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HaHamstring Strain Injuries: Factors that Lead to Injury and Re-Injury.

Opar DA, Williams MD, Shield AJ.: Sports Medicine (Auckland, N.Z.) Mar 2012,42(3):209-26.

Hamstring strain injuries (HSIs) are common in a number of sports and incidence rates have not declined in recent times. Additionally, the high rate of recurrent injuries suggests that our current understanding of HSI and re-injury risk is incomplete. Whilst the multifactorial nature of HSIs is agreed upon by many, often individual risk factors and/or causes of injury are examined in isolation. This review aims to bring together the causes, risk factors and interventions associated with HSIs to better understand why HSIs are so prevalent. Running is often identified as the primary activity type for HSIs and given the high eccentric forces and moderate muscle strain placed on the hamstrings during running these factors are considered to be part of the aetiology of HSIs. However, the exact causes of HSIs remain unknown and whilst eccentric contraction and muscle strain purportedly play a role, accumulated muscle damage and/or a single injurious event may also contribute. Potentially, all of these factors interact to varying degrees depending on the injurious activity type (i.e. running, kicking). Furthermore, anatomical factors, such as the biarticular organization, the dual innervations of biceps femoris (BF), fibre type distribution, muscle architecture and the degree of anterior pelvic tilt, have all been implicated. Each of these variables impact upon HSI risk via a number of different mechanisms that include increasing hamstring muscle strain and altering the susceptibility of the hamstrings to muscle damage. Reported risk factors for HSIs include age, previous injury, ethnicity, strength imbalances, flexibility and fatigue. Of these, little is known, definitively, about why previous injury increases the risk of future HSIs. Nevertheless, interventions put in place to reduce the incidence of HSIs by addressing modifiable risk factors have focused primarily on increasing eccentric strength, correcting strength imbalances and improving flexibility. The

response to these intervention programmes has been mixed with varied levels of success reported. A conceptual framework is presented suggesting that neuromuscular inhibition following HSI may impede the rehabilitation process and subsequently lead to maladaptation of hamstring muscle structure and function, including preferentially eccentric weakness, atrophy of the previously injured muscles and alterations in the angle of peak knee flexor torque. This remains an area for future research and practitioners need to remain aware of the multifactoral nature of HSIs if injury rates are to decline.

Physical Examination of the Overhead Athlete's Shoulder.

Sewick A, Kelly JD, Rubin B.: Sports Medicine and Arthroscopy Review, Mar 2012, 20(1):11-5.

Overhead athletes seek the services of an orthopedic surgeon because of pain and/or dysfunction. It is important to address the cause of the symptoms more so than the source of the patient's pain, so that treatment will eliminate the problem rather than merely ameliorate symptoms temporarily. In order to accomplish a thorough assessment of shoulder function, the examiner must expand his/her view from isolated assessment of the glenohumeral joint range of motion, stability, assessment of rotator cuff strength, palpation and provocative maneuvers, and add assessment of the shoulder in the context of the kinetic chain. The examination of the thrower's shoulder, coupled with a thorough history, will usually provide a solid functional diagnosis and provide a good idea as to the presence of structural damage. As a result, the value of rehabilitation and the benefit of surgical intervention are made more predictable.

Rehabilitation After Surgical Management of the Thrower's Shoulder.

Leggin BG, Sheridan S, Eckenrode BJ.: Sports Medicine and Arthroscopy Review, Março 2012, 20(1):49-55.

The overhead throwing motion is a complex and coordinated movement pattern involving the lower extremities, the trunk, and the upper extremity. Because of these tremendous demands on the shoulder, various shoulder injuries may occur. Two of the more common injuries to throwers are shoulder instability and superior labrum anterior-posterior lesions. Although nonoperative treatment is frequently successful in treating these conditions, surgical management may be necessary for the athlete to return to their sport. The purpose of this article is to review the first 3 phases of rehabilitation after arthroscopic capsular stabilization and superior labrum anterior-posterior debridement or repair. The fourth phase, return to throwing, will be covered in the final section.

Radiographic findings in restrained hip joints associated with ACL rupture.

Ellera Gomes JL, Palma HM, Becker R. Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA, 2010, 18(11):1562-7. School of Medicine, Universidade Federal do Rio Grande do Sul, Hospital de Clínicas de Porto Alegre, Rua Ramiro Barcelos, Porto Alegre, Brazil.

Although decreased hip range of motion has been detected in many soccer players with noncontact anterior cruciate ligament (ACL), it is not clear whether it is associated with bone spurs, capsular soft tissue stiffness or both. Our aim was to investigate abnormal radiographic findings in soccer players with limited hip range of motion and noncontact ACL injury. Fifty consecutive male soccer players with restricted hip range of motion and noncontact ACL injury were subjected to radiographic examination to identify bone changes that could be associated with decreased hip range of motion. Of 50 patients, 56% revealed abnormal radiographic findings: pericapsular calcifications or acetabular rim osteophytes (24%), femoral neck deformity (10%), femoral neck and acetabular rim disorders (18%), neck groove caused by impingement (4%). Radiographic evaluation of those individuals showed a high number of bone abnormalities around the hip joint. This was considered to be an important finding to guide a decision-making process between three different approaches: changing the type of sports practiced, undergoing a more restrictive surgery (such as a double-bundle intra-articular reconstruction or an intra plus

extra technique) or the onset of a hip-stretching program in addition to the conventional ACL rehabilitation protocol. In this last option, ACL-operated patients without radiographic hip abnormalities may have better outcomes for their decreased hip range of motion when submitted to a stretching program targeting the prevention of rotational overload on the reconstructed intra-articular grafts. The decision-making process concerning soccer players with ACL ruptures should take into consideration the amount of motion-limiting abnormalities around the hip joint.

Extensor hood syndrome--osteophytic irritation of digital extensor tendons in rock climbers.

Schöffel V, Hochholzer T, Schöffel I, Wilderness & environmental medicine, 2010 21(3):253-6, Department of Sportorthopedics, Klinikum Bamberg, Bamberg, Germany.

