PRI to 2/5), the hip adductors and abductors (from 2/5 to 3/5 MRC), the knee flexors and extensors (from 1/5 to 2/5 MRC), the triceps surae (from 2/5 to 3/5 MRC), the anterior and posterior tibialis muscles (from 1/5 to 2/5 MRC). Similar findings were also observed in the left lower limb. Muscle tone was partially recovered in both lower limbs, in the absence of objective sensitivity deficits. We then set up a pharmacological therapy with vortioxetine 20 mg, zopiclone 7.5 mg, pregabalin 150 mg, esomeprazole 40 mg, enoxaparin 4000 IU and tamsulosin 0.4 mg, ensuring hydration for 24 hours.

Finally, we informed the family members about the patient's condition, the possibilities of recovery, the maintenance of residual functions and progression of the dementia pathology, with the consent of a family member and appointing a support administrator. Then, we proceeded to prescribe all aids to facilitate recovery in the patient's home care with the initiation of home physiotherapy services. Finally, we planned serial monitoring for executive functions using neuropsychological tests (with preferential choice on the Clock Drawing Test, the attentional matrices test, the Phonemic and Semantic Verbal Fluency Test and the apathy evaluation scale).

Discussion

The described case report places emphasis primarily on the need for close collaboration between physiatrist and geriatrician for appropriate treatments of the patient. Parkinson-plus syndrome, also called atypical parkinsonism, refers to a group of neurodegenerative movement disorders that resemble idiopathic Parkinson's disease with certain distinguishing clinical and pathophysiological features⁽⁴⁾ (Table 1). The clinical signs associated with the poor response to anti-parkinsonian therapy had increased our suspicion, confirmed by the imaging findings. Frontotemporal dementia (FTD) is a neurodegenerative disease that accounts

for up to 10% of middle-age-onset dementias and entails a social, economic, and emotional burden for the patients and caregivers⁽⁵⁾. Approximately 40% of people with FTD report a family history of dementia, motor neuron disease or parkinsonism, and half of these familial cases are attributed to genetic mutations. For this reason, we explored the anamnesis in the subject's family tree^(6,7). There is no significant scientific evidence regarding the conduct to be followed in the rehabilitation of patients suffering from dementia and orthopedic problems. The majority of publications concern individuals with femoral fracture (which was however present in our patient as a previous pathology) and with less than brilliant results^(8,9). A study by Poletti et al⁽¹⁰⁾ highlights the value of neuropsychological tests that allow early identification of the deficits affecting cognitive functions, in particular executive functions, connected to the prefrontal cortex. Neuropsychological tests can also demonstrate the extent to which cognitive functions are maintained or improved, providing a more concrete evaluation of the rehabilitation's efficacy⁽¹¹⁾. To our knowledge, there is no study reporting effectiveness of rehabilitation protocols of an individual suffering from FTD with disabilities of osteomuscular etiology that increases burdensome and complexity for the rehabilitation process of the patient. In addition, the behavioural variant of frontotemporal dementia (bvFTD) is characterized by changes in personality and social interaction, loss of empathy placing the individual in a condition where he is no longer able to look after himself not only from an ADL and IADL point of view, but precisely as a legal person. In fact, the behavioral symptoms of bvFTD can have legal implications. Loss of social control, profound apathy, repetitive or compulsive behaviors, changes in appetite, a marked reduction in empathy toward others—a whole range of unique behaviors—can have detrimental effects on patients and their families. For this reason, one of the tasks of the dementia physician is to address the legal aspects of behaviors induced

by a neuropsychiatric condition. In this clinical case, therefore, interviews with family members and counseling regarding the role of a family

member as a support guardian were part of our assessment, along with the clinical diagnoses and prognoses quoad vitam and quoad valitudinem.⁽¹²⁾

Table 1 Classification of parkinsonism plus syndromes⁽¹³⁾

<p>Sporadic</p> <ol style="list-style-type: none"> 1. Progressive supranuclear palsy (PSP) 2. Multiple system atrophy (Striatonigral degeneration) 3. Olivoponto cerebellar atrophy, Shy-Drager syndrome) (MSA), Cortical-basal ganglionic degeneration (CBGD) 4. Diffuse Lewy body disease (DLB) 5. Sporadic pallidal degeneration and related disorders 6. Bilateral striatopallido dentate calcinosis 7. Parkinsonism with neuroacanthocytosis
<p>Familial</p> <ol style="list-style-type: none"> 1. Associated with dementia <ol style="list-style-type: none"> a. Fronto temporal dementia and Parkinsonism linked to chromosome 17 b. Familial dementia with swollen achromatic neurons and cortico-basal inclusion bodies c. Familial diffuse Lewy body disease 2. Associated with psychiatric and respiratory disturbances 3. Associated with other types of movement disorders: <div style="display: inline-block; vertical-align: middle;"> $\left\{ \begin{array}{l} \text{a. Dystonia} \\ \text{b. Myoclonus and seizures} \\ \text{c. Others} \end{array} \right.$ </div> 4. Associated with eye movement abnormalities: <div style="display: inline-block; vertical-align: middle;"> $\left\{ \begin{array}{l} \text{a. Familial progressive supranuclear palsy} \end{array} \right.$ </div> 5. Others

Conclusion

Through a collaborative approach, a specialized healthcare team—comprising a physiatrist, geriatrician, physiotherapist, and nurse—achieved a precise diagnosis for a complex dementia patient, successfully preventing misclassifications that could have triggered severe clinical complications. Although the revised diagnosis revealed a challenging rehabilitation prognosis, targeted physical interventions successfully preserved muscle tone and trophism while preventing sarcopenia, bedsores, and life-threatening immobility. Ultimately, these clinical efforts enabled a safe return home, reinforced by essential adaptive equipment and multidimensional guidance designed to manage patient frailty and protect caregivers from stress and burnout. This singular case underscores the immense value

of integrating evidence-based protocols with experience-informed practice to guide multi-professional care for complex dementia populations.

Take home messages

Early recognition of Parkinsonism-plus is critical to avoid mistaking neurodegenerative postural deficits for mechanical spine issues, preventing unnecessary spinal surgery. Dedicated management by geriatricians and physiatrists ensures timely diagnosis, while tailored physiotherapy helps manage severe motor symptoms, reduce fall risks, and preserve patient independence and quality of life.

Conflicts of interest

The authors declare no conflict of interest.

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Author contributions

Magro VM served as the primary researcher and was solely responsible for conceptualization, methodology, clinical case management, and drafting the original manuscript, as well as its critical revision and final modifications.

Data availability

The datasets generated and analyzed during the current study are not available due to privacy reasons but are available from the corresponding author upon reasonable request.

Statement of ethics

This retrospective review of patient data did not require ethical approval in accordance with local/ national guidelines.

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