Golf Specific Functional Assessment and Exercises to Improve Hip Rotation Limitations : A Case Report

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INTRODUCTION

Golf has become an increasingly popular and distinctive sport for players of all ages, sex, and athleticism all across the world. A report from 2003 stated that there were in excess of 55-million golfers worldwide (Lephart, Smoliga, Myers, Sell & Tsai, 2007). As of 2004, national golf statistics demonstrated that in the United States, there were more than 12 million US golfers who played a minimum of eight rounds in a given year (Sell, Tsai, Smoliga, Myers, & Lephart, 2007). Several techniques to improve golf performance have been implemented and three specific techniques have been described in recent studies. One way that golfers are improving is by utilizing the technology available in the latest equipment. Another strategy being used is the improvement of swing mechanics, as taught by PGA professionals or certified golf instructors. A third mechanism of golf improvement that is being utilized is enhancing swing biomechanics through the use of physical training, as taught by movement professionals such as physical therapists or strength and conditioning coaches.

ABSTRACT

Greater range of motion for hip internal rotation in the trail leg of a right-handed golfer is a characteristic shared by golfers who perform at a high level. Improving right hip internal rotation can be an effective way of improving the proficiency of an amateur golfer. A 42-year-old male consulted his sports medicine specialist because of decreased bilateral hip range of motion and bilateral hip pain that he determined to be the cause of his increased golf handicap index. He was referred to outpatient fitness training where he revealed that his pain symptoms were: prolonged sitting and walking, multiple golf swings, and playing golf for longer than one hour. At the time of initial assessment, no previous interventions had been provided. During the initial assessment, a TPI Certified Level 3 Golf Medical and Fitness Professional administered a Titleist Performance Institute (TPI) functional screen. This functional screen consisted of sixteen separate assessments to determine the clients golf fitness level, and was used to decide the exercise interventions prescribed. Additional assessments included objective measurements of bilateral active hip flexion and internal rotation range of motion, manual muscle testing of bilateral hip flexion, internal rotation, and external rotation, as well as conducting a self reported numeric pain rating scale survey.

The intervention plan consisted of twenty-four treatment sessions over an eight-week period. Each session entailed completing ten dynamic exercises, all of which were supervised by the assessing TPI professional. These exercises focused on increasing bilateral hip mobility and strength. Objective measurements were taken again at the end of the eight weeks, and there were noted increases in strength and range of motion, as well as a note decrease in pain levels.

This case illustrates the potential for specific exercises based on a functional assessment to improve measurable aspects that can improve golf performance.

APPLICATION OF THEORY TO PRACTICE

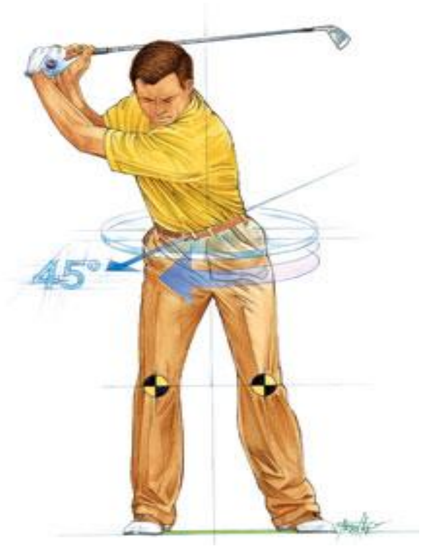
Based on the findings of the initial TPI Screen, subsequent treatment sessions focused on implementation of an exercise prescription intervention with components targeting (1) bilateral hip musculature weakness and (2) decreased bilateral hip ROM. To address these deficits, the therapeutic program consisted of ten dynamic exercises. The client performed these exercises three times per week with the guidance of the TPI Golf Medical and Fitness Professional. Therapeutic exercises were progressed from an emphasis on increasing mobility, followed by exercises dosed for increasing strength. For weighted resistance exercises, a 5% increase in load was applied when the client was able to perform the workload for 2 repetitions over the desired number on two consecutive training sessions.

OUTCOMES

The client attended 24 treatment sessions over the course of 8 weeks, in addition to the initial and follow-up examinations. Outcomes were recorded at the initial evaluation and after completion of eight weeks of training (**Figure 1**). The client's golf handicap index was not assessed at the completion of eight weeks. The United States Golf Association requires 20 rounds of golf to be calculated, and the client did not participate in enough rounds of golf throughout the eight weeks of training for a handicap index to be calculated (U.S.G.A., 2015). At the follow-up examination, the patient reported 1/10 hip pain intensity at the completion of a round of golf.

Figure 1. Physical Examination Key Findings

Test or Measure	Initial Examination	Follow-up Examination (8 wk)
Right hip active ROM, deg		
Flexion	90	90
Internal Rotation	15	32
Left hip active ROM, deg		
Flexion	60	82
Internal Rotation	22	38
Right hip MMT		
Flexion	4/5	4+/5
Internal Rotation	3+/5	4/5
External Rotation	4-/5	4/5
Left hip MMT		
Flexion	4-/5	4+/5
Internal Rotation	4-/5	4+/5
External Rotation	4-/5	4+/5
NPRS hip pain (0-10)		
Right hip	5	1
Left hip	5	1



INTERVENTIONS

Client Hip Exercises
10 Exercises Duration: 45 mins - 1 hr each session

1) 25-25-25 3 sets
2) Comerford Hip Complex 1 set
3) Flow Row 2 sets
4) Burpee Advanced 2 sets
5) Med-Ball Straight Arm Tornadoes 2 sets
6) Deadlift with Dumbells 3 sets
7) Lift - Resisted Rotation Split Stance 2 sets
8) Chop - Cable Resisted Two Arms Two Handles Split Stance 2 sets
9) Two Arm Cross Body Lat Stretch 2 sets
10) Hip Internal Rotation Mobilization with Movement

DISCUSSION

At initial examination, the client's right hip active internal rotation was only 15 degrees. Hip mobility accounts for approximately 10% of the linear velocity produced in the downswing. Relative right hip internal rotation during the backswing of less than 30 degrees causes the pelvis to ascend and shift laterally to the right. This lateral shift reduces the amount of clubhead speed available at the start of the downswing. Following the 8-week intervention program, the clients right hip active internal rotation improved to 32 degrees, an improvement of over 53%. Left hip active internal rotation improved from 22 degrees to 38 degrees, an improvement of over 42%. The client also demonstrated improved bilateral hip strength for flexion, internal rotation, and external rotation. A previous study by Sell et al. showed that an 8-week training program that improved hip strength and flexibility resulted in improved clubhead speed, ball speed, carrying distance, and total ball distance. Future studies will benefit from a follow-up TPI functional screen to monitor any improvements in the client's golf fitness level.

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