OBJECTIVE: Injuries to the flexor tendons and flexor tendon pulleys are frequently reported in rock climbers. Osteoarthritic changes with bone spurs are also well known. We report on the less commonly described extensor tendon irritation caused by such osteophytes. **METHODS:** Thirteen high-level rock climbers (12 men, 1 woman; average age 33.8 years [range 17-55]; average years of climbing experience 19 [range 5-30]; average climbing level 10.2) with extensor hood irritation caused by dorsally located osteophytes of proximal interphalangeal (n = 10) or distal interphalangeal joints (n = 3) were evaluated and managed. Twelve climbers received conservative therapy and 1 climber was treated surgically. **RESULTS:** Before treatment, the climbers were unable to achieve their normal climbing ability due to extensor tendon irritations with resultant effusion noted in the ultrasound examinations. After conservative treatment, and in 1 case surgery, all patients achieved their previous climbing ability. **CONCLUSION:** While all climbers were able to achieve their former climbing level after treatment, the condition is progressive and the osteoarthritic changes will likely cause further problems for these individuals in the future. Extensor hood irritation must be considered in the differential diagnosis of finger pain in rock climbers.

Effect of walking speed and severity of hip osteoarthritis on gait variability.

Kiss RM.: Journal of electromyography and kinesiology : official journal of the International Society of Electrophysiological Kinesiology . 2010, 20(6):1044-51. Budapest University of Technology and Economics, Dept. of Structures, 1111 Budapest, Bertalan Lajos 2, Hungary.

Gait analysis in orthopaedic and neurological examinations is important; however, few studies assess gait variability at different walking speeds in patients with varying degrees of hip osteoarthritis. We aimed to clarify (1) how different controlled speeds and (2) various severities of hip osteoarthritis influence gait variability. Gait variability was described by the standard deviation (SD) of the spatial-temporal and mean standard deviation (MeanSD) of angular parameters. The spatial positions of the anatomical points for calculating gait parameters were determined in 20 healthy elderly controls and 20 patients with moderate and 20 patients with severe hip osteoarthritis with a zebris CMS-HS ultrasound-based motion analysis system at three walking speeds. The SD of the spatial-temporal and MeanSD of angular parameters of gait, which together describe gait variability, significantly depended on speed and osteoarthritis severity. The lowest variability in the gait was found near the self-selected walking speeds. Hip joint degeneration significantly worsened variability on the affected side, with non-affected joints and the pelvis compensating by increasing flexibility and adapting to step-by-step motions. Particular attention must be paid to improving gait stability and the reliability of limb movements in the presence of and increasing severity of osteoarthritis.

Magnetic resonance imaging-documented chondral injuries about the knee in college football players: 3-year national football league combine data.

Hirshorn KC, Cates T, Gillogly S.: Arthroscopy : the journal of arthroscopic & related surgery : official publication of the Arthroscopy Association of North America and the Internation

2010,

26(9):1237.-

Atlanta Medical Center, Georgia 30307, USA.

PURPOSE: To evaluate the incidence and risk factors for knee cartilage injury in elite college football players invited to attend the US National Football League (NFL) Scouting Combine over a 3-year period. **METHODS:** All players entering the NFL Scouting Combine (National Invitational Camp) from 2005 through 2007 were evaluated. "At-risk" knees underwent magnetic resonance imaging (MRI), and the results were evaluated for chondral injuries. **RESULTS:** During the 3-year period reviewed, a total of 980 players were available for analysis, and a total of 516 players' knee MRI scans were obtained (53% of all players at the Combine). The total number of full-thickness chondral injuries evident on MRI was 197 (20.1%) among all players, or 38.2% of the players who had an MRI scan. Of the players, 30 (3.06% of all players at the Combine, or 5.8% of the players who had an MRI scan) had isolated medial compartment full-thickness chondral injuries, 41 (4.2%, or 7.9%) had isolated lateral compartment full-thickness chondral injuries, 48 (4.9%, or 9.3%) had patellofemoral compartment full-thickness chondral damage, and 78 (7.96%, or 15.1%) had full-thickness chondral injuries in more than 1 compartment. **CONCLUSIONS:** The epidemiologic and risk assessment data presented in this study offer a cross-section of a young and elite athletic population who were "prescreened" at the NFL Combine over a 3-year period and judged to have at-risk knees. The total number of full-thickness chondral injuries evident on MRI was 197 (20.1%) among all players, or 38.2% of the players who had an MRI scan: 30 players (3.06%, or 5.8%) had an isolated medial compartment full-thickness chondral injury, 41 players (4.2%, or 7.9%) had an isolated lateral compartment full-thickness chondral injury, 48 players (4.9%, or 9.3%) had isolated patellofemoral compartment full-thickness chondral damage, and 78 players (7.96%, or 15.1%) had full-thickness chondral injuries in more than 1 compartment. **LEVEL OF EVIDENCE:** Level IV, diagnostic study.

Osseous deficits after anterior cruciate ligament injury and reconstruction: a systematic literature review with suggestions to improve osseous homeostasis.

Nyland J, Fisher B, Brand E, Krupp R, Caborn DN.: Arthroscopy : the journal of arthroscopic & related surgery : official publication of the Arthroscopy Association of North America and the Internation

201009 26(9):1248-57. Department of Orthopaedic Surgery, University of Louisville, Kentucky 40202, USA.

PURPOSE: This systematic review was performed to improve our understanding of the current evidence regarding the influence of anterior cruciate ligament (ACL) injury and reconstruction on involved lower extremity apparent bone mineral density, bone content, or bone area mass (bone integrity). **METHODS:** Two independent reviewers performed a Medline search from 1966 to January 2010 using the terms "anterior cruciate ligament" or "ACL" combined with "wound" or "injury" and "bone density" or "osteoporosis." Study inclusion criteria were English-language human studies. Reference sections of selected studies were also reviewed. **RESULTS:** Ten studies were identified that met our inclusion criteria. Eight studies performed ACL reconstruction with bone-patellar tendon-bone autografts and interference screw fixation. One study performed ACL reconstruction by use of Achilles tendon allografts with interference screw and staple fixation. Two ACL injury studies either did not involve ACL reconstruction or attempted primary repair with sutures. All studies reported varying levels of decreased bone mineral density, bone content, or bone area mass (bone integrity) at the involved lower extremity after ACL injury that did not return to premorbid levels even with ACL reconstruction and rehabilitation. Sites of reduced bone integrity included the proximal and distal femur, proximal tibia, patella, and calcaneus. Bone loss was increased with limited weight bearing and prolonged disuse or immobilization; however, significant improvements were not observed with accelerated rehabilitation. Some studies reported relations between Lysholm, Tegner, International Knee Documentation Committee survey, or function scores and bone integrity, whereas others reported no or poor relations. **CONCLUSIONS:** Involved lower extremity bone integrity is decreased after ACL injury. Current evidence suggests that premorbid bone integrity is not re-established after ACL reconstruction even when accelerated rehabilitation is performed. Recommendations to improve osseous homeostasis and bone health after ACL injury and reconstruction are provided.

