

Effects of an Aquatic Therapy Program with Progression to Land Based Program for Adult Following THA and Multiple Revisions

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Introduction

According to the Centers for Disease Control and Prevention (CDC) Osteoarthritis (OA) is the most common form of arthritis. OA affects 33.6% of adults aged 65 and older an estimated 26.9 million adults in the US in 2005. Eighty-eight out of ten thousand of these patients will suffer from hip OA leading to hospitalizations and potentially hip replacement procedures. Patients suffering from OA who have opted to have a total hip replacement may present with barriers to conventional land based therapy due to inability to bear full weight on the affected extremity. Evidence has shown that aquatic therapy is a good initial intervention for THA patients. The unique qualities of water make it well matched for patients who are unable to exercise on land, or find land-based activity too demanding. Aquatic therapy provides an alternative strategy (Batterham, Heywood & Keating, 2011).

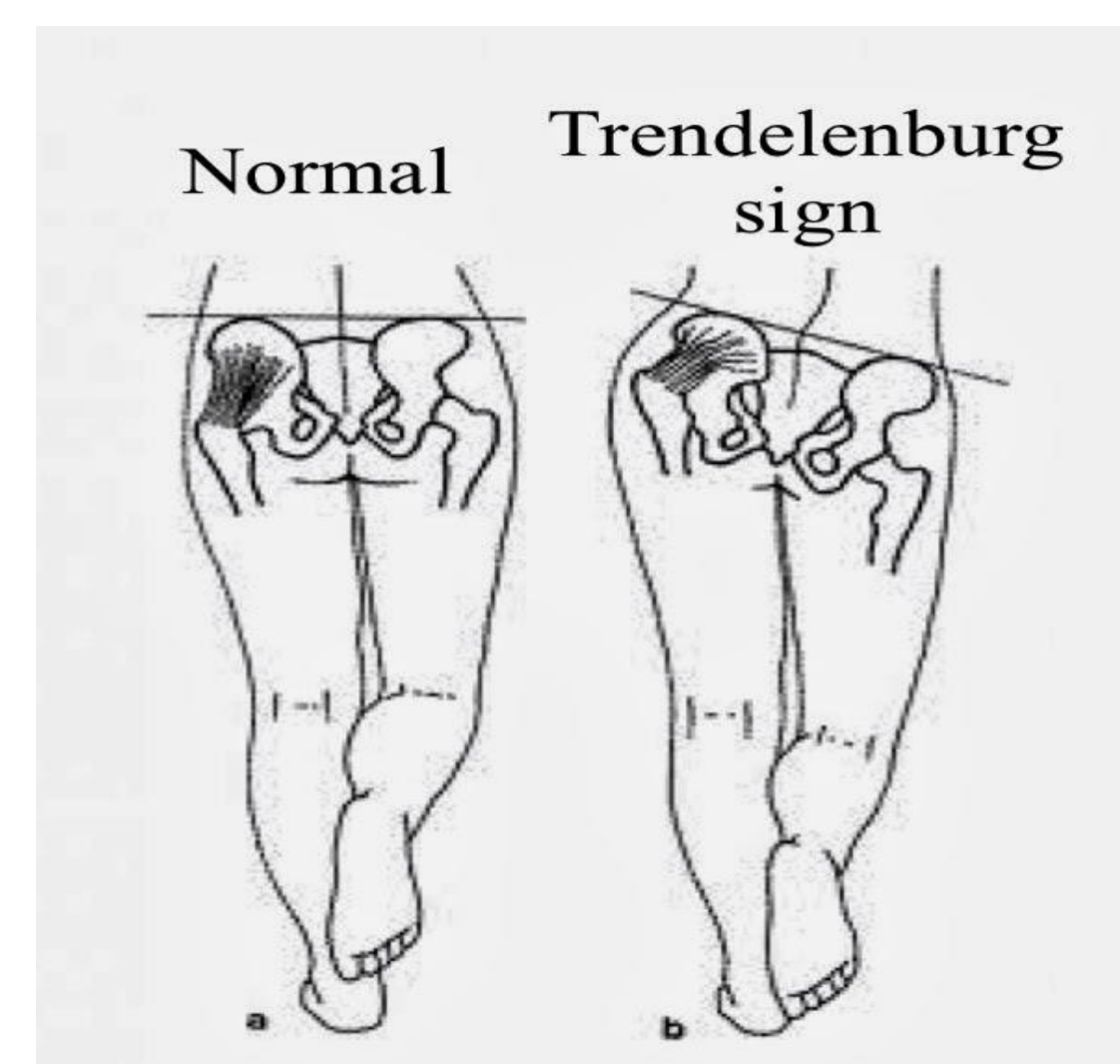
Purpose

The purpose of this case study is to describe the evaluation, intervention, and outcome of a patient following a THA with 3 subsequent revision surgeries. The patient successfully participated in an aquatic therapy program. He was then progressed to a land based program.

