

# Comparative Case Study: Difference in Recovery between a Male vs Female Patient Post Total Hip Arthroplasty (THA)

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## Abstract

This case study discusses gender-specific differences in recovery trajectory post Total Hip Arthroplasty (THA) surgery. Two age matched patients had their surgery on the same day and were treated two times a week for three weeks by the same physical therapist (PT). Similar PT interventions were followed each session.

**Method:** Comparative case study.

**Results:** Both patients demonstrated good overall recovery. The female patient showed better quantitative improvement in hip ROM of abduction and external rotation. In contrast, the male patient showed significant improvement in functional outcomes like Timed Up and go (TUG) score and achieved independence with rollator walker earlier than the female.

**Conclusion:** These findings suggest that gender may influence post-THA rehabilitation outcomes, highlighting the need for individualized treatment plans.

**Keywords:** Total hip arthroplasty, gender, physical therapy, rehabilitation, home health.

## Background

Total hip arthroplasty is one of the most popular surgeries to treat hip osteoarthritis. Early physical therapy interventions post-surgery with home health have shown improvement in functionality, quality of life, and pain. A study done by Zhang et al shows a significant difference in recovery for patients who receive post-operative rehabilitation versus patients who don't <sup>1</sup>. A Delphi study performed by experts from USA and Canada also concluded the importance of early post operative rehabilitation

following THA and the need for development of clinical practical guidelines was highlighted <sup>2</sup>.

Potential differences in recovery between male and female patients have not been explored. A scoping review by Giuseppe highlights the need for more gender-related factors to be addressed for better post surgical outcomes, patient satisfaction and to prevent complications <sup>3</sup>.

The purpose of this study is to shed light onto the differences in outcomes between a male and a female patient receiving in-home therapy following THA surgery.

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### Case Presentations

Both the patients underwent left THA surgery on the same day, 01/27/2025.

#### Case 1: Female patient

Age: 82 y.o.

Height: 5'4 ft

Weight: 138 lbs

Presurgery diagnosis: severe left hip arthritis.

Goals post THA: To be independent in Activities of Daily Living (ADL), to be able to navigate stairs, to improve range of motion, to have less pain when walking, to be able to get in and out of the car.

#### Case 2: Male patient

Age: 82 y.o.

Height: 5'6 ft

Weight: 148 lbs

Pre-surgery diagnosis: severe left hip arthritis.

Goals post THA: To be independent in Activities of Daily Living (ADL), to improve Range of Motion (ROM), to have less pain when walking and getting up from the recliner, to be able to get in and out of the car independently.

### Assessments

- Both patients started Home Health Physical Therapy (HHPT) one day post-surgery by the same PT 2 times a week for 3 weeks.

- Outcome measures included:
  - Range of motion (ROM) using a goniometer
  - Pain based on VAS (Visual Analog Scale)
  - Gait (Amount of Assistance required)
  - Timed Up and Go test (TUG)
- A reassessment was done on the 4th session and a discharge was done on the 6th. Data was collected at baseline (1st) session, reassessment (4th) and discharge (6th) sessions.

### Differential Diagnosis

- Both patients have the same diagnosis of rehabilitation following left THA surgery.
- Restricted ROM, strength, and mobility following the surgery.

### Physical Therapy Interventions/Treatments

After the initial assessment, the patients and therapist worked on collective goals and the following objectives:

- Improving ROM
- Reducing pain
- Formulating an HEP
- Gait training.

Treatment was given based on Clinical practice guidelines for THA.

The outline of interventions is discussed in **TABLE 1.**

**Table 1. PT Interventions.**

Session 1	Physical Therapy evaluation(Assessing Gait, TUG, pain,ROM), Formulating a Plan of care (POC), Post surgical precautions discussed, Gentle in bed exercises initiated (Ankle pumps, quad sets, glute sets, Heel slides in supine), Home exercise program (HEP) devised.
Session 2	Gait training(with walker), Exercises: ankle pumps, glute sets, quadricep sets, heel slides ( hip knee flexion and hip abduction),Standing weight shifts.
Session 3	Gait training(with walker): Increased ambulatory distance, cues to improve gait pattern. Exercises: continue and progress from session 2 as tolerated, Standing weight shifts, heel raises.