Stress fractures: classification and management.

Kaeding CC, Najarian RG. The Physician and sportsmedicine, 2010 38(3):45-54. Sports Medicine Center, Department of Orthopaedics, The Ohio State University, Columbus, OH 43221, USA.

Stress fractures occur as a result of microdamage secondary to repetitive strains. A mechanism for the development of stress fractures involves the accumulation of microdamage, which occurs with multiple subultimate failure loads applied to the bone. Stress fractures may be classified as high or low risk, depending on the grade of the injury. The most common site of injury is the lower extremity. In this article, we review the pathophysiology, etiology, diagnosis, and management of stress fractures, and present treatment guidelines for return to play.

Treatment of osteitis pubis and osteomyelitis of the pubic symphysis in athletes: a systematic review

Haemi Choi, Michael McCartney, Thomas M Best: Br J Sports Med, 45:57-64.

Objectives The authors examined the most current evidence for treatment options in athletes with osteitis pubis and osteomyelitis pubis, attempting to determine which options provide optimal pain relief with rapid return to sport and prevention of symptom reoccurrence.

Methods

Three databases—MEDLINE, Cochrane Database of Systematic Reviews and CINAHL—were searched using the OVID interface for all years between 1985 and May 2008. References were analysed from included studies, and additional relevant articles were obtained for inclusion. Inclusion criteria included (1) humans only, (2) subjects had no apparent risk factors for development of osteitis pubis or osteomyelitis of the pubic symphysis other than athletic involvement, (3) both physical exam findings and diagnostic imaging were used to confirm either diagnosis, and (4) a definitive treatment strategy was identifiable for management of osteitis pubis or osteomyelitis of the pubic symphysis. In total, 25 articles were included in the review.

Results

There were no randomised controlled trials identified with this study's search strategy. A total of 195 athletes were diagnosed as having osteitis pubis (186 males, nine females) and treated with either conservative measures/physical therapy, local injection with corticosteroids and/or local anaesthetic, dextrose prolotherapy, surgery or antibiotic therapy. Six case reports/series described conservative treatment measures (physical therapy, rest, non-steroid anti-inflammatory drugs). Four case series explored the use of corticosteroid injections in treatment. One case series described the use of dextrose prolotherapy as a treatment modality. Six case series described various surgical techniques (pubic symphysis curettage, polypropylene mesh placement and pubic bone stabilisation) in treatment. Ten case reports/series (10 subjects) outlined antibiotic treatment of osteomyelitis of the pubic symphysis.

Conclusions

The current medical literature shows only level 4 evidence of the treatment for osteitis pubis in 24 case reports/series in athletes. Without any direct comparison of treatment modalities, it is difficult to determine which individual treatment option is the most efficacious. Further study comparing the different treatment options is necessary to determine which modality provides the fastest return to sport.

Prevalence of radiological signs of femoroacetabular impingement in patients presenting with long-standing adductor-related groin pain .

A Weir, R J de Vos, M Moen, P Hölmich, J L Tol.: Br J Sports Med, 2011, 45:6-9.

Objective: A decreased range of motion (ROM) of the hip joint is known to predispose to athletic groin injury. Femoroacetabular impingement (FAI) of the hip leads to a reduced ROM. This study examined the prevalence of radiological signs of FAI in patients presenting with long-standing adductor-related groin pain (LSARGP).

Design: Prospective case

series.

Setting:

Outpatient Sports Medicine Department.

Patients

: 34 athletes with LSARGP defined as pain on palpation of the proximal insertion of adductor muscle and a painful, resisted adduction test.

Assessment

:

A clinician blinded to the results of the radiological assessment performed a physical examination: iliopsoas length, hip ROM and anterior hip impingement test. Anteroposterior pelvic radiographs were examined by a second blinded clinician for the presence of: pistol grip deformity, centrum-collum-diaphyseal angle, femoral head neck ratio, coxa profunda, protrusio acetabuli, lateral centre edge angle, acetabular index and cross-over sign.

Results

: The prevalence of radiological signs of FAI was 94% (64/68). The mean number of radiological signs in hips with LSARGP was 1.84 (range 0–4, SD 1.05) and 1.96 (range 0–5, SD 1.12) in asymptomatic groins ($p=0.95$). The anterior hip impingement test was positive in nine cases. There was no relationship with the number of radiological signs ($p=0.95$). There was no correlation between hip ROM and the number of radiological signs ($p=0.37$).

Conclusion

: Radiological signs of FAI are frequently observed in patients presenting with LSARGP.

Clinicians should be aware of this fact and the possible lack of correlation when assessing athletes with groin pain.

Adding a physical exercise programme to brief intervention for low back pain patients did not increase return to work.

Hagen EM, Odelien KH, Ådelien KH, Lie SA, Eriksen HR.: Scandinavian journal of public health, 2010;11 38(7):731-8. Spine Clinic, Sykehuset Innlandet HF, Ottestad, Norway.

AIMS: To investigate if a standardised physical exercise programme given in addition to a brief intervention at a spine clinic had an effect on return to work. **METHODS:** A total of 246 patients sick-listed 8-12 weeks for non-specific low back pain were offered a brief intervention programme at the spine clinic with examination, information, reassurance, and encouragement to engage in physical activity as normal as possible, before they were randomised into an intervention group (n = 124) and a control group (n = 122). Patients in the intervention group participated in a physical exercise programme at the spine clinic. **RESULTS:** During the 2-year follow-up, there were no significant differences between the groups on sick leave, pain, use of analgesics, psychological distress, coping strategies, fear-avoidance beliefs, self-reported disability, or walking distances. However, both groups increased return to work, reported less pain and better function, and reduced fear-avoidance beliefs for physical activity during the follow-up period. Fear-avoidance beliefs for work were not changed. **CONCLUSIONS:** A physical exercise programme for low back pain patients given after a brief intervention at a spine clinic did not have any additional effect on sick leave or fear-avoidance beliefs. Both groups reported less pain, better physical function, and increased return to work during follow-up. The treatment at the spine clinic did not contain a vocational rehabilitation programme directed towards individual work-related problems, which might explain no change in fear-avoidance beliefs for work.

