

Research article

Analysis of cognitive status during rehabilitation after hip arthroplasty associated with pre-existing knee arthroplasty on the same leg: Case Presentation

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Abstract: Introduction: Hip arthroplasty conducted through either cemented or cementless prostheses must alleviate pain and restore joint mobility and muscle strength. The main goal is to restore mobility, stability and to maintain ADL (Activities of Daily Living) within normal parameters. Current surgical techniques allow for state-of-the-art surgeries to be performed. Yet, the postoperative course is strongly influenced by both pre-and postoperative psychological factors, as well as by associated diseases.

Materials and Methods: We present the case of a 79-year-old female patient from Iasi, a retired yet still physically active gym teacher who was admitted an emergency to the Orthopedics Clinic of the "Sf. Spiridon" Emergency Hospital with a displaced left femoral neck fracture resulting from same-level fall. The patient had for 6 years a Scorpio-Stryker cemented knee prosthesis on the same leg. Through surgical intervention, a cementless bipolar Lépine prosthesis was inserted into the left hip. Then, the patient presented to the Department of Physical Medicine and Rehabilitation of the Iasi Clinical Railroad Hospital to receive an adequate post-operative rehabilitation program.

Results: The psychosocial factors have been analyzed with the help of various recent and specialized psychological scales. The obtained results confirm the fact that these factors significantly influence the rehabilitation of prosthesis-wearing patients.

Conclusion: Our study emphasizes the psychological impact on standing and walking rehabilitation in a patient with two prostheses on the same motor axis.

Keywords: Knee and hip replacement, Psychological factors, rehabilitation.

Introduction

Hip fractures are frequent among elderly persons – especially women – with most incidents occurring from same-level falls. The preferred orthopedic intervention is total hip arthroplasty (cemented, cementless, or hybrid), requiring a multidisciplinary team of physicians, psychologists, and rehabilitation doctor, to assist the patient over the postoperative rehabilitation period [1-3].

Materials and Methods

A 79-year-old urban woman was transferred to the Department of Physical Medicine and Rehabilitation of the Iasi Clinical Railroad Hospital to start a rehabilitation program after hip arthroplasty. Three weeks before her admission, the patient with known osteoporosis suffered trauma after a same-height fall, resulting in a displaced left femoral neck fracture requiring surgical intervention for the insertion of a cementless bipolar Lépine prosthesis.

Patient's medical history included cardiovascular diseases (grade III essential hypertension with high added risk, permanent atrial fibrillation, left bundle branch block, and aortic atherosclerosis). She also had a history of previous neurological conditions associated with cerebral atherosclerosis and a transient ischemic attack in 2014, as well as gastric cancer operated in 2012, all taken into account by the specialists.

On admission, the patient was fully conscious and oriented, in a good general state.

Cardiovascular system examination on admission

- arrhythmic heart beat with no pathological murmurs
- Central Pulse = 105 bpm, Peripheral Pulse=96 bpm
- Blood Pressure = 140/70 mmHg

Respiratory system examination on admission

- bilateral vesicular murmur present
- no signs of respiratory failure
- SpO₂ = 96% spontaneously

Digestive system examination on admission

- supple abdomen
- painless on superficial/deep palpation,
- liver and spleen within normal limits

Urogenital tract examination on admission

- impalpable kidneys
- physiological urination

Cranial nerves examination on admission

- normal

Muscle tone examination on admission

- hypotrophy and hypotony of left quad muscles
- reducible 10 degrees of left knee flex
- muscular force LEFT upper & lower limbs: proximal, intermediary, and distal MRC=2/5
- shortening of the lower left limb by 1,5 cm (measured from anterior-superior iliac spine to the internal malleolus)

Sensitivity examination on admission:

- discrete hypoesthesia of the left leg

Deep tendon Reflexes examination on admission:

- present symmetrically

The physical examination further revealed the following: standing and walking impossible with a walking frame, postoperative left leg edema, without trophic disturbances or pressure ulcers.

Functional evaluation

At the time of admission, the patient expressed severe anxiety and fear toward mobilizing the replaced left hip joint.

Throughout the rehabilitation process, important muscle power development has been made, considering the patient's MRC scores on admission in comparison to discharge. On admission, our patient

scored a 2 (Active movement, with gravity eliminated) for distal force in her left limbs and on discharge

she scored a 3 (Active movement against gravity).

Score and Description

0	No contraction
1	Flicker or trace of contraction
2	Active movement, with gravity, eliminated
3	Active movement against gravity
4	Active movement against gravity and resistance
5	Normal Power

Table 1. A schematic representation of MRC (Muscle Power Scale)

Paraclinical examination

Laboratory tests were within normal ranges throughout the hospital stay.

Knee (fig. 1) and hip (fig. 2) X-rays show prosthetic implants with no signs of fissure.

