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Case Report

Nursing Care for Multisystem Complication Risk Prevention and Control After Hemiarthroplasty in an Elderly Patient with Femoral Neck Fracture: A Case Report

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Abstract

This case report summarizes the nursing care used to prevent and control multisystem complication risks after hemiarthroplasty in a 75-year-old patient with a Garden type IV femoral neck fracture. Perioperative assessments included pain, fall, thrombosis, pressure injury, anxiety, and activities of daily living. Individualized interventions addressed pain control, infection prevention, thromboprophylaxis, pressure injury and fall prevention, nutritional support, psychological care, staged rehabilitation, and discharge follow-up. No pulmonary infection, urinary tract infection, deep vein thrombosis, pressure injury, fall, or prosthetic dislocation occurred during hospitalization. The postoperative pain score decreased from 3 to 0–1, the Self-Rating Anxiety Scale score decreased from 62 to 40, and the patient walked 50–100 meters with a walker under protected weight-bearing conditions on postoperative day 14. At 3 months, the Barthel Index was 85 and no long-term complication was observed. This case suggests that dynamic multisystem risk assessment combined with staged nursing interventions may support perioperative safety and functional recovery in older adults after hemiarthroplasty; its effectiveness requires validation in larger case series or controlled studies.

Keywords: Aged; Femoral Neck Fracture; Hemiarthroplasty; Complication Risk; Perioperative Nursing; Case Report

1. Background

Femoral neck fracture is a common and serious injury in older adults. Advanced age, frailty, anemia, thrombocytopenia, malnutrition, pain, and reduced mobility increase the risk of respiratory infection, urinary tract infection, venous thromboembolism, pressure injury, falls, and prosthetic dislocation after surgery [1–3]. Hemiarthroplasty can restore hip stability and facilitate early mobilization, but safe recovery depends on coordinated assessment and staged nursing intervention.

This case report describes the perioperative nursing care of an older woman with a displaced femoral neck fracture and several risk factors for multisystem complications. The report focuses on dynamic risk assessment, individualized intervention, rehabilitation progression, and follow-up. The case report was organized with reference to the CARE reporting guideline [4].

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2. Case Presentation

2.1. Patient Information and Clinical Course

A 75-year-old woman was admitted on July 18, 2025, after falling on level ground and developing left hip pain and restricted movement. Computed tomography showed a left femoral neck fracture, Garden type IV. Her height was 155 cm, weight 52 kg, and body mass index 21.6 kg/m^2. Her medical history included hypertension, hyperlipidemia, and megaloblastic anemia. Previous operations included retinal detachment repair, nasal polypectomy, and lumbar disc surgery. She had no known drug allergies. Before admission, she lived at home with her spouse and was able to perform basic daily activities with mild dependence; her preoperative Barthel Index was 65.

On July 23, 2025, she underwent left hemiarthroplasty under general anesthesia. The American Society of Anesthesiologists physical status was II. She remained in the orthopedic ward for 17 days and was discharged after stable wound healing, improved mobility, and completion of discharge education.

2.2. Clinical Assessment and Treatment

The admission assessment identified severe anemia, thrombocytopenia, borderline hypoalbuminemia, pain, anxiety, and limited mobility. Preoperative laboratory results included hemoglobin 71 g/L, platelet count 82×10^9/L, and albumin 38.50 g/L (Table 1). The resting pain score was 5 and the activity pain score was 7. The Morse Fall Scale score was 80, indicating high fall risk. The initial Caprini score was 4 and increased to 7 after surgical risk factors were considered. The Braden Scale score was 16, indicating pressure injury risk. The Self-Rating Anxiety Scale score was 62. These findings were used to establish a nursing plan addressing pain, infection, thrombosis, bleeding, pressure injury, falls, malnutrition, anxiety, and dislocation risk.

Written informed consent for participation and follow-up was obtained from the patient and her family. The case was approved by the Medical and Laboratory Animal Ethics Committee of Wuhan Donghu University (Ethics Approval No. DHLL202600010). All case information was de-identified.