Hamstring strain injuries: are we heading in the right direction? Mendiguchia J, Alentorn-Geli E, Brughelli M

British journal of sports medicine 46(2):81-5, 2012 Acute hamstring injuries are the most prevalent muscle injuries reported in sport. Despite a thorough and concentrated effort to prevent and rehabilitate hamstring injuries, injury occurrence and re-injury rates have not improved over the last three decades. This failure is most likely due to the following: (1) a lack of studies with high level of evidence into the identification and prevention of hamstring injuries and (2) a reductionist approach of the current literature. The objectives of this article are to review and critique the current literature regarding isolated risk factors, and introduce a new concept for a more comprehensive scientific understanding of how multiple risk factors contribute to hamstring strain injury. The authors hope that this new conceptual model can serve as a foundation for future evidence-based research and aid in the development of new prevention methods to decrease the high incidence of this type of injury.

Hamstring muscle injuries in professional football: the correlation of MRI findings with return to play. Ekstrand J, Healy JC, Walden M, Lee JC, English B, Häggglund M

British journal of sports medicine 46(2):112-7, 2012
Background Hamstring injury is the single most common injury in professional football. MRI is commonly used to confirm the diagnosis and provide a prognosis of lay-off time. Objective To evaluate the use of MRI as a prognostic tool for lay-off after hamstring injuries in professional football players and to study the association between MRI findings and injury circumstances. Methods Prospective cohort study where 23 European professional teams, were followed between 2007 and 2011. Team medical staffs recorded individual player exposure and time-loss injuries. Radiological grading was performed using a modified Peetrons classification into four grades where grades 2 and 3 represent fibre disruption. Results In total, 516 hamstring injuries occurred and 58% of these were examined by MRI. Thirteen per cent were grade 0 injuries, 57% grade 1, 27% of grade 2 and 3% of grade 3. Grade 0 and 1 injuries accounted for 56% (2141/3830 days) of the total lay-off. The lay-off time differed between all four radiological grades of injury (8 ± 3 , 17 ± 10 , 22 ± 11 and 73 ± 60 days, $p < 0.001$) was found in 17 (43%) dominant and 23 (58%) non-dominant knees. Professional football players have a significant risk of knee injuries and early osteoarthritis with preponderance in the non-dominant leg.

Early Versus Late Start of Isokinetic Hamstring-Strengthening Exercise After Anterior Cruciate Ligament Reconstruction With Patellar Tendon Graft

[Ufuk Sekir](#) , [Hakan Gur](#) , [Bedrettin Akova](#) , Am J Sports Med, March 2010: 38 492-500. Department of Sports Medicine, Medical School of Uludag University, 16059 Gorukle, Bursa, Turkey

Background Hamstring strengthening after anterior cruciate ligament reconstruction is a vital component of the rehabilitation program. **Purpose:** The objective of this trial was to investigate the effects of hamstring isokinetic training used in the early phase of the rehabilitation program on the stability, strength, symptoms, and functional outcomes of patients throughout 12 months after anterior cruciate ligament surgery.

Study Design:

Randomized controlled clinical trial; Level of evidence, 2.

Methods: Forty-eight men underwent anterior cruciate ligament reconstruction with an ipsilateral bone–patellar tendon–bone autograft. The patients were randomly assigned to perform daily isokinetic hamstring exercises at postoperative 3 weeks (group I) or to perform daily isokinetic hamstring exercises at postoperative 9 weeks (group II). The patients were evaluated monthly for the first 4 months and at the 12th month for postoperative hamstring and quadriceps strength, as well as for knee function via the Cincinnati Knee Rating Scale and International Knee Documentation Committee form.

Results: Hamstring isometric strength at 30° of knee flexion (at the first and second months) and concentric isokinetic strength (at 2, 3, 4, and 12 months) at the angular velocity of 60 deg/s were significantly ($P < 0.05$). Statistically significant differences were found between wheelchair basketball players with trunk control and wheelchair basketball players with trunk control with respect to the duration of their disability, the daily number of transfers made to wheelchair, and Performance Corrected Wheelchair User's Shoulder Pain Index (PC-WUSPI) score (p

Sonoelastography in the evaluation of painful Achilles tendon in amateur athletes.

Sconfienza LM, Silvestri E, Cimmino MA.: Clinical and experimental rheumatology, 2010, 28(3):373-8.

Unità di Radiologia, IRCCS Policlinico San Donato, San Donato Milanese, Italy.

OBJECTIVES: The purpose of our paper was to evaluate by sonoelastography the Achilles tendon of asymptomatic volunteers and of patients referring for chronic overuse-associated pain, also comparing these findings with those obtained with B-mode ultrasound (US).

METHODS: This study had local Ethics Committee approval; all patients gave their written informed consent. Twelve patients (9 men, 3 women, median age 52.5 years, range 38-64 years) referred for unilateral Achilles tendon pain associated with amateur sporting activities and 18 healthy controls (11 men, 7 women, median age 54 years, range 27-64 years) were studied. US/sonoelastography were performed with a Logos EUB8500 system (Hitachi Ltd., Tokyo, Japan) equipped with a 10-6 MHz high-resolution broadband linear array, on 12 symptomatic tendons and 36 controls. The probe was positioned at the calcaneal enthesi, retrocalcaneal bursa, myotendineous junction, and in three different areas of the tendon body. The elastogram colour range was translated to a numeric score and the differences of tendon resilience were compared by the Kruskal-Wallis test. **RESULTS:** On US, symptomatic tendons showed increased tendon thickness (12/12 tendons vs. 8/36 controls, $p=0.75$) intra-rater and inter-rater reliability, while hip external rotation flexibility and hip abduction strength demonstrated acceptable intra-rater but not inter-rater reliability. Hip internal and external rotation strength tests were not found to be reliable. Football players with groin pain had significantly reduced force production on the squeeze test ($p>0.05$). **Conclusion:** Several hip flexibility and strength measures were found to be reliable. Only the squeeze test discriminated between football players with and without groin pain.

The epidemiology of ankle injuries occurring in English Football Association academies

[D J Cloke](#) ¹, [S Spencer](#), [A Hodson](#), [D Deehan](#), Br J Sports Med 2009;43:1119-1125.

Objective: To ascertain the epidemiology of ankle injuries in elite youth football. **Design:** Retrospective analysis of prospectively collected injury data from English Football Association (FA) academies.

Setting:

Forty-one FA football academies, between 1998 and 2006.

Participants:

For the complete seasons studied, a total of 14 776 players was registered from U9 to the U16 age category, a mean of 2463 players per year. All ankle injuries of sufficient severity to miss 48 h or more of training were studied, 2563 injuries in total.

