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OVERVIEW OF PENDING BPJS KESEHATAN CLAIMS FOR INPATIENT SERVICES

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ABSTRACT

Proximal femoral fractures are a major cause of morbidity and functional decline, with an incidence of approximately 200 per 100,000 individuals per year and mortality rates of up to 30% in elderly patients. Surgical intervention is mandatory for treatment, preferably within 24 hours according to the Federal Joint Committee (GBA). The gamma nail is recommended for unstable intertrochanteric fractures, but systematic postoperative rehabilitation is poorly documented, although it has an important impact on functional outcomes. We report the case of a patient treated with gamma nail fixation for a right proximal femoral fracture and intensive multidisciplinary rehabilitation, who was admitted approximately 18 days postoperatively with significant limitations in range of motion, muscle strength, balance, and ambulation — specifically, a Berg Balance Scale score of 6, a Functional Status Test score of 45, Visual Analog Scale pain scores of 8/10, and inability to ambulate independently. A comprehensive individualized rehabilitation protocol was implemented over a nine-week period, consisting of active and active-assistive range of motion exercises, progressive resistance training, static and dynamic balance activities, and progressive gait training with weight-bearing as tolerated. Sequential objective assessments were completed at baseline, week 2, week 4, week 6, and week 9. Repeated assessments showed significant and incremental gains in all domains: Berg Balance Scale score increased from 6 to 50, Functional Status Test score increased from 45 to 90, Visual Analog Scale pain ratings decreased from 8 to 0-2, and independent ambulation with a walking frame for 30 meters was achieved, with progressive recovery of range of motion and manual muscle testing grades. This case demonstrates the importance of early, intensive, multidisciplinary rehabilitation following gamma nail fixation and reveals that major functional improvement may be accomplished within nine weeks when rehabilitation is guided by sequential objective assessments, personalized progressive weight-bearing protocols, and comprehensive treatment that simultaneously targets balance, strength, range of motion, gait, and functional independence.

Keywords: case report; gamma nail fixation; hip fracture; physiotherapy; rehabilitation

INTRODUCTION

Proximal femoral fracture is a significant public health problem, and its increasing incidence is matched by the aging of the population (Kannus et al., 1996). These fractures are associated with significant morbidity, mortality, and loss of functional independence (Braithwaite et al., 2003). Surgical stabilization remains the cornerstone of management, with intramedullary nailing devices such as the gamma nail demonstrating favorable biomechanical properties in unstable trochanteric fractures (Baumgaertner et al., 1995; Parker & Handoll, 2010).

The gamma nail provides rotational stability and load-sharing characteristics that facilitate early mobilization (Utrilla et al., 2005). However, postoperative functional outcome is profoundly influenced by rehabilitation quality and intensity (Li et al., 2022). Structured physiotherapy improves muscle strength, range of motion, balance, and gait following hip fracture surgery (Sherrington & Lord, 1997; Binder et al., 2004). Detailed case reports documenting functional recovery trajectories with serial objective measurements remain limited. We present a case of intensive rehabilitation following gamma nail fixation, demonstrating substantial functional recovery over nine weeks.

METHOD

This study is a descriptive clinical case report documenting the diagnostic evaluation, rehabilitation protocol, and functional outcomes of a patient treated with gamma nail fixation for a right proximal femoral fracture. The patient, who had no other medical problems and was functionally independent in activities of daily living and mobility before the fracture, was referred for intensive inpatient therapy with weight-bearing as tolerated on the right lower extremity and was admitted to the rehabilitation unit approximately 18 days after surgery. A systematic, individualized, and progressive rehabilitation protocol was initiated promptly and continued for nine weeks.

Functional status was assessed using standardized clinical outcome measures, including the Berg Balance Scale, the Functional Status Test, the Visual Analog Scale for pain, goniometric range-of-motion measurement, manual muscle testing according to the Medical Research Council scale, and gait distance assessment. Sequential objective assessments were performed at baseline, week 2, week 4, week 6, and week 9 to monitor progression across all domains. Written informed consent was obtained from the patient for publication of this case report and accompanying data. All clinical interventions complied with the ethical standards of the responsible institutional committee and the Declaration of Helsinki (1975, revised in 2013).