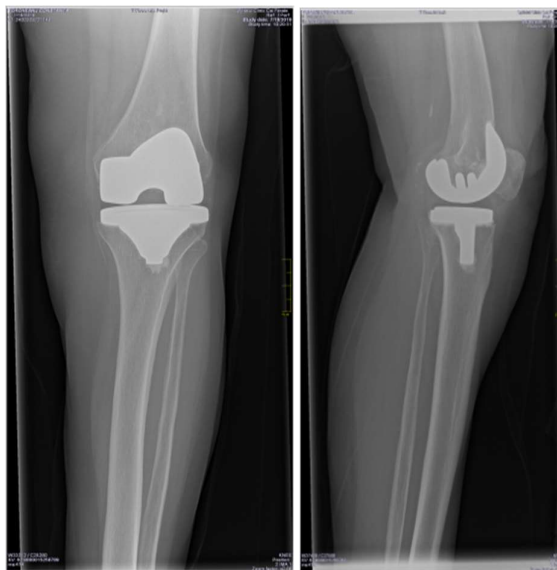


Figure 1. Knee prosthesis of the patient

Front view (A), side view (B)



Figure 2. Hip prosthesis of the patient

To analyze the psychosocial factors that could affect the rehabilitation outcomes, the patient completed a series of questionnaires both at admission and discharge. On the HADS (*Hospital Anxiety and Depression Scale*) [4], her results corresponded to a moderate level of depression and anxiety. Social support was measured with the aid of the ESSI (*ENRICHD Social Support Instrument*) [5], the findings of which suggest that her social surroundings would not have enough influence over her recovery. Another used scale was the RLOC (*Recovery Locus of Control*) [5], which measures the person's views regarding a return to his/her preoperative circumstances; our patient relied on the strength and support of others throughout her rehabilitation process. We have also analyzed the IPQ-R (*Revised Illness Perception Questionnaire*) [6], which quantitatively measures patient perception of his/her disease; our patient suffered from a psychoemotional blockage, further augmented by her fear of using her twice operated leg (knee and hip).

The rehabilitation protocol of our department aims at pain control, psychological support, prevention of acute and late complications, as well as the resumption of walking and standing by rapid mobilization, lower limb loading with appropriate weights, regular physical therapy, stretching exercises to prevent hip flexion contracture, strengthening of the muscle system, and the correction of body posture and balance. At the end of the rehabilitation period, we administered the same questionnaires as at admission. The results revealed a decrease in anxiety on the HADS [4] and an increased confidence in her strength after mobilization, according to the RLOC [5] and IPQ-R [6]. Throughout her hospital stay, the patient was taught how to care for and manage her prostheses (total hip and knee replacement). On discharge, she was encouraged to continue her rehabilitation program at home and the Slănic Moldova rehabilitation resort.

Results

The role of psychological consultations throughout the rehabilitation process of patients who underwent hip or knee arthroplasty is essential for their long-term health. Risk factor optimization (obesity, anemia, malnutrition, unstable cognitive status) and reevaluating the associated diseases pre- and postoperatively are necessary for therapeutic success. Anxiety and depression have a significant impact on rehabilitation, which can be changed preoperatively and throughout rehabilitation [4, 5, 11]. Social support also significantly influences the recovery of these patients; in our case, solitude did not determine any evident changes in the ESSi [5] analysis. The analyzed questionnaires assess the psychosocial aspects of patients on admission and discharge. These patients should fill in the questionnaires again 6 months and then 1 year after discharge, to monitor their patient's cognitive status.

Regarding the rehabilitation process post-arthroplasty (hip and knee replacements alike), studying the relation between the respective patients' expectations and satisfaction is crucial. Studies [6-10] show that post-surgery pain and functional status correlate with patients' satisfaction post-arthroplasty. Long term, however, we cannot study the relation between expectations and satisfaction without regularly consulting and keeping track of prostheses-wearing patients' cognitive statuses. [9].

In the case of our patient, a multidisciplinary team consisting of a physician, a doctor, and a psychologist had intervened. The psychological impact of the former knee prosthesis was affecting the recovery after hip arthroplasty on the same leg. The treatment included drugs for postoperative pain control, social support and individualized rehabilitation program. We believed it was necessary to educate the patient pre- and postoperatively, so that his/her expectations to correlate with the results expected during the rehabilitation. The major limitation lies in the reviewed papers. Most of the included studies were observational non-randomized studies as well as cross-sectional studies done with relatively small samples. This fact prevents conclusions of causality.

Conclusions

Our article highlights the importance of administering objective scales on admission and discharge after arthroplasty. It is essential to study the psychosocial and biomechanical factors, as well as psychological counseling during the recovery period. With these scales we can differentiate the patients who can receive rehabilitation kinesitherapy at home from those who need hospital admission. The particularity of our case is, on one hand, the fact that the patient had two prostheses (hip and knee) on the same leg, and the other hand the fact that, the psychoemotional impact of surgery greatly hindered her recovery. However, her biomechanics should have theoretically been sustained by her former profession (physical education teacher).

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