Main Outcome Measure:

The incidence and burden of ankle injuries in this population and factors associated with injury.

Results:

There was a mean incidence of one ankle injury per player per year, and a mean of 20 training days and two matches were missed per ankle injury. Increased injury rates were seen in older players, in competition and later in each half of match time. Peaks in injury were observed early in the season and after the winter break. In competition, more injuries were associated with a contact situation than in training. Eighty-eight injuries (3.4%) required a lay-off of 3 months or more and in 18 (0.7%) cases the player failed to return to training. In total, 52 290 training days and 5182 match appearances were lost through ankle injury. The majority of injuries were sprains, but more severe injuries occurred accounted for 3.9% of the total.

Conclusions:

Ankle injuries are common in young football players and are often severe, with prolonged loss of training time. This has potential far-reaching implications, both on and off the field.

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Upper extremity injuries in golf.

Bayes MC, Wadsworth LT

..:The Physician and Sportsmedicine, 37(1):92-62009. Saint Louis University School of Medicine, Belleville, IL 62220, USA.

Golf is an asymmetric sport with unique patterns of injury depending upon the skill level. Higher handicap players typically experience injuries that result from swing mechanics, whereas lower handicap and professional players have overuse as the major cause of their injuries. The majority of shoulder injuries affecting golfers occur in the nondominant shoulder. Common shoulder injuries include subacromial impingement, rotator cuff pathology, glenohumeral instability, and arthritis involving the acromioclavicular and/or glenohumeral joints. Lead arm elbow pain resulting from lateral epicondylitis (tennis elbow) is the leading upper extremity injury in amateur golfers. Tendon injury is the most common problem seen in the wrist and forearm of the golfer. Rehabilitation emphasizing improvement in core muscle strength is important in the treatment of golf injury. Emerging treatments for tendinopathy include topical nitrates, ultrasound-guided injection of therapeutic substances, and eccentric rehabilitation. There is evidence supporting physiotherapy, and swing modification directed by a teaching professional, for treatment of upper extremity golf injuries. This article focuses on upper extremity injuries in golf, including a discussion of the epidemiology, causes, diagnosis, treatment, and prevention of injuries occurring in the shoulder, elbow, wrist, and hand.

Chin-up-induced bilateral anterior shoulder dislocation: a case report.

Felderman H, Shih R, Maroun V.

The Journal of Emergency Medicine. 37(4):400-2, 2009. Department of Emergency Medicine, Morristown Memorial Hospital, 100 Madison Avenue, Box 8, Morristown, NJ 07962-1965, USA.

Background: Simultaneous bilateral shoulder dislocations are extremely rare occurrences. Objective

: We present an unusual case where the patient suffered simultaneous bilateral anterior shoulder dislocations during chin-up exercises. To our knowledge, this mechanism has not been previously reported.

Case report

: A 44-year-old woman presented to the Emergency Department (ED) complaining of bilateral shoulder pain while doing chin-up exercises. She was completing her workout when she developed severe pain to both of her shoulders with associated parasthesias to both hands and the right forearm. The patient was found to have bilateral anterior shoulder dislocations; both were reduced using procedural sedation and traction-countertraction techniques.

Conclusion

: The mechanics of chin-up exercises places the glenohumeral joint in a position of instability, increasing the likelihood of dislocation.

Arthroscopic repair of L-shaped tear of the anterior band of the inferior glenohumeral ligament complex in a pediatric patient: a technical note.

Nho SJ, Reiff SN, Van Thiel GS, Romeo AA

..: Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA. 17(12):1454-7 , 2009.

Section of Shoulder and Elbow Surgery, Division of Sports Medicine, Department of Orthopedic Surgery, Rush University Medical Center, Rush Medical College of Rush University, 1725 West Harrison Street, Suite 1063, Chicago, IL 60612, USA.

The present study reports on a case of a 10-year-old patient with recurrent right shoulder instability after a traumatic event leading to a mid-substance tear of the anterior band of the inferior glenohumeral ligament complex in an L-shaped pattern. Arthroscopic repair consisting of a 2.4 mm bioabsorbable suture anchor at the apex and a four PDS sutures placed through the capsulolabral junction leads to an anatomic repair with excellent short-term results similar to those found in other studies. The injury pattern is thought to be about 1% of shoulder dislocations, but tear pattern recognition is critical for a successful repair and clinical result.

Rotator cuff tendinopathy.

Lewis JS.

British Journal of Sports Medicine, 43(4):236-41, 2009. La Therapy Department, Chelsea and Westminster NHS Healthcare, 369 Fulham Road, London SW10 9NH, UK.

Purpose: A review was conducted to synthesise the available research literature on the pathogenesis of rotator cuff tendinopathy. **Relevance:** Musculoskeletal disorders of the shoulder are extremely common, with reports of prevalence ranging from one in three people experiencing shoulder pain at some stage of their lives to approximately half the population experiencing at least one episode of shoulder pain annually. Pathology of the soft tissues of the shoulder, including the musculotendinous rotator cuff and subacromial bursa, is a principal cause of pain and suffering.

Concl

usions

: The pathoaetiology of rotator cuff failure is multifactorial and results from a combination of intrinsic, extrinsic and environmental factors. The specialised morphology of the rotator cuff, together with the effects of stress shielding, may contribute to the development of rotator cuff tendinopathy. Profound changes within the subacromial bursa are strongly related to the pathology and resulting symptoms. A considerable body of research is necessary to more fully understand the aetiology and pathohistology of rotator cuff tendinopathy and its relationship with bursal pathology. Once this knowledge exists more effective management will become available.

Rotator cuff tendinopathy/subacromial impingement syndrome: is it time for a new method of assessment?

Lewis JS

. British Journal of Sports Medicine, 43(4):259-64, 2009. Therapy Department, Chelsea and Westminster NHS Healthcare, 369 Fulham Road, London SW10 9NH, UK.