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Session 4 (Reassessment)	Gait training (with walker) : Increase ambulatory distance, outdoor walking, car transfers.  Continue all exercises from session 3, add all exercises to HEP.  Test TUG, pain, ROM and gait.
Session 5	Gait training (with walker): stair climbing with cane.  Continue and progress all exercises from session 4, Standing mini squats, hip abduction, extension on left leg only.
Session 6 (Discharge)	All exercises reviewed. TUG,Pain and Gait assessed. Patient discharged to Outpatient PT to continue rehabilitation.

Postsurgical precautions and medications were discussed every session. Patients were advised to ice after performing HEPs and post-PT to reduce swelling and pain.

**Outcomes**

Patient-specific outcomes were collected at 3 points : baseline (initial assessment), reassessment (4th visit) and discharge visit (6th)

**1. Baseline: (1st visit)**

The patient-specific outcomes for both patients are outlined in **TABLE 2**.

**Table 2. Outcomes Baseline (Initial Assessment)**

Outcomes	Case 1: Female	Case 2: Male
Pain (VAS)	7/10	5/10
TUG	71 secs	52 secs
Gait (Assistance)	Minimal Assistance with Rollator walker	Minimal Assistance with Rollator walker
ROM (Hip flexion,abduction and External rotation(ER) )	70, 5, 15 degrees	75, 0, 10 degrees

As per the assessment, the male patient scored better on the VAS pain scale and TUG and the female patient started with slightly better hip ROM. Both patients required similar assistance for ambulation.

**2. Reassessment (4th visit)**

Both patients show significant improvement in all outcome measures during this period. Both patients have similar pain levels and the same hip flexion ROM. The female patient showed better improvement in hip abduction and ER ROM as compared to the male.

The male patient showed a better TUG score and Stand by Assistance when walking vs contact guard assistance for the female.

The outcomes are outlined in **TABLE 3**.

**Table 3. Outcomes Re-assessment (4th visit)**

Outcomes	Case 1: Female	Case 2: Male
Pain (VAS)	3/10	3/10
TUG	36 secs	31 secs
Gait (Assistance)	Contact guard assistance with Rollator walker	Stand by Assistance with Rollator walker
ROM (Hip flexion, abduction, ER)	90, 25, 25 degrees	90,15, 20 degrees

**3. Discharge (6th visit)**

Final outcomes during the discharge visit showed an overall improvement for both patients. The female patient showed better

improvement in all the hip range of motions as compared to the male. The male had a better TUG time but still had minimal pain of 1/10. The outcomes are outlined in **TABLE 4**.