3. Nursing Assessment and Problem Identification

The nursing team used repeated assessments rather than a single admission score. Pain, respiratory status, urinary function, wound condition, limb circulation, laboratory indicators, nutritional intake, psychological state, mobility, and caregiver support were reviewed throughout hospitalization. The main nursing problems were acute postoperative pain; risks of pulmonary and urinary infection; high risk of thrombosis with concurrent thrombocytopenia; pressure injury and fall risk during bed rest; inadequate nutrition; anxiety related to loss of independence; and insufficient knowledge of postoperative precautions.

4. Nursing Interventions

4.1. Pain, Respiratory, Urinary, and Wound Care

Pain was assessed regularly at rest and during activity. Patient-controlled analgesia was used during the acute phase, followed by prescribed lysine acetylsalicylate or diclofenac sodium as needed. The affected limb was maintained in an abduction-neutral position, and the patient received a quiet environment, cold compresses during the early postoperative period, and relaxation support. The pain record is summarized in Table 3.

Respiratory care included head-of-bed elevation, deep breathing, effective coughing, assisted turning, back tapping, oral care, and prescribed nebulization. Respiratory rate and oxygen saturation were monitored. A closed urinary drainage system and strict hand hygiene were maintained while the catheter was in place. Bladder training began on postoperative days 2–3, and the catheter was removed on postoperative day 7 after stable urine output. The wound was observed for redness, swelling, exudate, and bleeding. The patient was turned at least every 2 hours, with protection of bony prominences and avoidance of hip adduction or internal rotation.

4.2. Thrombosis, Bleeding, Pressure Injury, and Fall Prevention

Because the Caprini score reached 7, thromboprophylaxis combined limb observation, positioning, ankle-pump exercises, quadriceps isometric contractions, early mobilization, and prescribed low-molecular-weight heparin. The team monitored limb swelling, pain, skin temperature, color, dorsalis pedis pulse, wound bleeding, bruising, urine, stool, hemoglobin, platelet count, and coagulation indicators. The concurrent thrombocytopenia required continuous assessment of the balance between thrombosis prevention and bleeding risk (Table 2 and Table 8).

Fall and dislocation prevention included a call bell within reach, bed safety measures, assisted transfers, non-slip footwear, caregiver instruction, and avoidance of hip flexion beyond 90 degrees, adduction across the midline, and internal rotation. Pressure injury prevention consisted of scheduled repositioning, skin inspection, moisture management, nutritional support, and gradual mobilization.

4.3. Nutrition, Psychological Care, and Rehabilitation

Nutritional screening identified anemia and low albumin. The patient received a high-protein diet, folic acid, vitamin B_{12}, adequate calories, and monitoring of food tolerance, hemoglobin, and albumin (Table 6). The patient and family were given repeated explanations, demonstrations, illustrated instructions, and opportunities to ask questions. Nursing staff acknowledged her fear of losing independence, provided reassurance, and involved her spouse and children in care and rehabilitation decisions.

Rehabilitation progressed from bed-based ankle pumps, quadriceps and gluteal contractions, and safe positioning to sitting, assisted standing, walker training, and protected walking. The staged plan is shown in Table 4. Progression depended on pain, vital signs, wound status, strength,

balance, and tolerance. Range-of-motion changes were recorded in Table 5. Before discharge, the family received instructions on medication, wound observation, nutrition, fall prevention, dislocation precautions, home exercises, and warning signs requiring medical review.

The nursing plan was reviewed during daily multidisciplinary rounds. Nurses communicated changes in pain, mobility, laboratory indicators, wound status, and caregiver readiness to the orthopedic and rehabilitation teams. When the patient tolerated a new activity without increased pain, dizziness, wound drainage, or oxygen desaturation, the activity was continued and gradually extended. When tolerance decreased, the plan was adjusted to shorter sessions with additional rest. This feedback process linked bedside observations with medical decisions and allowed the family to participate safely in each stage of recovery.

5. Outcomes and Follow-up

No pulmonary infection, urinary tract infection, deep vein thrombosis, pressure injury, fall, major bleeding event, or prosthetic dislocation occurred during hospitalization. The postoperative pain score decreased from 3 at 6 hours to 0–1 by postoperative day 7. The Self-Rating Anxiety Scale score decreased from 62 to 40. On postoperative day 14, the patient could stand for more than 30 minutes and walk 50–100 meters with a walker under protected weight-bearing conditions. The postoperative laboratory trend and core indicators are summarized in Tables 2 and 8; the pain and walking trends are shown in Figures 2 and 3.