Disorders of the shoulder are extremely common, with reports of prevalence ranging from 30% of people experiencing shoulder pain at some stage of their lives up to 50% of the population experiencing at least one episode of shoulder pain annually. In addition to the high incidence, shoulder dysfunction is often persistent and recurrent, with 54% of sufferers reporting ongoing symptoms after 3 years. To a large extent the substantial morbidity reflects (i) a current lack of understanding of the pathoaetiology, (ii) a lack of diagnostic accuracy in the assessment process, and (iii) inadequacies in current intervention techniques. Pathology of the rotator cuff and subacromial bursa is considered to be the principal cause of pain and symptoms arising from the shoulder. Generally these diagnostic labels relate more to a clinical hypothesis as to the underlying cause of the symptoms than to definitive evidence of the histological basis for the diagnosis or the correlation between structural failure and symptoms. Diagnosing rotator cuff tendinopathy or subacromial impingement syndrome currently involves performing a structured assessment that includes taking the patient's history in conjunction with performing clinical assessment procedures that generally involve tests used to implicate an isolated structure. Based on the response to the clinical tests, a diagnosis of rotator cuff tendinopathy or subacromial impingement syndrome is achieved. The clinical diagnosis is strengthened with the findings from supporting investigations such as blood tests, radiographs, ultrasound, magnetic resonance imaging (MRI), computed axial tomography (CT), radionuclide isotope scan, single photon emission computed tomography, electromyography, nerve conduction and diagnostic analgesic injection. This process eventually results in the formation of a clinical hypothesis, and then, in conjunction with the patient, a management plan is decided upon and implemented. This paper focuses on the dilemmas associated with the current process, and an alternative method for the clinical examination of the shoulder for this group of patients is proposed.

Evaluation of team-doctor actions during football games in Japanese professional football.

Takahashi M, Fukuoka S, Nagano A. Journal of Science and Medicine in Sport / Sports Medicine Australia , 12(6):611-3, 2009.

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There have been many studies on football (soccer) match injuries both in national leagues and international tournaments, including the World Cup. However, no previous study on the number and types of actions taken by a team-doctor during a football season has been investigated. The aim of this study is to investigate what actions and how much a team doctor acts during professional football matches in a typical season of the Japanese professional football league (J-League). Injuries were prospectively recorded by team doctors with a Japanese professional league club during the 2004 season. Data recorded by the attending doctor after each match included information relating to the injury, time of occurrence and actions taken by the doctor in response to the injuries. The activity of the doctor was graded into 6 categories (grade A to F). During the 42 official matches held throughout the 2004 season, a total of 67 doctor-actions were taken. The overall doctor-action frequency rate (DAFR) was 1.6 actions per match. This study demonstrated how the team doctor acts during an average football match, and provides some useful information for team-doctors who attend football matches.

Epidemiology of injuries in competition taekwondo: a meta-analysis of observational studies.

Lystad RP, Pollard H, Graham PL. Journal of science and medicine in sport / Sports Medicine Australia , 12(6):614-21, 2009.

Department of Health and Chiropractic, Macquarie University, Australia.

This paper aims to review and collate the epidemiological data of injuries in competition taekwondo as reported in the literature, make recommendations, and suggest further research. The electronic databases AMED, AusportMed, CINAHL, MEDLINE, PubMed, and SPORTDiscus were searched from inception to March 2008. Fourteen prospective cohort studies reporting the incidence of injuries in taekwondo were included. Two reviewers independently extracted data and assessed trial quality using the STROBE statement. Homogenous studies were combined in a pooled analysis using a Poisson random effects regression model. Poisson regression showed an overall mean injury rate of 79.3 per 1000 athlete-exposures (95% confidence interval 22.8, 275.4). Neither age, gender nor level of play were significant in the analysis. The most common injury location and type were found to be the lower limb and contusion, respectively, and were invariably associated with contact. Although taekwondo players are exposed to a substantial risk of sustaining injuries, the majority of injuries appeared to be of minimal severity. Modifications to the competition rules and protective equipment may be warranted. Future studies should adhere to recommended operational definitions, utilise a standardised injury classification system, and report injury rates using multiple denominators in order to facilitate inter- and cross-sport comparisons.

Posterior dislocation of the sternoclavicular joint and epiphyseal disruption of the medial clavicle with posterior displacement in sports participants.

Laffosse JM, Espié A, Bonneville N, Mansat P, Tricoire JL, Bonneville P, Chiron P, Puget J. : The Journal of bone and joint surgery. British volume, 92(1):103-9, 2010.

Institut Locomoteur, Toulouse, France.

We retrospectively analysed the clinical results of 30 patients with injuries of the sternoclavicular joint at a minimum of 12 months' follow-up. A closed reduction was attempted in 14 cases. It was successful in only five of ten dislocations, and failed in all four epiphyseal disruptions. A total of 25 patients underwent surgical reduction, in 18 cases in conjunction with a stabilisation procedure. At a mean follow-up of 60 months, four patients were lost to follow-up. The functional results in the remainder were satisfactory, and 18 patients were able to resume their usual sports activity at the same level. There was no statistically significant difference between epiphyseal disruption and sternoclavicular dislocation ($p > 0.05$), but the functional scores (Simple Shoulder Test, Disability of Arm, Shoulder, Hand, and Constant scores) were better

when an associated stabilisation procedure had been performed rather than reduction alone ($p = 0.05$, $p = 0.04$ and $p = 0.07$, respectively). We recommend meticulous pre-operative clinical assessment with CT scans. In sternoclavicular dislocation managed within the first 48 hours and with no sign of mediastinal complication, a closed reduction can be attempted, although this was unsuccessful in half of our cases. A control CT scan is mandatory. In all other cases, and particularly if epiphyseal disruption is suspected, we recommend open reduction with a stabilisation procedure by costoclavicular cerclage or tenodesis. The use of a Kirschner wire should be avoided.

Injury patterns in Division I collegiate swimming.

Wolf BR, Ebinger AE, Lawler MP, Britton CL.: The American journal of sports medicine, 37(10):2037-42, 2009.

Department of Orthopaedic Surgery, University of Iowa Hospital and Clinics, USA.

Background: In the last 25 years, it is estimated that over 42,000 male and female swimmers have competed at the National Collegiate Athletic Association (NCAA) Division I-A level.

Despite the magnitude of these numbers, little is known about the epidemiology of collegiate swimming injuries.

Purpose: To describe the pattern of injuries incurred for one NCAA Division I collegiate men's and women's swimming team over 5 seasons.

Study design

: Descriptive epidemiology study.

Methods

: Musculoskeletal and head injuries reported in the Sports Injury Management System for a Division I swimming team from 2002-2007 were identified. Gender, body part, year of eligibility, position, stroke specialty, scholarship status, and team activity during which the injury occurred and lost time were recorded. Risk of injury was assessed relative to gender, stroke specialty, and year of eligibility.

