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CASE REPORT

Post-Hemiarthroplasty Rehabilitation - The Impact of Rehabilitation Nursing: case Report

Rehabilitación Post-Hemiartroplastia - El Impacto de la Enfermería de Rehabilitación: Informe de un caso clínico

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ABSTRACT

Introduction: the aging of the population increases the prevalence of falls, having a negative impact on the life of the person and their family. The Rehabilitation Nurse Specialist draws up functional motor re-education plans for people with femoral fractures who have undergone surgery, with the aim of improving functional independence and quality of life.

Objective: to describe the benefits of an FMR rehabilitation program for a person undergoing hip hemiarthroplasty at home.

Case Report: clinical case report in accordance with Equator's CAse REport guidelines. The information was collected through information systems and interviews, enabling a diagnostic assessment to be carried out and a care plan to be defined, in accordance with the available tools. After implementing a functional motor re-education plan, which included exercises, balance and gait training, significant gains were seen in muscle strength, body balance and the ability to walk with a walking aid, over the course of a month of intervention in a home setting.

Conclusions: the intervention of the Rehabilitation Nurse Specialist in the person undergoing hip hermiarthroplasty proved to be essential for the recovery of independence and functional capacity, as well as for the promotion of quality of life.

Keywords: Femur Fracture; Functional Motor Re-Education; Rehabilitation Nursing.

RESUMEN

Introducción: el envejecimiento de la población aumenta la prevalencia de caídas, repercutiendo negativamente en la vida de la persona y su familia. La Enfermera Especialista en Rehabilitación elabora planes de reeducación funcional motora para personas con fractura de fémur intervenidas quirúrgicamente, con el objetivo de mejorar la independencia funcional y la calidad de vida.

Objetivo: describir los beneficios de un programa de rehabilitación con FMR para una persona sometida a una hemiartroplastia de cadera en su domicilio.

Reporte de caso: informe de caso clínico de acuerdo con las directrices de Equator's. La información se recogió a través de sistemas de información y entrevistas, lo que permitió realizar una valoración diagnóstica y definir un plan de cuidados, de acuerdo con las herramientas disponibles. Tras la aplicación de un plan de reeducación motora funcional, que incluía ejercicios y entrenamiento del equilibrio y la marcha, se observaron ganancias significativas en la fuerza muscular, el equilibrio corporal y la capacidad de caminar con un andador, a lo largo de un mes de intervención en un entorno domiciliario.

Conclusiones: la intervención de la Enfermera Especialista en Rehabilitación en la persona sometida a hermiartroplastia de cadera demostró ser esencial para la recuperación de la independencia y la capacidad funcional, así como para la promoción de la calidad de vida.

Palabras clave: Fractura de Fémur; Reeducación Motora Funcional; Enfermería de Rehabilitación.

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INTRODUCTION

Ageing is characterized by the progressive loss of physical and mental capacity, increasing the risk of diseases and conditions such as frailty, incontinence, delirium, pressure ulcers and falls. In Portugal there has been an increase in the elderly population and a reduction in the young population, making it the country with the 4th highest rate of ageing in the world.[1,2]

Falls are a major public health problem due to their prevalence and impact on the lives of individuals, families and the community. Among older adults, physiological, behavioral and environmental changes, such as architectural barriers, are the key contributors to fall risks.[3] In 2022 alone, falls were the leading cause of admission to emergency departments in the Portuguese National Health Service.[4]

Hip fractures, particularly femoral neck fractures, are a frequent consequence of falls in older adults. These injuries disrupt the continuity of bone or cartilage and can be complete or incomplete. It is characterized by pain, deformity, inability to stand and abnormal mobility. Diagnosis is made by teleradiography, with CT or MRI indicated if inconclusive. In a femoral neck fracture, the trace extends from the region below the head to an internal point of variable height, causing shortening and external rotation of the lower limb. The treatment of choice is surgery, with hemiarthroplasty or total hip arthroplasty.[5]

The post-surgical period requires comprehensive rehabilitation to restore function, reduce complications and promote independence. The Rehabilitation Nurse Specialist (RNS) plays a central role in this process, particularly through the implementation of Functional Motor Re-education (FMR) programs. These interventions are designed to address identified rehabilitation needs, promote motor recovery, and improve the patient's quality of life.[6]

This case report aims to describe the impact of a structured home-based FMR program conducted by an RNS in the recovery of a person who underwent hip hemiarthroplasty. The case was selected for its illustrative value in highlighting how targeted rehabilitation interventions can promote functional autonomy in a real-world home care context.

CASE REPORT

The clinical case report follows the CAse REport (CARE) guideline. Data collection involved consulting the Clinical Record and the National Integrated Continued Care Network (NICCN) platform, a structured interview and a physical examination. Identified as Ms. M., she was informed about the study and signed an informed consent form.