Telephone and outpatient follow-up were completed at 1 and 3 months. At 1 month, the patient could perform dressing and washing independently and walk more than 200 meters with a walker; her Barthel Index was 70. At 3 months, gait was stable, most daily activities were performed independently, the prosthesis remained in a good position, and the Barthel Index was 85. No readmission, fall, dislocation, infection, or other long-term complication was reported (Table 9).

6. Discussion

This case illustrates the nursing value of linking repeated risk assessment with staged intervention in an older patient after hemiarthroplasty. The patient entered surgery with anemia, thrombocytopenia, nutritional risk, pain, anxiety, and limited mobility. A single intervention could not address these risks. Instead, the nursing plan connected pain relief with early activity, respiratory and urinary care with infection surveillance, anticoagulation with bleeding observation, and nutritional and psychological support with rehabilitation participation.

The most important practical point was reassessment. The Morse, Caprini, Braden, pain, anxiety, and Barthel scores provided a common language for communicating risk and monitoring change. The Caprini score increased after surgery, so thromboprophylaxis and bleeding surveillance were intensified. Similarly, rehabilitation was advanced only when pain, vital signs, wound condition, strength, and balance were acceptable. This approach is consistent with evidence supporting early mobilization, multidisciplinary rehabilitation, and nutritional support after hip fracture surgery [5–7].

The case also demonstrates the importance of caregiver participation. The spouse and children helped reinforce positioning precautions, medication instructions, nutrition, and home exercises. At 3 months, the patient had improved independence without a documented major complication. However, the outcome cannot be attributed to nursing intervention alone because successful surgery, baseline health, family support, and medical treatment also contributed.

This report has limitations. It describes one patient without a control group, so it cannot establish causal effectiveness or generalizability. Some assessments were based on routine clinical records rather than a complete standardized dataset, and a hip-specific functional scale such as the Harris Hip Score was not used. Future case series should include standardized functional outcomes, fall and readmission data, home-training adherence, and longer follow-up.

7. Conclusion

For older adults undergoing hemiarthroplasty after femoral neck fracture, coordinated nursing assessment and staged intervention may help reduce perioperative risk and support pain relief, mobilization, and recovery of daily function. This single case provides practical nursing reference, but larger case series and controlled studies are needed to evaluate the reproducibility of the approach.

Author Contributions

Shujun Gao and Feifei Chen jointly contributed to the conceptualization, clinical case analysis, nursing intervention interpretation, literature review, and manuscript preparation. Both authors reviewed and approved the final manuscript.

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Data Availability

The de-identified case data are not publicly available because of patient privacy and ethical restrictions, but may be made available by the corresponding author upon reasonable request and subject to appropriate approval.

Ethics Statement

This case report was approved by the Medical and Laboratory Animal Ethics Committee of Wuhan Donghu University (Ethics Approval No. DHLL202600010) and complied with relevant ethical requirements. Written informed consent for participation and follow-up was obtained from

the patient and her family.

Conflict of Interest

The authors declare no conflict of interest.

Acknowledgments

The authors have no acknowledgments to declare.

