Journal of Science and Medicine in Sport 17 (2014) 155–159

Contents lists available at ScienceDirect

Journal of Science and Medicine in Sport

journal homepage: www.elsevier.com/locate/jsams

Original research

Adductor squeeze test values and hip joint range of motion in Gaelic football athletes with longstanding groin pain

Fiona Nevin [a], Eamonn Delahunt [a,b,*]

[a] School of Public Health, Physiotherapy and Population Science, University College Dublin, Dublin, Ireland
[b] Institute for Sport and Health, University College Dublin, Dublin, Ireland

ARTICLE INFO

Article history:
Received 9 November 2012
Received in revised form 27 March 2013
Accepted 5 April 2013
Available online 15 May 2013

Keywords:
Muscle strength
Athletic injuries
Articular range of motion
Hip injuries

ABSTRACT

Objectives: The objective of the present study was to investigate whether differences exist in adductor squeeze test values and hip joint range of motion between athletes with longstanding groin pain and injury-free controls.
Design: Observational study with a case control design.
Methods: Eighteen Gaelic football players with current longstanding groin pain and 18 matched injury-free controls were assessed on their performance of the adductor squeeze test. Adductor squeeze test values were quantified using a sphygmomanometer. A fluid-filled inclinometer was used to assess hip joint internal and external rotation range of motion. A bent knee fall-out test was also utilised to examine hip joint range of motion.
Results: A significant difference in adductor squeeze test values was observed between the control group (269 ± 25 mmHg) and longstanding groin pain group (202 ± 36 mmHg; $p < 0.01$). Furthermore the longstanding groin pain group had a decreased bent knee fall-out ($p < 0.01$) bilaterally, as well as decreased hip joint internal rotation ($p < 0.05$) and hip joint external rotation ($p < 0.05$) range of motion bilaterally when compared to the control group.
Conclusions: Gaelic football players with longstanding groin pain exhibit decreased adductor squeeze test values and hip joint range of motion when compared to non-injured players. These findings have implications for assessment and rehabilitation practices, as well as return to play criteria.

1. Introduction

Longstanding groin injuries are a considerable challenge for athletes and clinicians owing to their association with significant time-loss from sport,[1] high rates of recurrence,[2] and reduced level of sporting function on return to play.[3] They are difficult to diagnose and consequently even more difficult to treat.[4] Groin injuries are frequently encountered in field sports.[5] They represent 9% of all Gaelic football injuries,[6] an intermittent high intensity football code sport[7] with kicking and fielding skills comparable with those of Australian Rules football.

Despite the high prevalence of groin pathology,[5] there is a dearth of literature relating to the clinical indicators of longstanding groin injuries. It is unclear whether basic clinical parameters such as hip joint range of motion (ROM) and strength differ between athletes who are currently injured and those who have never sustained a groin injury. The adductor squeeze test is a widely used clinical test for groin pathology.[8,9] It involves forceful bilateral isometric hip adduction with the subjective reporting of pain by the athlete constituting a positive test.[8] It is also used as an indirect measure of adductor strength which can be reliably quantified with a dynamometer[10] or a sphygmomanometer.[11] The preponderance of research concerning the adductor squeeze test has focussed, however, on healthy athletes, while investigations among pathological populations have yielded conflicting results.[12,13]

The findings in the literature relating to hip joint ROM among athletes with longstanding groin pain are also equivocal. There is some preliminary evidence that athletes with current groin pain have decreased hip joint ROM compared to their non-injured counterparts.[14,15] However small sample sizes and differing test positions employed preclude firm conclusions from being drawn. Furthermore hip joint ROM has not been documented in Gaelic football athletes with longstanding groin pain.

A better understanding of adductor squeeze values and hip joint ROM in athletes with longstanding groin pain compared to injury-free individuals is needed. This could be utilised for classifying groin injuries,[16] for monitoring and advancing rehabilitation and potentially for evaluating return to play readiness. The aim of the present investigation, therefore, was to explore whether differences in adductor squeeze test values and hip joint rotation ROM

* Corresponding author.
E-mail address: eamonn.delahunt@ucd.ie (E. Delahunt).

1440-2440/$ – see front matter
http://dx.doi.org/10.1016/j.jsams.2013.04.008

exist between Gaelic footballers with and without longstanding groin pain. We hypothesised that Gaelic footballers with longstanding groin pain would exhibit decreased adductor squeeze test values as well as decreased hip joint ROM compared to activity matched non-injured athletes.