Ms. M., female, 81 years old and retired. Personal history of hypertension, sarcoidosis and total right knee replacement. After being discharged from hospital, she lives with her daughter, her main carer, in a 3rd floor apartment, without an elevator and with stairs supported by a one-sided handrail. Home with carpets in circulation areas. Technical aids: tripod, toilet lift and articulated bed frame built into the bed.

She fell from her own height while walking with her daughter, resulting in a fracture of the femoral neck on the right. She underwent hermiarthroplasty via a posterior surgical approach. Referred to the NICCN and admitted to the Integrated Continued Care Team (ICCT) for promotion and continuity of the rehabilitation process. Prior to the fall, she was independent in carrying out Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs).

The diagnostic assessment was carried out on the first home visit by the RNS, on 21/05, using the following assessment tools:[7]

- Pain using the Numerical Pain scale.
- Muscle Strength using the Lower scale.
- Balance using the Simple Balance scale.
- Gait by the Holden Functional Gait Classification.
- ADL using the Barthel scale.
- IADL by the Lawton index.

Identified the Rehabilitation Nursing (RN) diagnoses and outlined a care plan in ICNP® language, based on the Documentary Standard of Nursing Care for the Specialty of Rehabilitation Nursing.[8]

The rehabilitation plan included one session a week for a month, with two sessions in the last week, for a total of five sessions. Pain and peripheral oxygen saturation were assessed at the beginning and end of each session. The exercises were carried out respecting the person's tolerance, pain threshold, joint range, planes and axes.

Table 1 shows the RN plan, with the intervention focuses, diagnoses, objectives, interventions and results.

Table 1. RN plan

Focus	Rn diagnosis	Objectives	Rn interventions	Results Evaluation – 24/06
Muscle movement	Decreased muscle movement in the lower limb	Increase muscle movement in the hip region; Improve muscle strengthening; Prevent dislocation and complications.	Monitor muscle strength using the Lower Scale. Perform active-assisted and active-resisted muscle and joint exercise technique for all lower limb segments - (1 to 3 sets of 10 repetitions); Encourage the person to perform active muscle and joint exercises - Self mobilizations.	Lower scale: Right Upper Limb: 3/5 Left Upper Limb :4/5 Right Lower Limb: 3/5 Left Lower Limb: 4/5

	Potential to improve knowledge of muscle and joint exercise techniques	Improve knowledge of muscle and joint exercise techniques.	Assess knowledge of muscle and joint exercise techniques. Teach muscle and joint exercise techniques. Teach about contraindicated movements in the posterior surgical approach (adduction beyond the sagittal midline, flexion >90º and internal rotation of the hip contraindicated).	Demonstrated
	Potential to improve ability to perform muscle and joint exercise techniques	Improve the ability to perform muscle and joint exercise techniques.	Assess the ability to perform muscle and joint exercise techniques; Instruct in muscle and joint exercise techniques: Isometric exercises in the lying position: isometric contractions of the glutes, hamstrings and quadriceps (1 to 3 sets - 10 repetitions); Isotonic exercises: Active-assisted mobilization of all lower limb segments, with an increase in the number of sets (1 to 3 sets - 10 repetitions) depending on tolerance. Active-resisted mobilizations: flexion/extension, hip abduction with an increase in the number of sets (1 to 3 sets - 10 repetitions) and resistance (0,5 kg to 1kg) depending on tolerance; Muscle strengthening exercises on the bed: therapeutic attitudes - bridge - 1 set of 5 to 10 repetitions; Exercises in fine motor skills: Exercise 1: thumb and forefinger in tweezers, grasp chickpeas and place them in a container; Exercise 2: thumb and forefinger in tweezers, grasp springs and place them on the rim of a glass (1 set of 10 repetitions for each finger); Train muscle and joint exercise techniques.	Demonstrated
Body balance	Compromised body balance	Improve dynamic sitting and (static dynamic) standing balance; Maintain body alignment.	Assessing body balance. Encourage maintaining body balance through postural correction. Perform balance training technique (static and dynamic) - 1 to 3 sets of 10 repetitions: Sitting dynamic balance exercise: with the person sitting, cause the person's shoulders to sway slightly to compensate for the movement. Standing static balance exercise: with the person standing, close your eyes. Standing dynamic balance exercises: getting up and sitting on the bed, abduction/adduction of the hip joint while standing with support, flexion/extension of the knee while standing with support and anterior and posterior displacement of the trunk. Monitor body balance using the Simple Balance Scale.	Balance: Simple Balance Scale Static sitting: Present Static standing: Decreased Dynamic sitting: Present Dynamic standing: Decreased
	Potential to improve knowledge of body balance technique	Improve knowledge of body balance techniques.	Assess knowledge of body balance techniques Teaching about body balance technique.	Demonstrated
	Potential to improve ability to use body balance technique	Improve the ability to perform body balance techniques.	Assess ability to perform body balance technique; Instruct on body balance technique; Train body balance technique.	Demonstrated
Walking with a walking aid (wa)	Potential to improve knowledge about home adaptation for walking with WA Potential to improve knowledge about walking with WA	Improve knowledge of home adaptation for walking with WA and knowledge of walking with WA. Promote functional independence. Promote correct and safe walking.	Evaluate knowledge about adapting the home to walking with WA; Assess knowledge about walking with WA; Teach about adapting the home to walking with the WA: remove rugs/treadmills that don't adhere to the floor; arrange furniture to provide space for walking with the WA; remove loose objects and cables from the floor. Teach about walking with MS: teach about suitable and easy-to-wear footwear; teaching about the correct adjustment of the MS and safety conditions - the support of the hands on the tripod should be at the level of the greater trochanter; teach about placing the tripod on the side of the healthy lower limb.	Demonstrated