**Table 4. Outcomes Discharge (6th visit)**

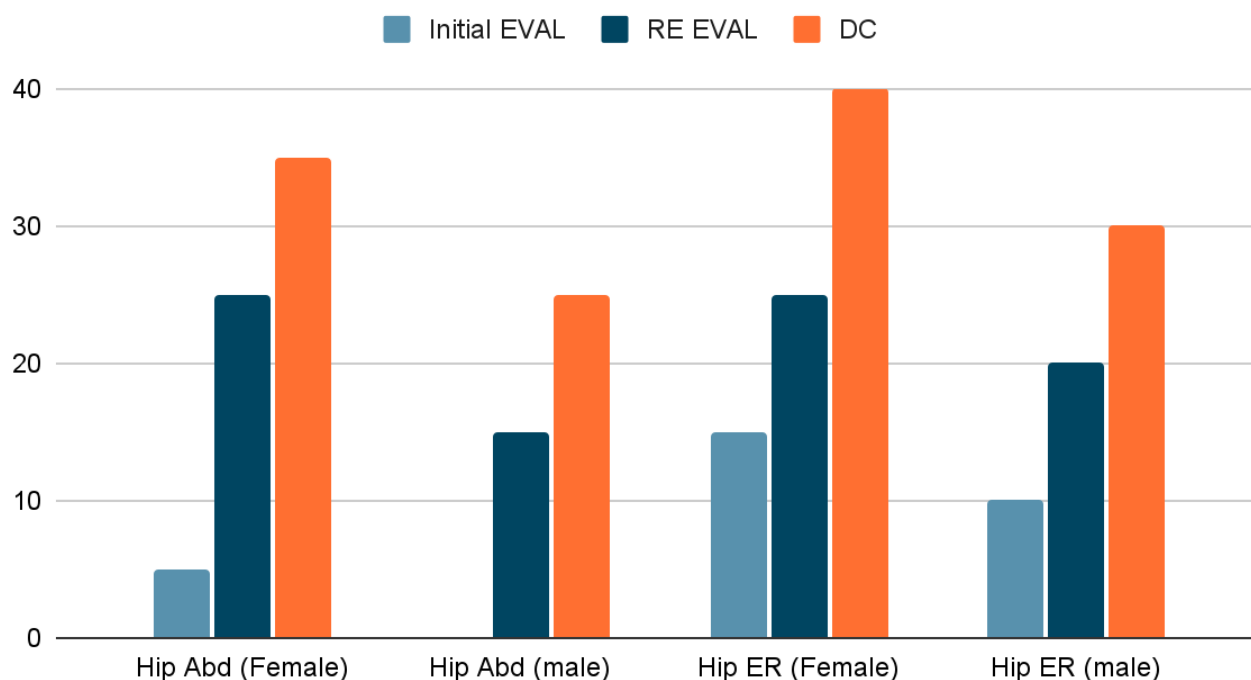
Outcomes	Case 1: Female	Case 2: Male
Pain (VAS)	0/10	1/10
TUG	15 secs	12 secs
Gait (Assistance)	Independent with RW	Independent with RW
ROM (Hip flexion, abduction, ER)	90,35,40 degrees	90,25,30 degrees

## Comparison

Patients one and two were treated by the same therapist for 6 visits and had very similar PT interventions.

**Patient 1:** the female patient had better improvement in overall hip ROM at all 3 data collection points: initial assessment, re-assessment, and discharge as compared to the male patient. Hip flexion ROM remained the same after the 4th visit for both patients showing similar improvement. The graphical description of hip ER and abduction ROM for both male and female at all 3 data points are depicted in **FIGURE 1**.