Patient Description

The patient is a 54-year-old male referred to physical therapy following a THA and 3 revision surgeries. Impairments included: impaired gait, positive Trendelenberg, impaired balance, and overall decrease in functional mobility. The aquatic therapy sessions were three times per week for the initial 4 weeks then the patient was progressed to land based therapy for an additional 8 weeks.

Positive Trendelenberg Sign



Unique Aquatic Benefits

Buoyancy

Percentage of body weight off-loaded with increasing immersion depth

Turbulent

Laminar

Hydrostatic Pressure

Temperature

Higher temperatures	Lower Temperatures
<ul style="list-style-type: none"> The higher the temperature the more intense the local or biophysical effects 84-92 degrees Arthritis Fibromyalgia Frail Pain 	<ul style="list-style-type: none"> Systemic or localized cold water decreases HR decreasing Prenatal (82-88) Obese (82-88) MS Cardiac

Interventions

The aquatic program included progressive strengthening, gait training, and balance activities.

Jun 20, 2014

GAIT - 1 Forward Walk Step forward with one leg. Strike pool bottom with heel. Rolling over foot, bring other leg forward. Session: Walk 2 minutes. Do 2-3 sessions per week. Arm movement: X Swing, elbows straight (UEP-1) — Swing, elbows bent (UEP-2) — Breaststroke (UEP-3)	GAIT - 2 Backward Walk Step backward with one leg. Strike pool bottom with front of foot. Rolling back onto foot, bring other leg backward. Session: Walk 2 minutes. Do 2-3 sessions per week. Arm movement: X Swing, elbows straight (UEP-1) — Reverse breaststroke (UEP-4) — Figure eight (UEP-6)	GAIT - 3 Side Step Move one leg out to side with knee slightly bent, then bring other leg to it. Session: Walk 2 minutes. Do 2-3 sessions per week. Arm movement: — Figure eight (UEP-6) — Diagonal up, out (UEP-9) X Horizontal abduction/adduction (UEP-10)
LOWER BODY - 24 Toe / Heel Raise Gently rock back on heels and raise toes. Then rock forward on toes and raise heels. Repeat sequence 15-20 times per session. Do 2-3 sessions per week.	TRUNK - 1 Pelvic Posterior Tilt Stand with upper back and buttocks touching pool wall, feet 6 inches from wall, knees relaxed. Contract abdominal muscles, flattening low back against wall. Repeat 15-20 times per session. Do 2-3 sessions per week. Progression: Perform pelvic tilt away from wall.	LOWER BODY - 2 Hip Flexion, Knee Bent Lift right leg toward chest with knee bent. Repeat 15-20 times per session. Do 2-3 sessions per week.
LOWER BODY - 3 Hip Extension, Knee Bent Bend right knee to 90°. Move leg back with same knee bent. Repeat 15-20 times per session. Do 2-3 sessions per week.	LOWER BODY - 4 Hip Flexion, Knee Straight Lift right straight leg forward and up 6 inches. Repeat 15-20 times per session. Do 2-3 sessions per week.	LOWER BODY - 6 Hip Horizontal Abduction / Adduction, Knee Bent Lift and bend left leg. Move same leg out to side, then back to midline. Repeat sequence 15-20 times per session. Do 2-3 sessions per week.
LOWER BODY - 8 Hip Lateral Abduction / Adduction To Midline Lift right leg out to side. Keep knee straight. Pull leg down to start. Repeat sequence 15-20 times per session. Do 2-3 sessions per week.	LOWER BODY - 17 Squat Bend both knees lowering body. Straighten knees and raise body. Repeat 15-20 times per session. Do 2-3 sessions per week.	TOTAL BODY MOVEMENTMENT - 1 Lunge Forward Take large step forward moving legs and opposite arms forward. Back leg remains straight. Return by straightening knee and ankle and pushing back with forward foot. Repeat 15-20 times each side, alternating to complete a session. Do 2-3 sessions per week.

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Results

Following the three week aquatic program the patient reported a significant decreases in subjective pain levels. He also demonstrated increased static standing balance with improved hip stabilization. He further demonstrated improved strength, increased weight bearing tolerance, and increased functional mobility. Results were revealed by manual muscle testing, improved activities of daily living, and subjective increased functional mobility. This case report advocates that aquatic therapy may be valuable for patients with impaired weight bearing tolerance that would not be able to progress with land therapy or are unable to tolerate land activities.

Strength

Table 1	Initial Exam	Discharge
	Right Lower Ext.	Right Lower Ext.
Hip Abduction	+2/5	4/5
Hip Flexion	-3/5	4/5
Hip External Rot.	-3/5	4/5
Knee Flexion	3/5	+4/5
Knee Ext	3/5	+4/5
Dorsiflexion	-3/5	5/5
Plantarflexion	4/5	5/5
Gr. Toe Ext	-3/5	5/5