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Figures and Tables

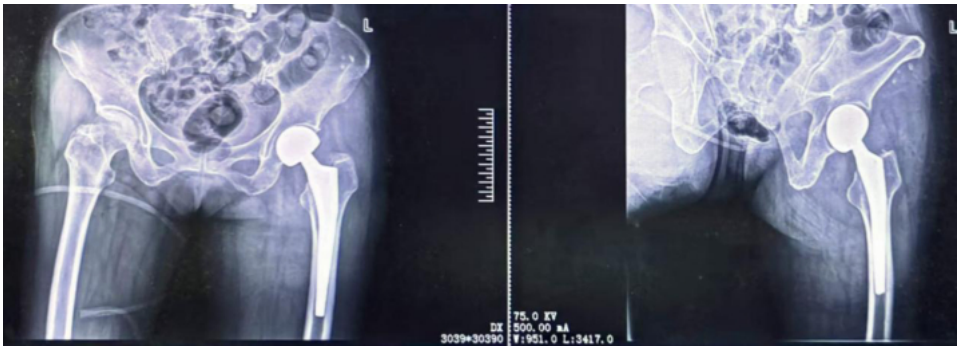


Figure 1. Postoperative Hip X-ray

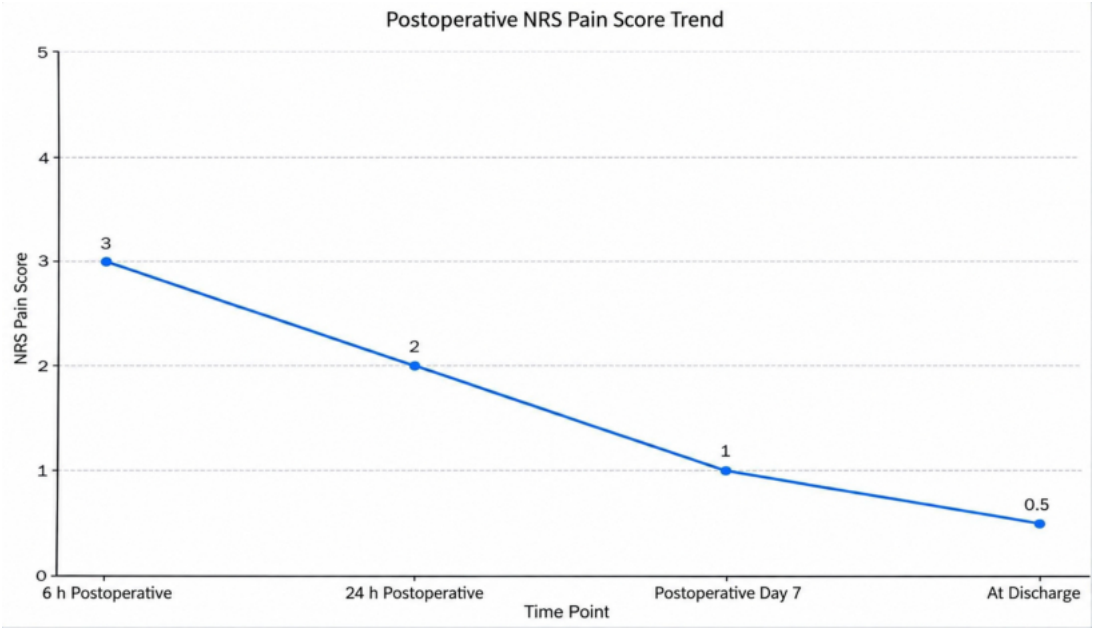


Figure 2. Pain Score Trend

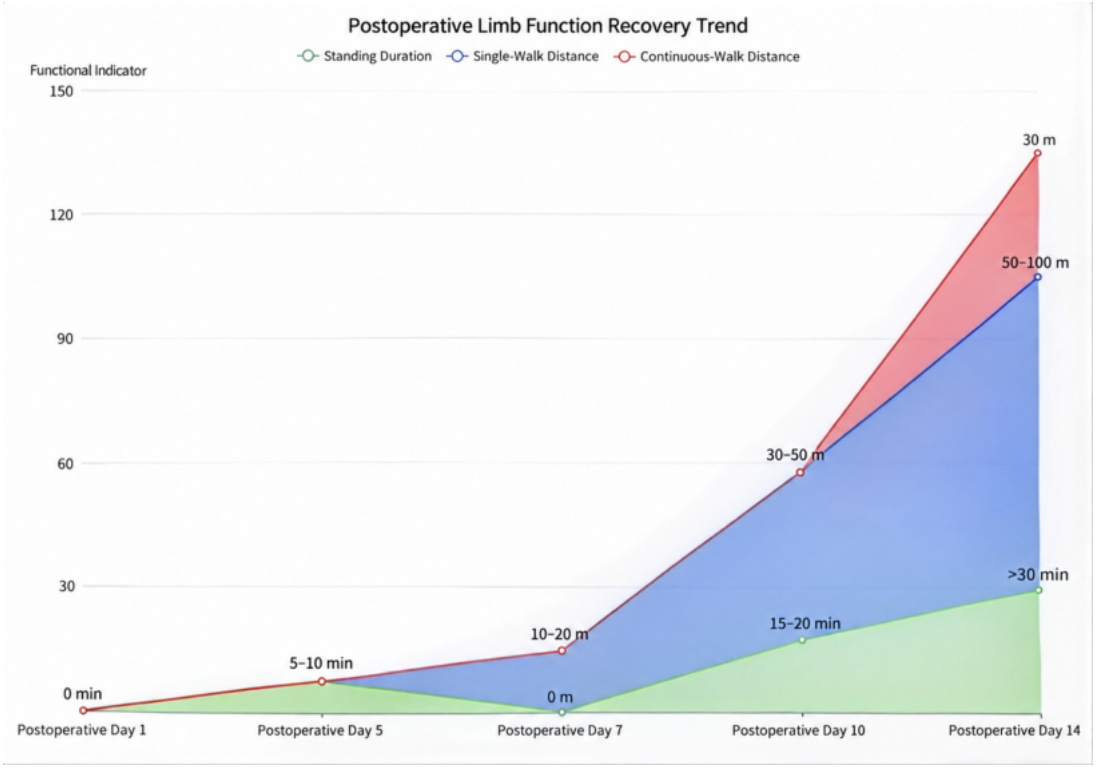


Figure 3. Functional Recovery Trend

Table 1. Preoperative Core Laboratory Test Results

Test Item	Result	Reference Range	Abnormality
Hemoglobin (g/L)	71	115–150	Decreased
Red Blood Cells ($\times 10^{12}$/L)	3.04	3.8–5.1	Decreased
Platelets ($\times 10^{9}$/L)	82	125–350	Decreased
Total Cholesterol (mmol/L)	3.28	2.8–5.2	Normal
Creatinine (μmol/L)	47	41–81	Normal
Albumin (g/L)	38.50	40–55	Mildly Decreased
Prothrombin Time (PT) (s)	11.50	9–13	Normal
Activated Partial Thromboplastin Time (APTT) (s)	28.90	25–31.3	Normal
International Normalized Ratio (INR)	0.99	0.76–1.24	Normal

Table 2. Comparison of Postoperative Dynamic Laboratory Tests

Test Item	Result	Reference Range	Trend
Hemoglobin (g/L)	95.00	115–150	Increased compared to preoperative
Platelets ($\times 10^{9}$/L)	79.00	125–350	Slightly decreased from preoperative
C-Reactive Protein (CRP) (mg/L)	10.00	0–10	Decreased, approaching reference range
Creatinine (μmol/L)	45.00	41–81	Normal
Albumin (g/L)	34.70	40–55	Slightly decreased from preoperative
D-dimer (mg/L)	2.07	0–0.55	Decreased from preoperative, still above range
Fibrinogen Degradation Products (mg/L)	9.22	0–5	Elevated

Table 3. Pain Assessment and Intervention Record

