


Treatment of groin injuries in athletes

Systematic review (72 Studies) of groin pain in athletes

25% conservative treatment and 75% on surgical treatment

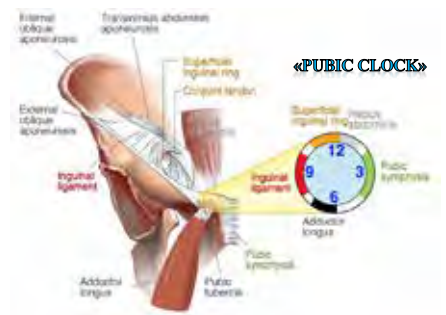


DOHA CONSENSUS
Adam Wick et al. Br. J. Sports Med. 2015;49:768-774
Copyright © BMJ Publishing Group Ltd. & Swiss Association of Sport and Exercise Medicine. All rights reserved.

BJSM

Treatment of groin injuries in athletes

33 different diagnostic terms were used, often with different interpretations for the same term between studies.



DOHA CONSENSUS
Adam Wick et al. Br. J. Sports Med. 2015;49:768-774
Copyright © BMJ Publishing Group Ltd. & Swiss Association of Sport and Exercise Medicine. All rights reserved.

BJSM

Treatment of groin injuries in athletes

A significant association was found with methodologically weaker studies reporting higher treatment success percentages



DOHA CONSENSUS
Adam Weir et al. Br J Sports Med 2016;49:768-774
Copyright © BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. All rights reserved.

BJSM

Conservative vs operative Treatment in athletic pubalgia (AP)

A prospective, randomized study (n 30) with symptoms > 6 months.

Nonsurgical:

- Seven athletes in the nonsurgical group failed
- 50% returned to sport at 1-year follow-up.


surgical group:

- 29 of 30 athletes returned to full sports and were pain free at 1-year
- Pain and satisfaction scores were better in the surgical group at all points up to 1 year out from surgery.

Osama Elattar et al. Sports Health 2016 Jul; 8(4): 313-323. Published online 2016 Jun 14
Groin Injuries (Athletic Pubalgia) and Return to Play

Pajunen H, Birck T, Hämäläinen H, Aho T. Laparoscopic surgery for chronic groin pain in athletes is more effective than conservative treatment: a randomized clinical trial with magnetic resonance imaging of 60 patients with sportsman's hernia (athletic pubalgia). Surgery. 2011;150:99-107. [PubMed](#)

ALTIUS SWISS SPORTMED CENTER




SURGERY


Athletic groin pain: a systematic review of surgical treatment

73 articles with data from 4655 patients


- Athletic groin pain requiring surgery remains a diagnostic and therapeutic challenge
- Intra-articular and extra-articular causes of groin pain in athletes requiring surgery were equal
- The top five causes for pain requiring surgery.

Br J Sports Med 2016 Oct;50(19):1181-6. doi: 10.1136/bjsports-2015-095137. Epub 2016 May 6.
de Sa D¹, Holmich P², Phillips M³, Heaven S⁴, Simunovic N⁵, Phillipson M⁶, Aveni O⁷.

ALTIUS SWISS SPORTMED CENTER



CLASSIFICATION



- Athletic-related groin pain
- Extrinsic-related groin pain
- Intrinsic-related groin pain
- Patellar-related groin pain

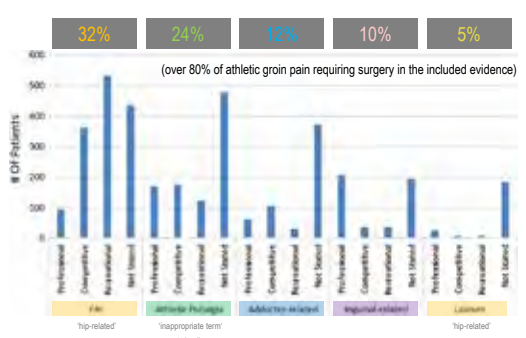
★ Hip-related

BJSM

Adam Weir et al. Br J Sports Med 2016;49:768-774
Copyright © BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. All rights reserved.

Athletic level associations with top five surgical causes of athlete groin pain.

(over 80% of athletic groin pain requiring surgery in the included evidence)



Surgical Cause	Percentage
Ham	32%
Athletic Pubalgia	24%
Abductor-related	12%
Inguinal-related	10%
Lumbar	5%

Legend: Hip-related (yellow), 'Inappropriate term' (green), Mixed (blue), Hip-related (purple), Lumbar (grey)

Darren de Sa et al. Br J Sports Med 2016;50:1181-1186
Copyright © BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. All rights reserved.

BJSM

Surgical Treatment

Hip arthroscopy for FAI was performed in 97% (1466/1510) of patients, and was also utilised exclusively for any labral pathology.