## Hip ROM

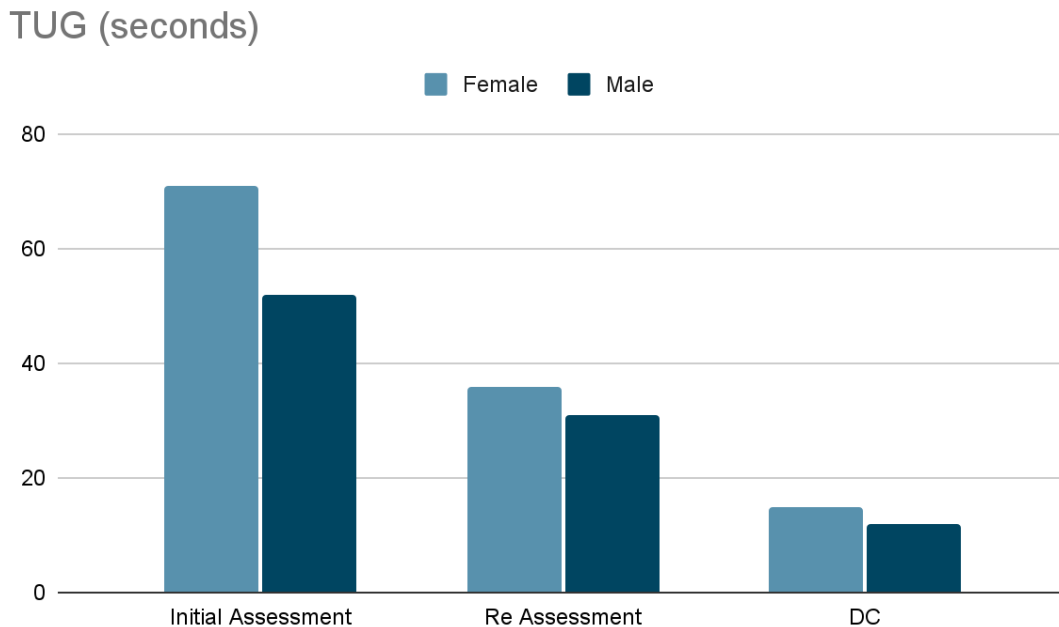


**Figure 1: Comparison of Hip Abduction (Abd) and External Rotation (ER) ROM.**

**Patient 2:** the male patient had an overall better improvement in the functional tests like TUG during reassessment and discharge visits. The male patient also required reduced assistance with ambulation prior to the female patient.

The female patient showed more improvement in TUG score from the time of the initial assessment but the male patient performed better and showed consistent improvement at all three phases.

Comparison of TUG between both patients at all 3 intervals are depicted in **FIGURE 2**.



**Figure 2: Comparison of TUG score at different intervals.**

## Discussion

Studies show that THA is one of the most successful surgeries in the world, and 86% of the patients have satisfying results<sup>4</sup>. Gender-based differences in outcomes post-THA have been studied in the past with improved functional activity participation and pain in males as compared to females. It compared outcomes immediately after the surgery and 12 months post surgery<sup>3,5</sup>.

This study examines different recovery trajectories of 82 year old male and a female patient undergoing left THA on the same day and treated with identical PT interventions by the same HHPT on the same days. While both patients demonstrated commendable overall improvement in ambulation, ROM and pain following six HHPT visits, there are observed divergences in their recovery patterns. This highlights the potential influence of gender in post operative rehabilitation outcomes.

The female patient's superior gains in hip ROM, particularly abduction and external rotation, may be attributed to inherent anatomical variations in

pelvic structure or potentially greater flexibility. Conversely, the male patient's more pronounced improvements in functional mobility, as evidenced by TUG scores and earlier reduction in ambulation assistance, could be influenced by factors such as greater baseline muscle mass or different biomechanical adaptations.

Additionally, hormonal differences also contribute to differences in pain perception and inflammation affecting the recovery pattern. These distinct recovery patterns underscore the critical importance of considering gender as a variable when developing individualized plans of care.

## Limitations

- Small sample size (n=2) limits the ability to generalize these findings to a larger population.
- Psychological and social factors like pain coping mechanisms, family support and expectations also play a vital role in recovery.
- Finally, even though both patients were treated by using similar PT interventions, the adherence to HEP could have been varied.

### Conclusion

This study highlights the need to explore rehabilitation protocols, consider potential gender based differences as an important variable when planning individualized therapy interventions. This will allow therapists to optimize treatment plans, enhance patient satisfaction post THA and maximize functional gains. Additional research with larger sample size is warranted to further study the differences observed in this study.

### Learning Points

- **Gender may play a crucial role in recovery following THA surgery :** Themale patient showed a better recovery in functional outcomes, whereas the female patient showed improved ROM.
- **Early intervention following THA:** Both patients started home health PT one day after surgery and had good outcomes.
- **An individualized plan of care can be key:** Formulating a plan based on gender and other factors is important to get the best results.

### Patient Consent

The author states that the research adhered to the principles of “The Declaration of Helsinki”, written informed consent was obtained from research participants before initiating the study. The

submitted manuscript has maintained confidentiality throughout, and the participants’ identity is not revealed in any form.

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**Conflict of Interest:** I declare that I have no personal or professional conflicts of interest related to this manuscript.

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