



EFFECTIVENESS OF A MULTI-FACETED REHABILITATION APPROACH IN A 39-YEAR-OLD POST-OP THA REVISION – A CASE REPORT



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Background

- Strength deficits of the quadriceps and glutes following total hip arthroplasty (THA) can persist for months and up to two years¹⁻⁴
- Blood flow restriction (BFR) training has emerged as an evidence-based modality, through both metabolic and mechanical stimuli, to improve muscle size and strength⁵
- Alter-G treadmills have been shown to enhance patient function, quality of life, and their ability to perform activities of daily living⁶
- This case describes a home-based BFR program utilizing both low load resistance training and Alter-G/land-based walking to increase muscle strength, circumference, endurance, and physical function

Intervention

Phase 1: 5 sessions of BFRT & 15 mins of Alter-G walking, at a self-selected pace in clinic

Phase 2: 8-week BFRT home exercise program consisting of progressive low load resistance training & a land-based walking program
LOP (mmHg): RLE: 200 | LLE: 184; Exercising LOP = 70% - **Rest during BFRT:** 30 secs between sets, 2 mins + deflate between exercises

BFRT Protocol (sessions 1-5)

Alter-G Protocol (sessions 1-5)

Exercise	Resistance	Sets/Reps	% BW	Time	Speed
1. Wall squats to 90 2. Supine bridges	1. Without band 2. Green t-band	1. 4 sets – 30-3x15 2. 4 sets – 30-3x15	65%	15 mins - 5 sets of 2 min bouts with 1 min rest btwn	2 mph
1. Wall squats to 90 2. Supine bridges	1. Green t-band 2. 10 lbs DB + green t-band	1. 4 sets – 30-2x15-5* 2. 4 sets – 30-3x15	75%	15 mins - 5 sets of 2 min bouts with 1 min rest btwn	2 mph
1. Lateral step downs 2. Double limb leg press	1. 6-inch box 2. 50 lbs + green t-band	1. 4 sets – 30-2x15-21* 2. 4 sets – 30-2x15-24*	75%	15 mins - 5 sets of 2 min bouts with 1 min rest btwn	2.5 mph
1. Lateral step downs 2. Single limb leg press	1. 6-inch box 2. 30 lbs	1. 4 sets – 30-3x15 2. 4 sets – 30x15x20x30*	85%	15 mins - 5 sets of 2 min bouts with 1 min rest btwn	2 mph
1. Lateral step downs 2. Static posterior lunge	1. 6-inch box (5 lbs KB offset last 2 sets) 2. BW	1. 4 sets – 30-3x15 2. 4 sets – 21-15-12-15*	85%	15 mins - 5 sets of 2 min bouts with 1 min rest btwn	2.5 mph

* = denotes pushed to failure

Blood flow was restricted in the LE bilaterally utilizing the SmartCuffs® in clinic, and the AirBands (VALD Performance) at home

Case Description

- 39-year-old male c/c of L hip pain with the following timeline:
 - 2005 - L hip THA in Brazil s/p MVA
 - July 2020 - L THA revision (hip precautions + trochanteric hip precautions)
 - October 2020 – L hip scar revision; irrigation/debridement with wound closure due to infection
 - November 2020 – Began PT
 - March 2021 – Initiated BFRT & Alter-G protocol
 - July 2021 – L hip hardware removal
- Occupation: Uber/Lyft driver & delivery for Amazon flex
- Avocation: Walking, table tennis (played in Brazil)

Outcomes (* = initiation of BFRT + Alter-G protocol)

Objective Outcomes	11/30/20	2/18/21	3/9/21*	3/23/21	5/27/21	9/14/21
PSFS	1.7	6.7		3.67		
-Squatting	0	3	-	5	-	
-Sitting	3	10		5		
-Walking	2	7		1		
LEFS	11	18	-	23	-	-
30secs STS (43 cm – norm 14-19)	-	-	9 (RPE 8)	17 (RPE 6)	16 (RPE 6)	18 (RPE 6)
Star Climb Test (10 steps – norm 7.92)	-	-	16.12 sec (RPE 9)	12.43 sec (RPE 7)	12.5 sec (RPE 7)	9.89 sec (RPE 2)
6 MWT (norm – 643m)	-	-	335m (RPE 8) Pain: 4 // 9	440m (RPE 5) Pain: 0 // 5	430m (RPE 3) Pain: 0 // 2	450m (RPE 1) Pain: 0 // 0
Quad Circumference (15 cm proximal to superior pole of patella)	-	-	L = 47.5 cm R = 50 cm	L = 50 cm R = 51.5 cm	L = 51.5 cm R = 51.5 cm	L = 50.5 cm R = 51 cm
Glut Med HHD - lbs (norm 71.1 lbs)	-	-	L = 10 R = 26	L = 11.6 R = 31	L = 13 R = 33	L = 22 R = 32

Clinical Significance

- Demonstrates application of two disparate evidence-based interventions that can be combined and translated into clinical practice to further enhance a patient's physical performance following a THA
- Demonstrates the successful application of a structured, semi-independent, BFRT & Alter-G/land-based walking program at increasing muscle strength, circumference, endurance, and physical function

References

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