Athletic pubalgia was treated with open surgical procedures 70% of the time (786/1122), with 61% (482/786) of those procedures using mesh reinforcement.

The majority (70% or 403/570) of **adductor-related pathology** was surgically treated with complete adductor tenotomy, and less than 1% of patients were treated with adductor reattachment procedures.

Overall, 36% (169/473) of all **inguinal pathology** was treated with open hernia repair and 39% (183/473) with laparoscopic hernia repair

Darren de SA et al. Br J Sports Med 2016;50:1181-1186

ALTIUS SWISS SPORTMED CENTER

GROIN PAIN IN ATHLETES

HIP RELATED

Adnan Nadeem et al. Br J Sports Med 2016;50:768-774. Copyright BMJ Publishing Group Ltd British Association of Sport and Exercise Medicine. All rights reserved.

BJSM

FEMORO-ACETABULAR IMPINGEMENT (FAI)

Femoro-acetabular Impingement (FAI) = Painfull Impingement of the Femur head / Acetabulum

ALTIUS SWISS SPORTMED CENTER

ALTIUS SWISS SPORTMED CENTER

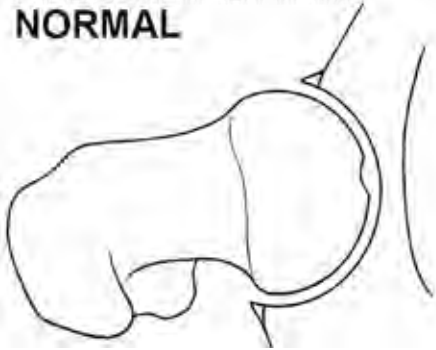
FEMORO-ACETABULAR IMPINGEMENT

ALTIUS SWISS SPORTMED CENTER

FEMORO-ACETABULAR IMPINGEMENT

ALTIUS SWISS SPORTMED CENTER

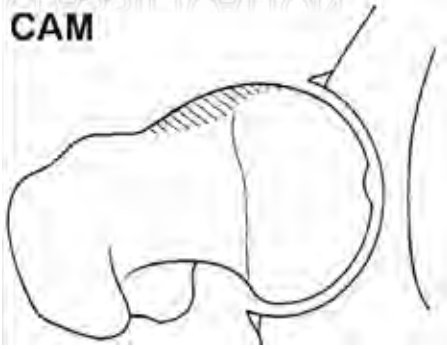
CLASSIFICATION
NORMAL



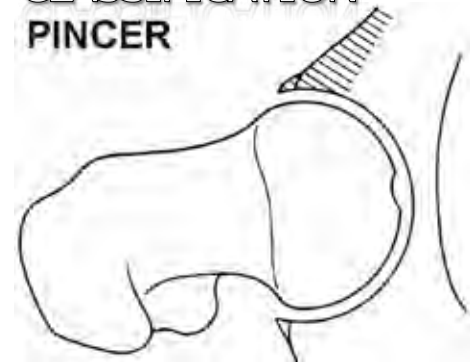
CLASSIFICATION
LABRUM



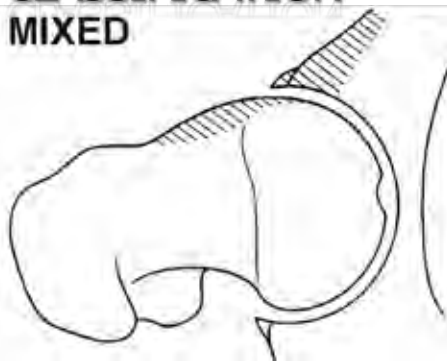
CLASSIFICATION
CAM



CLASSIFICATION
PINCER



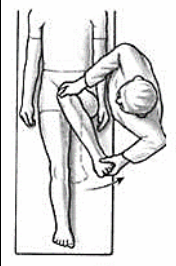
CLASSIFICATION
MIXED



CLINICS



Hip Impingement Test




Flexion / Adduction / Internal Rotation

- Sensitivity ~ 75% intraart. Problems
- Specificity 43% for Labrumlesions

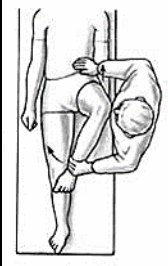
Austin et al