	Potential to improve walking ability with WA	Improve the ability to walk with WA.	Assess ability to walk with WA. Instruct on walking with WA: On flat ground: 3-point gait: move forward with the tripod, move forward with the operated limb and move forward with the healthy limb; Climbing stairs: 1 - up with the healthy limb, 2 - up with the healthy limb and 3 - up with the AM; Going down stairs: down with the AM, down with the operated limb and down with the healthy limb; Training to walk with the AM: indoors and outdoors with progression of the distance covered and going up and down stairs. Promote rest periods during training.	Holden Functional Gait Classification: Category 3: Dependent gait with supervision.

After five sessions of RN, there were health gains with improvements in muscle strength, body balance and gait, as well as in the Barthel index and Lawton index. The pain assessment showed a decrease from 4/10 to 2/10. Oxygen saturation improved from 94 % to 99 %, with an improvement in tiredness. Muscle strength improved in all limbs. In terms of balance, dynamic balance in a sitting position, which was initially reduced, was present in the final assessment. The remaining parameters remained reduced, with the exception of static sitting balance, which remained the same in both assessments. As for gait, there was an evolution from category 2 (dependent gait - level I) to category 3 (dependent gait with supervision). The Barthel Index showed a significant improvement, from 40/100 to 70/100. The Lawton Index decreased slightly, from 22/30 to 18/30. In terms of the home, gains were made with the removal of carpets and loose cables, making it more functional and safe with free spaces for movement.

DISCUSSION

The results found corroborate the existing literature, highlighting the benefits of an FMR program in a home setting.[9,10] The functionality of people with upper extremity femoral fractures who have undergone surgery is compromised due to the presence of pain and functional limitation of the affected limb. This condition translates into deficits in self-care, muscle strength and an increased risk of complications associated with immobility. The implementation of an RN program is essential for the recovery of functionality, promoting health gains evidenced by improvements in muscle strength, body balance, gait, ability to perform ADLs and knowledge of safety measures.[9]

In a rehabilitation program aimed at people who have undergone partial hip replacement, gains were also seen in terms of muscle movement, with an increase in upper and lower limb strength, improved joint range of motion and an increase in the quality and distance covered with a WA. These results reinforce the role of the RNS in the orthotrauma field, through the implementation of individualized programs aimed at optimizing functionality, promoting independence and improving the person's quality of life.[10] Lurie et al.[11] revealed that the implementation of muscle strength training, balance training, postural correction and gait training promoted an improvement in balance as well as a reduction in complications. Through the implementation of an individualized care plan, muscle and joint exercise training, balance training and gait training proved to be fundamental in improving Ms. M's functional capacity. Palma et al.[9] found that the functionality of people with upper extremity femur fractures who had undergone surgery was compromised by the presence of pain and the functional limitation of the fractured limb. This resulted in a deficit in self-care, muscle strength and the risk of complications resulting from immobility. They concluded that the implementation of a rehabilitation program was crucial to regaining autonomy and functionality, achieving health gains with significant improvements in balance, muscle strength, gait, ability to perform ADLs and knowledge of safety measures.

In this way, the results obtained in this clinical case report show what has been found in the available scientific literature. It should be noted that the implementation of the care plan was not only aimed at Mrs. M.'s progressive physical recovery, but also at her emotional and social well-being, since in the last sessions she was in a better mood and was not emotionally lax. This result was achieved by establishing a relationship of empathy and trust throughout the rehabilitation program.

CONCLUSIONS

This clinical case report highlights the importance of rehabilitation for people who have undergone hip hemiarthroplasty, by showing the gains of an FMR rehabilitation program, in a home setting, with increased strength, improved balance and gait.

This study underlines the importance of a holistic and multidisciplinary approach in an RN program. In addition, it highlights the need for adaptation and innovation in home care practices, which represent a challenge due to the variability and unpredictability of the conditions encountered, requiring flexibility and adaptability on the part of the health professional.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Luciana Toscano, Antónia Garanhel, Sandy Severino.
Drafting - original draft: Luciana Toscano, Sandy Severino.

Writing - proofreading and editing: Luciana Toscano, Antónia Garanhel, Nelson Guerra, Luís Sousa, Sandy Severino.

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