Results

: From 2002-2007, 44 male and 50 female athletes competed for the University of Iowa swimming and diving team. The overall injury rates were estimated as 4.00 injuries per 1000

exposures for men and 3.78 injuries per 1000 exposures for women. Thirty-seven percent of injuries resulted in missed time. The shoulder/upper arm was the most frequently injured body part followed by the neck/back. Freshman swimmers suffered the most injuries as well as the highest mean number of injuries per swimmer. A significant pattern of fewer injuries in later years of eligibility was also demonstrated. The relative risk (RR) for injury was higher among nonfreestyle stroke specialties (RR, 1.33 [1.00-1.77]). Injury most often occurred as a result of, or during, practice for all swimmers. However, 38% of injuries were the result of team activities outside of practice or competition, such as strength training. No significant relationship was found between occurrence of injury and gender or scholarship status. There was no significant relationship between body part injured and stroke specialty. An increased number of total injuries and an increased risk of injuries in freshman collegiate swimmers were found.

Conclusion

: Particular attention should be given to swimmers making the transition into collegiate level swimming. These data also suggest that injury surveillance and potential prevention strategies should focus on the shoulder for in-pool activities and the axial spine for cross-training activities.

Dorsiflexion deficit during jogging with chronic ankle instability.

Drewes LK, McKeon PO, Kerrigan DC, Hertel J

Journal of science and medicine in sport / Sports Medicine Australia, 12(6):685-7, 2009.

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The purpose of the study was to determine whether individuals with chronic ankle instability (CAI) demonstrate altered dorsiflexion/plantar flexion range of motion (ROM) compared to controls during jogging. The case control study took place in a university motion analysis laboratory. Fourteen volunteers participated in the study, seven suffered from CAI (age 25 \pm 4.2 years, height 173 \pm 9.4 cm, mass 71 \pm 8.1kg) and seven were healthy, matched controls (age 25 \pm 4.5 years, height 168 \pm 5.9 cm, mass 67 \pm 9.8kg). All subjects jogged on an instrumented treadmill while a ten-camera motion analysis system collected three-dimensional kinematics of

the lower extremities. The main outcome measure was sagittal plane (dorsiflexion/plantar flexion) range of motion of the ankle throughout the gait cycle. CAI subjects had significantly less dorsiflexion compared to the control group from 9% to 25% during jogging (4.83 ± 0.55 degrees). CAI subjects demonstrated limited ankle dorsiflexion ROM during the time of maximal dorsiflexion during jogging. Limited dorsiflexion ROM during gait among individuals with CAI may be a risk factor for recurrent ankle sprains. These deficits should be treated appropriately by rehabilitation clinicians.

Evidence-based treatment of hamstring tears.

Copland ST, Tipton JS, Fields KB.: Current Sports Medicine Reports, 8(6):308-14, 2009.

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Hamstring tears are exceedingly common in a variety of athletic populations and contribute to a significant amount of morbidity and time lost from sport. Many modifiable and non-modifiable risk factors have been identified with hamstring injury. There is strong evidence that Nordic hamstring exercises can decrease the risk of hamstring injury, limited evidence that sports specific anaerobic interval training and isokinetic strengthening can reduce injury rates, and limited evidence that daily static stretching after injury can increase recovery rate. The majority of medical, surgical, and rehabilitative intervention studies have limitations based on the total number of hamstring injuries included in a given study, reliance on retrospective cohort studies, and conclusions based on case series that limit the utility of the information. Most do not provide a level of evidence greater than expert opinion.

Chronic lumbar paraspinal compartment syndrome: a case report and review of the literature.

Xu YM, Bai YH, Li QT, Yu H, Cao ML

The Journal of bone and joint surgery. British volume: (12):1628-30, 2009.

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A 25-year-old male weightlifter felt increasing intractable low back pain during training but denied any acute injury. The physical examination, blood parameters, radiographs and MRI were unremarkable. He had been treated non-operatively by various means, with only temporary relief. The pressures in the lumbar paraspinal compartment were abnormally high and he was treated by surgical decompression. This gave rapid relief, he returned to training, and one year later the pain had not recurred.

Case reports: a Stener-like lesion of the medial collateral ligament of the knee.

Corten K, Hoser C, Fink C, Bellemans J.: Clinical orthopaedics and related research , (1):289-93, 2009.

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When the superficial fibers of the medial collateral ligament of the knee are torn without tearing of the deep fibers, the anterior superficial fibers may displace over the pes anserinus tendons,

so that healing back to the tibial insertion site may be jeopardized. As only the anterior superficial and not the posterior superficial or deep fibers are disrupted, the knee will not have increased valgus laxity in extension whereas there is not a firm end point in 30 degrees flexion. The clinical findings could be confused with those of a Grade 2 medial collateral ligament sprain that generally is not associated with displacement of the anterior fibers over the pes anserinus tendons. We describe the diagnostic findings confirmed with surgical exploration of two Stener-like disruptions of the medial collateral ligament of the knee.

Sports injuries during the Summer Olympic Games 2008.

Junge A, Engebretsen L, Mountjoy ML, Alonso JM, Renström PA, Aubry MJ, Dvorak J

..: The American Journal of Sports Medicine. 37(11):2165-72, 2009.

Background: Standardized assessment of sports injuries provides important epidemiological information and also directions for injury prevention. Purpose: To analyze the frequency, characteristics, and causes of injuries incurred during the Summer Olympic Games 2008. STUDY DESIGN: Descriptive epidemiology study.

Methods

: The chief physicians and/or chief medical officers of the national teams were asked to report daily all injuries newly incurred during the Olympic Games on a standardized injury report form. In addition, injuries were reported daily by the physicians at the medical stations at the different Olympic venues and at the polyclinic in the Olympic Village.

Results

: Physicians and/or therapists of 92 national teams covering 88% of the 10,977 registered athletes took part in the study. In total, 1055 injuries were reported, resulting in an incidence of

96.1 injuries per 1000 registered athletes. Half of the injuries (49.6%) were expected to prevent the athlete from participating in competition or training. The most prevalent diagnoses were ankle sprains and thigh strains. The majority (72.5%) of injuries were incurred in competition. One third of the injuries were caused by contact with another athlete, followed by overuse (22%) and noncontact incidences (20%). Injuries were reported from all sports, but their incidence and characteristics varied substantially. In relation to the number of registered athletes, the risk of incurring an injury was highest in soccer, taekwondo, hockey, handball, weightlifting, and boxing (all $\geq 15\%$ of the athletes) and lowest for sailing, canoeing/kayaking, rowing, synchronized swimming, diving, fencing, and swimming.