RESULT AND DISCUSSION

Case Presentation

A patient underwent postoperative rehabilitation after gamma nail fixation of the right proximal femur. The patient had no other medical problems and was functionally independent in activities of daily living and mobility before the fracture, and was referred for intensive inpatient therapy with weight-bearing as tolerated on the right lower extremity.

Clinical Findings

On initial examination, the patient had limited active right hip range of motion (ROM), with pain on movement in all directions. Manual muscle testing revealed 2/5 strength for the right hip flexors, extensors, adductors, abductors, and rotators. Right knee flexors were 4/5 and extensors were 3/5. The left lower limb had normal mobility and strength. The patient was non-ambulatory and required assistance with bed repositioning and transfers. The Berg Balance Scale score was 6, the Functional Status Test score was 45, and gait distance was nil. Visual Analog Scale scores for right hip discomfort were 8/10 for both flexion and extension, and 7/10 for abduction.

Timeline

The patient was admitted to rehabilitation approximately 18 days after surgery. A systematic rehabilitation protocol was initiated promptly and continued for nine weeks, with evaluations at baseline, week 2, week 4, week 6, and week 9.

Diagnostic Assessment

The diagnosis was established from the surgical history and postoperative radiographs. The assessment included musculoskeletal performance, neuromuscular condition, pain levels, balance, walking ability, and functional autonomy, evaluated using the Berg Balance Scale, the Functional Status Test, the Visual Analog Scale, goniometric range of motion, manual muscle testing, and gait distance assessment.

Therapeutic Intervention

The rehabilitation protocol was individualized and progressive, and included: (1) active and active-assistive range of motion exercises of the right hip and knee; (2) progressive resistance training consisting of isometric, concentric, and eccentric strengthening exercises for the hip abductors, hip extensors, and knee extensors; (3) progressive gait training with a walking frame and weight-bearing as tolerated; (4) static and dynamic balance exercises; and (5) functional training for bed mobility, transfers, and activities of daily living. After discharge, the patient received intensive inpatient rehabilitation, followed by outpatient physiotherapy.

Follow-up and Outcomes

Sequential assessments revealed incremental progress across all domains (Table 1). The Berg Balance Scale score improved from 6 to 50, and the Functional Status Test score increased from 45 to 90. By the ninth week, Visual Analog Scale pain ratings for right hip flexion and extension decreased from 8/10 to 0/10, and pain on abduction decreased from 7/10 to 2/10. Gait distance improved from an inability to walk to 30 meters with a walking aid. Range of motion measurements showed progressive recovery (Table 2). Right hip flexion active range of motion improved from painful and restricted to 120°, with passive range achieving 135°. Hip extension improved to 25° active and 35° passive. Hip abduction progressed to 20° active and 30° passive. Knee flexion and extension both achieved full range of motion by week 9. Manual muscle testing demonstrated progressive strengthening (Table 3). Right hip flexor strength improved from grade 2/5 to grade 4+/5, hip extensors from 2/5 to 4+/5, hip adductors from 2/5 to 4+/5, hip abductors from 2/5 to 4/5, hip internal rotators from 2/5 to 4/5, and hip external rotators from 2/5 to 4/5. Knee flexors improved from 4/5 to 5/5 and knee extensors from 3/5 to 5/5. At week 9, the patient was independent in bed mobility and transfers, ambulating with a walking frame for indoor mobility.

Table 1.
Serial outcome measures during the nine-week rehabilitation program

Time point	Berg Balance Scale	Functional Status Test	VAS pain — hip (flexion/extension/abduction)	Gait distance (m)
Pre-rehabilitation	6	45	8 / 8 / 7	Unable
Week 2	13	50	6 / 5 / 7	1
Week 4	29	65	5 / 4 / 6	5
Week 6	43	75	3 / 3 / 5	15
Week 9	50	90	0 / 0 / 2	30

Note: VAS = Visual Analog Scale. Higher scores on the Berg Balance Scale and Functional Status Test indicate better function. Lower VAS scores indicate less pain.