2. Methods

An *a priori* sample size calculation was undertaken using G*Power 3.1.6[17] based on previously published work by Malliaras et al.[13] Using the calculated effect size (1.13) for differences in adductor squeeze test values and the following values, α error probability = 0.05, power ($1-\beta$ error probability) = 0.85 and an allocation ratio of N2/N1 = 1, it was calculated that 16 athletes per group was required. Eighteen male club-level Gaelic football athletes with current longstanding groin pain (age = 23.89 ± 3.18 years, body mass = 80.28 ± 9.77 kg, height = 1.79 ± 0.06 m, duration out of sport 3.44 ± 2.41 weeks) volunteered to participate in the study. Nine athletes had right-sided groin pain, five left-sided and four had bilateral groin pain. The more symptomatic side was recorded as the injured side for participants with bilateral groin pain. Recruitment of participants with a current injury was by means of referral from clinicians who were informed *via* email of the study. Inclusion criteria for injured athletes were: (1) current groin pain due to sport of at least six weeks duration; (2) pain on palpation of the adductor tendons, their insertion onto the pubic rami or pubic symphysis; (3) presence of pain during resisted adduction. Athletes were excluded if they had: (1) palpable inguinal or femoral hernia or pain felt above the conjoint tendon (2) clinical signs or symptoms of prostatitis or urinary tract infection, (3) back pain felt from T10 to L5, (4) osteoarthritis of the hip joint or (5) clinical suspicion of a nerve entrapment syndrome. Criteria were assessed *via* direct interview and a reliable, standardised clinical examination.[9] Eighteen injury-free controls matched for age, height, weight and playing club-level Gaelic Football (age 23.83 ± 3.55 years, weight 72.28 ± 10.3 kg, height 1.80 ± 0.06 m) volunteered to participate in the study. Injury-free athletes were recruited by means of posters placed on sports club notice boards. Ethical approval was granted by the University Human Research Ethics Committee. All participants gave written, informed consent.

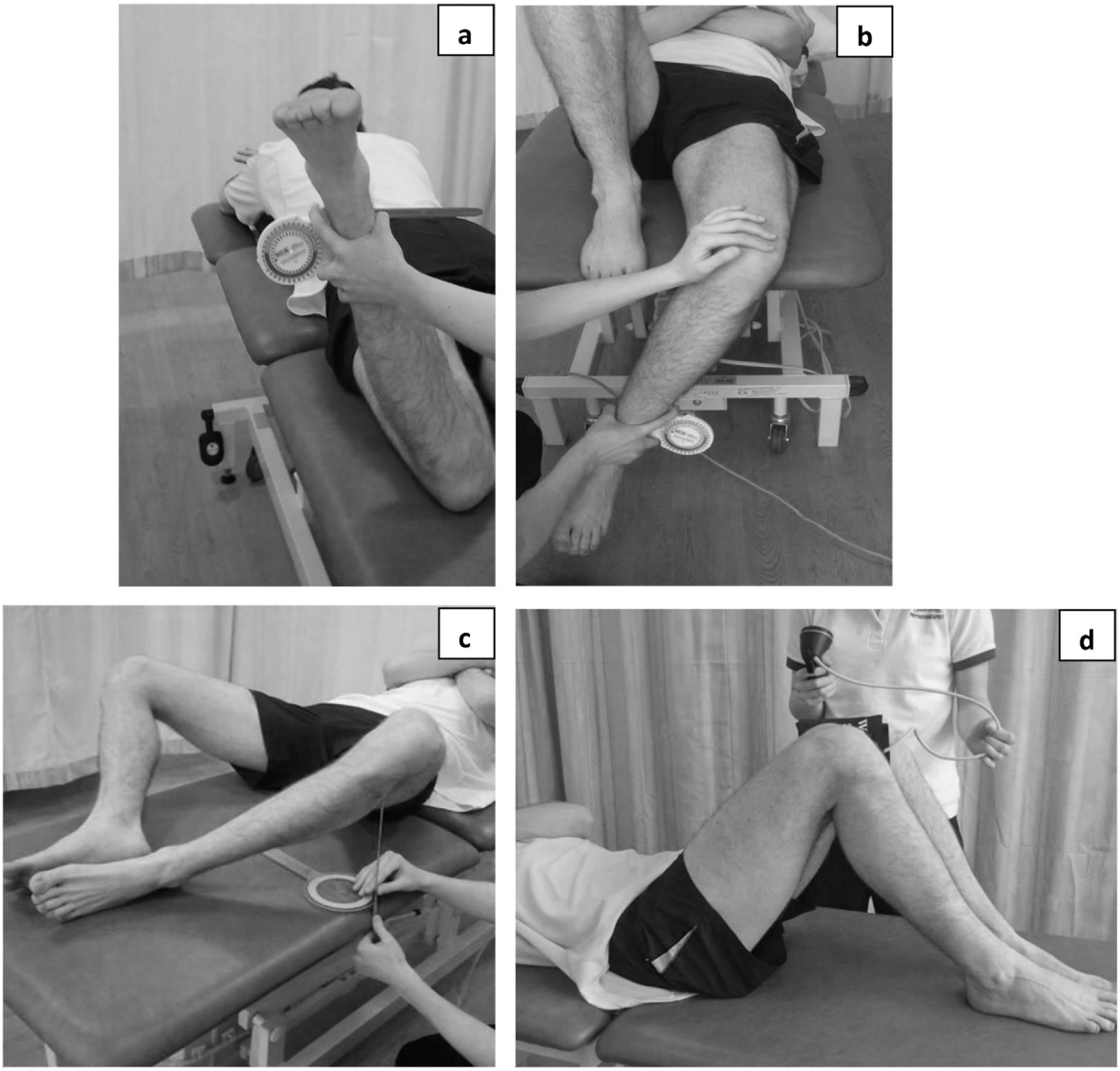

Fig. 1. (a) Passive hip internal rotation range of motion with a fluid-filled inclinometer; (b) passive hip external rotation range of motion with fluid-filled inclinometer; (c) the bent knee fall out test with a rigid tape measure used to measure the distance from head of fibula to the plinth; (d) the adductor squeeze test using a sphygmomanometer at 45° of hip flexion.