Conclusion

: The data indicate that the injury surveillance system covered almost all of the participating athletes, and the results highlight areas of high risk for sport injury such as the in-competition period, the ankle and thigh, and specific sports. The identification of these factors should stimulate future research and subsequent policy change to prevent injury in elite athletes.

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Sports after surgical treatment of a herniated lumbar disc: a prospective observational study

Weber J, Schönfeld C, Spring A.: Zeitschrift für Orthopädie und Unfallchirurgie, 147(5):588-92, 2009.

Gesellschaft für MikroNeuroChirurgie mbH, Wirbelsäulenlinik Gensingen.

Lumbar discectomy is the most frequent spinal surgical procedure in Germany. Surgeons vary widely in their preferences with regard to patients' return to sports after spinal surgery. The self-reported sporting activity before and after microdiscectomy was evaluated in a prospective observational study with 5 year follow-up. Method: One hundred and five patients (mean age 45.4 years) with self-reported sporting activity before lumbar single-level discectomy were re-evaluated after 5 years. The clinical outcome was graded using a modified Prolo scale (pain and medication).

Results: Based on the Prolo scale, an excellent (n = 80) or good (n = 17) outcome was achieved in 92.4% of patients. Altogether, 91.4% of patients (n = 96) resumed sporting activities: 87 patients returned to their previous sport. Only 8.6% of the patients (n = 9) were unable to return to sports, for various reasons (e.g., poor general health, lumbar pain, or lack of time). The mean time until return to sports after operation was 5.8 months (range 6 weeks to 24 months). The recurrence rate was 5.7% (n = 6), with 3 of the herniations occurring before the return to sporting activities (after 1, 2 and 7 months).

Conclusions

: The success rate of single-level microdiscectomy in athletes was frequently good or excellent, with over 90% of patients able to return to sports. The reherniation rate after postoperative athletic activity was comparable with results reported in the literature.

Golf after total knee arthroplasty: do patients return to walking the course?

Jackson JD, Smith J, Shah JP, Wisniewski SJ, Dahm DL.

The American Journal of Sports Medicine, 37(11):2201-4, 2009.

Department of Orthopedic Surgery, Mayo Clinic, Rochester, MN 55905, USA.

Background: Golf provides an opportunity for relatively low-impact exercise for nearly all age groups and is considered a recommended activity for patients after total knee arthroplasty.

Hypothesis

: We hypothesized that total knee arthroplasty would afford patients increased ability to participate in and enjoy golf, allowing a large percentage of these patients to walk the golf course.

Study design

: Case series; Level of evidence, 4.

Methods

: Surveys were sent to 151 golfers who had undergone primary total knee arthroplasty from 1995 to 2000. The detailed survey included 33 questions specific to the patients' golf performance, enjoyment of golf, frequency of participation, timing of return to play, presence of pain, use of a cart, and related golf-specific issues.

Results

: We received and evaluated 93 responses (62%). Fifty-seven percent reported they had returned to golf within 6 months after total knee arthroplasty. Eighty-one percent of respondents reported golfing as frequently, or more frequently, than before knee replacement. Notably, golfers reported less pain while golfing after total knee arthroplasty than before (13% vs 83%; P Conclusion

: In this population of golfers, total knee arthroplasty reliably relieved pain that had been previously experienced while golfing, and increased or maintained this group's enjoyment of playing golf. However, 86% of these patients reported using a cart while golfing. Further patient

education is needed regarding the potential health benefits of walking during golf after total knee arthroplasty.

Chronic exertional compartment syndrome of the forearm in motocross racers: findings on MRI.

Gielen JL, Peersman B, Peersman G, Roelant E, Van Dyck P, Vanhoenacker F, Roeykens J.: Skeletal radiology, 38(12):1153-61, 2009.

Department of Radiology, Antwerp University Hospital, Antwerp, Belgium.

Introduction: The purpose of this prospective study was to demonstrate the findings of MRI in motocross racers with chronic exertional compartment syndrome (CECS) of the forearm.

Materials and Methods:

Racers with proven CECS and without CECS and male individuals not involved in strenuous activities with the forearm were included. Signal intensity (SI) and signal-to-noise ratio (SNR) obtained before and after exercise were compared (D-SNR).

Results

: Magnetic resonance imaging after exercise showed an increase in SI and SNR in the muscles on T2-WI. The SI increase was obvious in the flexor digitorum superficialis (FDS) and profundus (FDP) in all CECS patients. In addition, a minor SI and SNR increase in the extensor carpi radialis longus (ECRL) was noted. In the non-symptomatic group of motocross racers, there was only a minor increase in SI and the SNR, which was similar in the FDP and ECRL muscles. In the untrained individuals a remarkable increase in the SI and SNR of the FDS/FDP-ECRL was noted. This increased SI and SNR was not present in the majority of non-symptomatic racers.

Conclusion

: Post-exertional MRI produces significant findings in CECS of the forearm. The motocross racers without post-exertional oedema in the FDP/FDS had no CECS.

Effect of anterior cruciate ligament reconstruction and meniscectomy on length of career in National Football League athletes: a case control study.

Brophy RH, Gill CS, Lyman S, Barnes RP, Rodeo SA, Warren RF.: The American Journal of Sports Medicine , 37(11): 2102-7, 2009.

Washington University School of Medicine, St Louis, Missouri, USA.

Background: Meniscal and anterior cruciate ligament (ACL) injuries are common in college football athletes. The effect of meniscectomy and/or ACL surgery on the length of an athlete's career in the National Football League (NFL) has not been well examined. **Hypothesis:**

Athletes with a history of meniscectomy or ACL surgery before the NFL combine have a shorter career than matched controls.

Study design

: Case-control study; Level of evidence, 3.

Methods

: A database containing the injury history and career NFL statistics of athletes from 1987-2000 was used to match athletes with a history of meniscectomy and/or ACL surgery, and no other surgery or major injury, to controls without previous surgeries. Athletes were matched by position, year drafted, round drafted, and additional injury history.

Results

: Fifty-four athletes with a history of meniscectomy, 29 with a history of ACL reconstruction, and 11 with a history of both were identified and matched with controls. Isolated meniscectomy reduced the length of career in years (5.6 vs 7.0; $P = .03$) and games played (62 vs 85; $P = .02$). Isolated ACL surgery did not significantly reduce the length of career in years or games played. Comparing the athletes with meniscectomy or ACL reconstruction to athletes with combined ACL reconstruction and meniscectomy, a history of both surgeries, resulted in a shorter career in games started (7.9 vs 35.1; P