Table 2.
Serial joint range of motion measurements (degrees) during the nine-week rehabilitation program

Joint motion	Pre-rehabilitation	Week 2	Week 4	Week 6	Week 9
Hip flexion	Painful / 15°	20° / 30°	50° / 60°	90° / 120°	120° / 135°
Hip extension	Painful / 10°	10° / 30°	20° / 30°	20° / 25°	25° / 35°
Hip abduction	Painful / Painful	5° / 5°	10° / 15°	10° / 15°	20° / 30°
Hip internal rotation	Restricted / Restricted	5° / 5°	5° / 10°	15° / 20°	25° / 25°
Hip external rotation	Restricted / Restricted	5° / 5°	10° / 10°	25° / 30°	30° / 40°
Knee flexion	Restricted / Restricted	10° / 10°	40° / 45°	Full / Full	Full / Full
Knee extension	Restricted / Restricted	10° / 10°	40° / 45°	Full / Full	Full / Full

Note: Values shown as active range of motion / passive range of motion (AROM/PROM) for each time point.

Table 3.
Serial manual muscle testing grades during the nine-week rehabilitation program

Muscle group	Pre-rehab (R/L)	Week 2 (R/L)	Week 4 (R/L)	Week 6 (R/L)	Week 9 (R/L)
Hip flexor	2 / 3	2 / 5	3 / 5	4 / 5	4+ / 5
Hip extensor	2 / 4	2 / 5	3 / 5	4 / 5	4+ / 5
Hip adductor	2 / 4	2 / 5	4 / 5	4 / 5	4+ / 5
Hip abductor	2 / 4	2 / 5	2 / 5	3 / 5	4 / 5
Hip internal rotator	2 / 5	2 / 5	3 / 5	3 / 5	4 / 5
Hip external rotator	2 / 5	2 / 5	3 / 5	3 / 5	4 / 5
Knee flexor	4 / 4	4 / 5	4 / 5	4 / 5	5 / 5
Knee extensor	3 / 4	3 / 5	4 / 5	4 / 5	5 / 5

Note: Muscle strength graded according to the standard Medical Research Council scale (0-5). Grade 4+ indicates strength between grades 4 and 5. R = right; L = left.

This case documents functional recovery following gamma nail fixation for a right proximal femoral fracture. The substantial improvements in balance, functional status, pain, range of motion, muscle strength, and ambulatory capacity over nine weeks highlight the critical role of structured rehabilitation in optimizing postoperative outcomes. The gamma nail offers biomechanical advantages, including intramedullary load sharing and rotational stability, that facilitate early mobilization (Utrilla et al., 2005). Clinical studies demonstrate that proximal femoral nail systems are associated with shorter surgical times, reduced blood loss, and earlier weight-bearing compared with dynamic hip screw fixation (Parker et al., 2012; Simmermacher et al., 2008). However, surgical success alone does not guarantee functional recovery; rehabilitation quality plays a determinative role.

The rehabilitation approach employed was comprehensive and progressive, addressing the different impairments that follow hip fracture surgery. Early mobilization and progressive weight-bearing reduce complications and improve functional results. Pain alleviation promoted greater participation in active rehabilitation (Oldmeadow et al., 2006). The progressive improvement in range of motion and muscular strength is consistent with the neuromuscular adaptations expected after systematic resistance training. The increase in gait distance to 30 meters reflects the cumulative benefits of strength, flexibility, balance, and pain management (Berg et al., 1992).

The Functional Status Test improvement from 45 to 90 reflects substantial functional capacity gains. Pain reduction facilitated increased engagement in active rehabilitation. The progressive recovery of range of motion and muscle strength is consistent with neuromuscular adaptations expected following structured resistance training (Mangione et al., 2010). Restoration of knee strength to grade 5/5 is particularly important for safe ambulation. The gait distance progression to 30 meters demonstrates the cumulative effect of improvements in strength, range of motion, balance, and pain control.

Strengths of this report include the use of multiple standardized outcome measures assessed serially over nine weeks. Limitations include the single-case design, which precludes generalization, and the absence of long-term follow-up. The patient's lack of comorbidities and pre-morbid functional independence may have contributed to the favorable outcomes, which may differ in patients with multiple comorbidities.

This case shows that intensive early rehabilitation following gamma nail fixation is feasible and can result in marked functional gains. Goals were continually monitored to guide individualized program development. A more comprehensive strategy is needed to address the complex needs of patients with hip fractures. The main findings are as follows: (1) organized, intensive rehabilitation can result in substantial functional improvement within nine weeks; (2) individualized progressive weight-bearing

protocols are important; and (3) a holistic rehabilitation approach focusing on balance, strength, range of motion, gait, and functional independence is important for achieving the best outcomes.