Goal: «typical» Pain

FADIR TEST

ALTIUS SWISS SPORTMED CENTER 

Hip Impingement Test




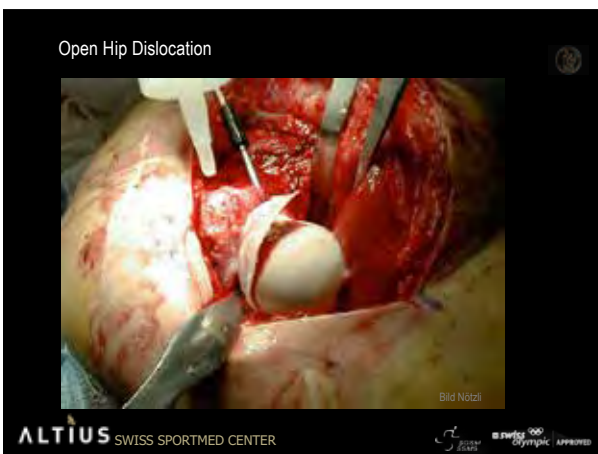
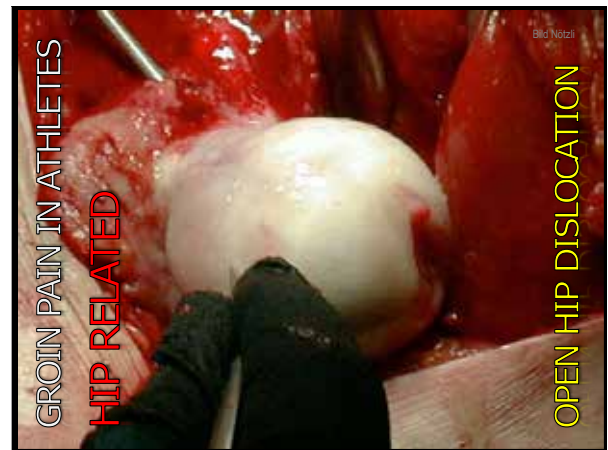
Flexion / Abduction / External Rotation

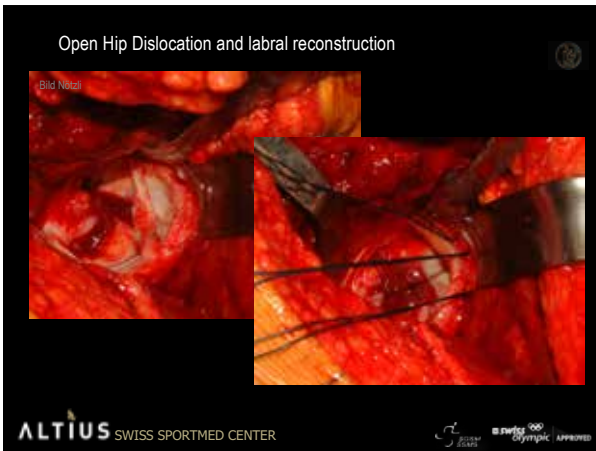
- Sensitivity ~ 88% intraart. Problems

Martin et al

FABER TEST

ALTIUS SWISS SPORTMED CENTER 





Return to sports after FAI surgery in athletes

A new systematic review identified (977 athletes)

- 738 (76%) undergoing arthroscopy
- 180 (18%) open surgery
- 59 (6%) using a mini-direct anterior approach

87% of the athletes RTS with 82% attaining the preinjury level

All studies Level of Evidence IV, the outcomes should be interpreted with caution, not always maintained with longer term follow-up

Adam Weir et al. Br J Sports Med 2015;49:760-774.1
Wall PD Brown et al. Cochrane Database Syst Rev 2014.2
Casarilli N et al. systematic review Br J Sports Med 2015;49:219-24. 1

ALTIUS SWISS SPORTMED CENTER

zurigo Olympic APPROVED

Arthroscopic vs open (surgical dislocation) FAI Surgery

A systematic review and meta-analysis

Hip arthroscopy

- higher nonarthrotic Hip score (NAHS) than open (All other clinical Scores no difference)
- lower reoperation rates than open
- less improvement in alpha angle in patients with cam osteoplasty, than open surgical dislocation.

Zhang D et al. Medicine (Baltimore). 2016 Oct;95(41):e5122.
Hip arthroscopy versus open surgical dislocation for FAI: A systematic review and meta-analysis.

ALTIUS SWISS SPORTMED CENTER

zurigo Olympic APPROVED

Femoroacetabular Impingement FAI



If you have a new hammer - everything looks like a nail !