Assessment Time	NRS Score	Pain Location	Pain Quality	Intervention	Post-Intervention Score
6 hours post-op	3	Left hip	Distension	PCA pump (basal + bolus)	2
12 hours post-op	2	Left hip	Distension	Continue PCA, bed rest	1
24 hours post-op	2	Left hip	Distension	Diclofenac sodium suppository q12h	1
72 hours post-op	2	Left hip	Distension after activity	Lysine acetylsalicylate 0.9 g IV qd	1
7 days post-op	1	Left hip	Occasional distension	Stop PCA, analgesics as needed	0–1

Table 4. Staged Rehabilitation Training Plan

Rehabilitation Stage	Time	Training Exercises	Duration/Frequency	Tolerance Assessment (Level)	Anti-Dislocation Key Points
Bed-based Basic Training	Post-op Days 1–3	Ankle pumps, quadriceps isometrics, gluteal contractions, passive hip flexion/extension	10–15 min/session, 3–4 times/day	I–II	Abduction-neutral position, strictly avoid adduction/internal rotation
Active In-bed Training	Post-op Days 4–7	Active hip flexion/extension, sitting up at bedside	15–20 min/session, 4–5 times/day; sitting up 3 times/day, 5–10 min each	II–III, NRS $\leq$3	Legs apart, no crossing, hip flexion $< 90^\circ$
Ambulation Functional Training	Post-op Days 8–14	Walker-assisted standing, flat walking, hip abduction exercises	20–30 min/session, 3–4 times/day; walking 5–10 min	III	Keep affected limb abducted, avoid leaning/twisting and adduction

Table 5. Postoperative Hip Range of Motion Dynamic Record (Double-checked)