Clinical Implications

Early initiation of intensive rehabilitation following gamma nail fixation is associated with significant functional improvements within nine weeks. Progressive weight-bearing protocols should be individualized based on patient tolerance and serial objective assessments. Comprehensive rehabilitation addressing balance, strength, range of motion, and gait is essential for optimal recovery. Standardized outcome measures should be employed serially to guide rehabilitation progression. Multidisciplinary rehabilitation teams should coordinate care to address the complex needs of post-hip-fracture patients.

CONCLUSION

Intensive, organized rehabilitation after gamma nail fixation of proximal femoral fractures was associated with significant improvement in balance, functional ability, pain, range of motion, muscle strength, and walking ability after nine weeks. These positive results support the implementation of large-scale multidisciplinary rehabilitation programs with subsequent objective evaluation. Further research is required to establish optimal rehabilitation strategies and patient-specific factors predicting rehabilitation outcomes.

REFERENCES

Kannus P, Parkkari J, Sievanen H, Heinonen A, Vuori I, Järvinen M. Epidemiology of hip fractures. Bone. 1996;18:57S-63S.

Braithwaite RS, Col NF, Wong JB. Estimating hip fracture morbidity, mortality and costs. J Am Geriatr Soc. 2003;51(3):364-370.

Baumgaertner MR, Curtin SL, Lindskog DM, Keggi JM. The value of the tip-apex distance in predicting failure of fixation of peritrochanteric fractures of the hip. J Bone Joint Surg. 1995;77(7):1058-1064.

Parker MJ, Handoll HH. Gamma and other cephalocondylic intramedullary nails versus extramedullary implants for extracapsular hip fractures in adults. Cochrane Database Syst Rev. 2010;(9):CD000093.

Utrilla AL, Reig JS, Muñoz FM, Tufanisco CB. Trochanteric gamma nail and compression hip screw for trochanteric fractures: a randomized, prospective, comparative study in 210 elderly patients with a new design of the gamma nail. J Orthop Trauma. 2005;19(4):229-233.

Li K, Li Z, Hu N, et al. Effect of proximal femoral nail antirotation on clinical outcome, inflammatory factors and myocardial injury markers in patients with femoral trochanteric fracture. J Healthc Eng. 2022;14:4795-4803.

Sherrington C, Lord SR. Home exercise to improve strength and walking velocity after hip fracture: a randomized controlled trial. Arch Phys Med Rehabil. 1997;78(2):208-212.

Binder EF, Brown M, Sinacore DR, et al. Effects of extended outpatient rehabilitation after hip fracture: a randomized controlled trial. JAMA. 2004;292(7):837-846.

Parker MJ, Bowers TR, Pryor GA. Sliding hip screw versus the Targon PF nail for trochanteric fractures: a randomised trial of 400 patients. J Bone Joint Surg Br. 2012;94(3):391-397.

Simmermacher RK, Ljungqvist J, Bail H, et al. The new proximal femoral nail antirotation (PFNA) in daily practice: results of a multicenter clinical study. Injury. 2008;39(8):932-939.

Oldmeadow LB, Edwards ER, Kimmel LA, et al. No rest for the wounded: early ambulation after hip surgery accelerates recovery. ANZ J Surg. 2006;76(7):607-611.

Berg KO, Wood-Dauphinee SL, Williams JI, Maki B. Measuring balance in the elderly: validation of an instrument. Can J Public Health. 1992;83(Suppl 2):S7-S11.

Mangione KK, Craik RL, Palombaro KM, et al. Home-based leg-strengthening exercise improves function 1 year after hip fracture: a randomized controlled study. J Geriatr Phys Ther. 2010;33(2):78-89.

Handoll HH, Sherrington C. Mobilisation strategies after hip fracture surgery in adults. Cochrane Database Syst Rev. 2007;(1):CD001704.

Kramer JF, Barry J, Vandenbergh M. The effect of knee immobilization on gait and balance following hip fracture. Physiother Can. 1994;46(1):33-38.