

High load injuries in the adolescent athlete's hip

CLINICAL AND EXPERIMENTAL STUDIES
AND OUTCOME MEASURES

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien,
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av

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Leg läkare

Fakultetsopponent:
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Avhandlingen baseras på följande arbeten:

I. Jónasson P, Thoreson O, Sansone M, Svensson K, Swärd A, Karlsson J, Baranto A. The morphologic characteristics and range of motion in the hips of athletes and non-athletes.
Submitted.

II. Jónasson P, Ekström L, Swärd A, Sansone M, Ahldén M, Karlsson J, Baranto A. Strength of the porcine proximal femoral epiphyseal plate: the effect of different loading directions and the role of the perichondrial fibrocartilaginous complex and epiphyseal tubercle – an experimental biomechanical study.
J Exp Orthopaedics 2014; 1:4.

III. Jónasson P, Ekström L, Hansson H-A, Sansone M, Karlsson J, Swärd L, Baranto A. Cyclical loading causes injury in and around the porcine proximal femoral physal plate: proposed cause of the development of cam deformity in young athletes
J Exp Orthopaedics 2015; 2:6.

IV. Jónasson P, Baranto A, Karlsson J, Swärd L, Sansone M, Thomeé C, Ahldén M, Thomeé R. A standardised outcome measure of pain, symptoms and physical function in patients with hip and groin disability due to femoroacetabular impingement: cross-cultural adaptation and validation of the international Hip Outcome Tool (iHOT12) in Swedish.
Knee Surg Sports Traumatol Arthrosc 2014; 22(4): 826-34.

V. Thomeé R, Jónasson P, Thorborg K, Sansone M, Ahldén M, Thomeé C, Karlsson J, Baranto A. Cross-cultural adaptation to Swedish and validation of the Copenhagen Hip and Groin Outcome Score (HAGOS) for pain, symptoms, and physical function in patients with hip and groin disability due to femoro-acetabular impingement.
Knee Surg Sports Traumatol Arthrosc 2014; 22(4): 835-42.

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Abstract

The diagnosis and treatment of hip and groin symptoms has often been a problem area in orthopaedics and sports medicine. Hip and groin pain and injuries are common among athletes and in the increasingly active population. In recent years, femoroacetabular impingement (FAI) has emerged as one of the most common causes of hip and groin disability in this group and it is a known risk factor in the development of osteoarthritis (OA) of the hip. Technical advancement and improved instruments have made surgical hip arthroscopy the mainstay treatment option in patients with debilitating FAI and the indications for hip arthroscopy are increasing.

The aetiology of FAI is not known. Several theories have been proposed. One of them is that a growth disturbance in the proximal femur, caused by heavy loads during skeletal maturation, is a factor in FAI development. FAI has been seen to be more common in athletes in certain sports, leading to pain, reduced range of motion (ROM) and performance.

Despite the increase in the number of hip arthroscopies that are performed, outcome measurements for the young and middle-aged, active patient with hip and groin pain have been lacking. Other instruments developed for older patients with osteoarthritis of the hip have been used, but their psychometric properties in this patient group are deficient.

In a clinical study, the morphological characteristics and ROM of the hips were compared in a group of athletes and a group of non-athletes. No difference in hip morphology was found between the groups, but the athletes had significantly lower ROM and osteoarthritis was more common among the athletes.

The strength of the porcine proximal femoral physis was investigated in two biomechanical studies. The physal plate was found to be the weakest point in the proximal femur. Injuries were seen after repeated physiological loading in and around the physal plate both on MRI and histologically.

Two patient-reported outcome measurements (HR-PROMs) developed for these patient groups were found, the iHOT12 and HAGOS. Using standardised methods, the HR-PROMs were translated and adapted to Swedish and the Swedish versions were tested in a clinical study to measure their psychometric properties.

Morphological changes of FAI increase the risk of OA development. Injuries created in and around the physal plate in the proximal femur during physiological loads can lead to morphological changes and FAI. The Swedish versions of the iHOT12 and HAGOS have good psychometric properties and can be used clinically and for research.

Keywords: hip, groin, athlete, adolescent, femoroacetabular impingement, cam, pincer, osteoarthritis, porcine, epiphysal plate, growth, validity, reliability, iHOT, HAGOS

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