Monitoring Time	Flexion Angle	Adduction Angle	Abduction Angle	Measurement Method
Post-op Day 3	30°–45°	5°–10°	10°–15°	Supine, measured by 2 nurses using a goniometer, average of 3 repetitions
Post-op Day 7	60°–90°	15°–20°	15°–20°	Same as above
Post-op Day 14	90°–110°	15°–20°	20°–30°	Sitting, same as above

Table 6. Nutritional Support Plan

Nutrient	Dose/Intake	Frequency	Administration Method	Rationale
Folic Acid	5 mg/dose	qd	Oral	Correct megaloblastic anemia
Vitamin B_{12}	0.5 mg/dose	qd	Oral	Synergistic with folic acid for erythropoiesis
Protein	1.2–1.5 g/(kg·d)	Divided over meals	Enteral	Correct hypoalbuminemia, promote healing
Calories	25–30 kcal/(kg·d)	Divided over meals	Diet (staples + quality protein + fruits/vegetables)	Meet postoperative metabolic and rehabilitation needs

Table 7. CARE Timeline of the Case Report

Date/Period	Event	Key Findings	Nursing/Management
2025-07-18	Admission 7h post-fall	Left hip pain, restricted movement; CT: femoral neck fracture	Immobilization, analgesia, preoperative assessment
2025-07-18 – 07-22	Preoperative assessment & preparation	Anemia, thrombocytopenia, nutritional risk, fall/thrombosis risk	Risk assessment, health education, management of underlying diseases
2025-07-23	Surgery	Hemiarthroplasty under GA, blood loss ˜200 ml	Abduction-neutral position, cardiac monitoring, pain assessment
Post-op Days 1–3	Acute recovery phase	Pain, infection, thrombosis, bleeding, catheter-related risks	PCA analgesia, respiratory care, thromboprophylaxis, basic training
Post-op Days 4–7	Active in-bed training	Pain decreased, active training initiated	Active hip flexion/extension, sitting up, catheter removal assessment
Post-op Days 8–14	Ambulation training	Progressive return of walking ability	Walker-assisted standing/walking training, fall/dislocation prevention
Before Discharge	Discharge assessment	Assessment of pain, mobility, wound, complications	Home rehab plan, medication and follow-up instructions

Continued on next page

Table 7 continued from previous page

Date/Period	Event	Key Findings	Nursing/Management
1 Month Post-Discharge	Telephone/Outpatient follow-up	Activity level, BP/lipids, complications	Adjust rehab training and nutrition plan
3 Months Post-Discharge	Outpatient review	DR: good prosthesis position; Barthel 85	Continue rehab, assess independence

Table 8. Comparison of Core Indicators on Admission and at Discharge

Indicator Type	Test Item	Admission	24h Post-op	7d Post-op	At Discharge	Trend
Blood Routine	Hemoglobin (g/L)	71	68	82	95	Improved
	Platelets ($\times 10^9$/L)	82	79	88	90	Slightly increased
Liver/Kidney Function	Albumin (g/L)	38.50	34.70	37.00	36.00	Improved vs. acute phase
	Creatinine (μmol/L)	47	45	46	45	Normal
Coagulation Function	D-dimer (mg/L)	9.40	2.07	—	0.60	Decreased
Inflammatory Markers	CRP (mg/L)	37.82	—	—	10.00	Decreased, near normal
Vital Signs	Blood Pressure (mmHg)	130/90	135/90	128/86	125/85	Stable
	Heart Rate (beats/min)	75	77	72	70	Stable
	SpO_2 (%)	96	96	97	98	Stable

Table 9. Post-Discharge Follow-up Record

Follow-up Time	Hip Range of Motion	Functional Status	BP/Lipids	Complications	Barthel Index
1 Month Post-Discharge	Flexion 110°–120°, Adduction 20°–25°, Abduction 30°–35°	Independent dressing, washing, getting in/out of bed; walker-assisted walking $>$ 200 m	130–140/80–90 mmHg, Lipids normal	None	70
3 Months Post-Discharge	Flexion 120°–130°, Adduction 25°–30°, Abduction 35°–40°	Independent walking, stable gait, performs most daily activities	125–135/80–85 mmHg, Lipids normal	Prosthesis in good position, no loosening/infection	85