ALTIUS SWISS SPORTMED CENTER



Case Groin Pain - Badminton † 23 J

Anamnese:


- Top 50 Badminton Worldranking
- Rez ISG Blockaden
- Adduktorenzerrungen
- LWS Myogelosen
- Knie: ITFS
- Hüftschmerzen
- Ueberlastung OSG bds
 - St.n OSG Sup. Trauma re
 - Peronealsehntendinitis li



ALTIUS SWISS SPORTMED CENTER

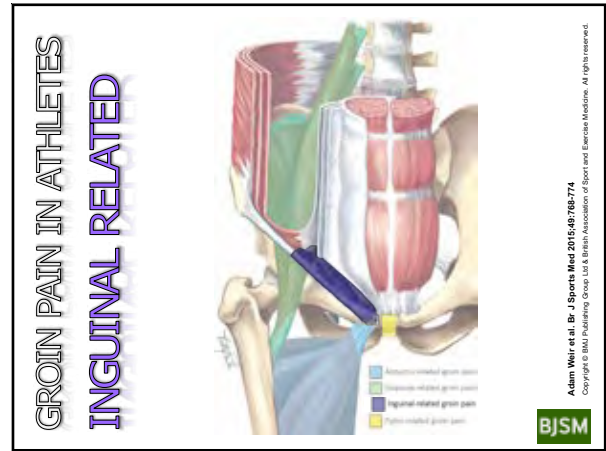
Case, † 23 J

- Klinik:
 - OSG Instabilität re, OSG Laxität li
 - ISG Hypermobilität
 - Adduktorenmyogelose
 - LWS: paravert. Hartspann
 - Pos. Impingement Test Hüfte bds



ALTIUS SWISS SPORTMED CENTER





Inguinal related - Pathology

Imbalance between the hip adductors and the abdominal muscles and /or other shear force acting across the hemipelvis

- resulting in relative muscular overload with "tearing" of the transversalis fascia and/or overlying musculature
- **Disrupted rectus abdominis tendon attachment to the pubis and a weakened posterior inguinal wall.**

Osama Elattar et al., *Sports Health*, 2016 Jul; 8(4): 313-323. Published online 2016 Jun 14
Groin Injuries (Athletic Pubalgia) and Return to Play

ALTIUS SWISS SPORTMED CENTER

Inguinal related - Pathology

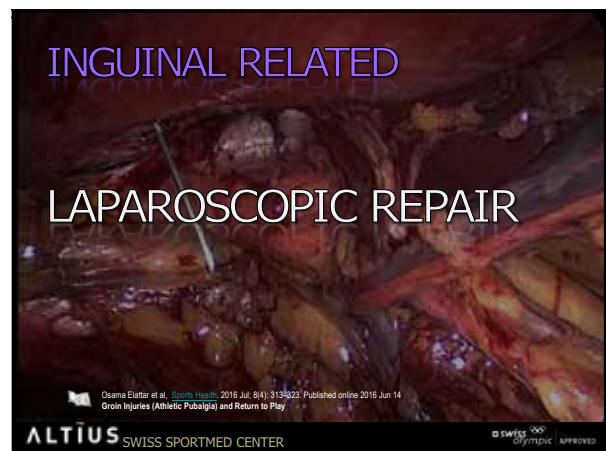
- Weakness of the posterior Wall (Inguinal tunnel)
- Dilatation of transversalis fascia
- In sports due to abdominal muscle activity (pressure↑), transversalis fascia is pushing forward
- Compression of ramus genitalis N. genitofemoralis

ALTIUS SWISS SPORTMED CENTER

Inguinal related - Pathology


- Burning pain to the pubic bone, adductor region and scrotum, sometimes even to the back
- Rectus abdominis retracted cranial and medial
- More tension of the rectus abd. On the os pubis
- «Pubalgia»

ALTIUS SWISS SPORTMED CENTER



Treatment of groin injuries in athletes

there is moderate evidence that, for athletes with inguinal-related groin pain, laparoscopic hernia repair results in lower pain and a higher percentage returning to play than conservative treatment.

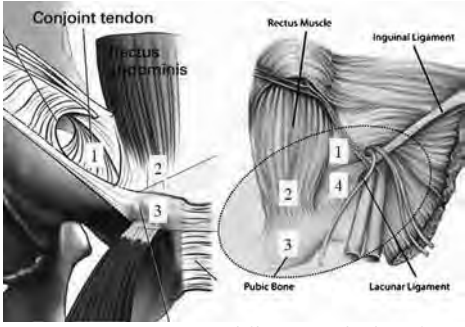


Systematic review (72 Studies) of groin pain in athletes

Hannu Paajanen et al. Br J Sports Med 2015;49:814-818
 doi:10.1136/bjsports-2015-028117
 Copyright © BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. All rights reserved.

BJSM

Systematic review: laparoscopic treatment ... groin pain in athletes



Anterior (left) and posterior (right) view of the groin area.

Hannu Paajanen et al. Br J Sports Med 2015;49:814-818

transabdominal pre-peritoneal and total extraperitoneal procedures the mesh is placed in the pre-peritoneal retroperic space (broken oval line) and it covers most of the inguinal groin areas, that is, (1) posterior wall of the inguinal canal, (2) pubic insertion of rectus abdominis muscle, (3) the pericent of pubic symphysis and insertion of adductors, and (4) insertion of inguinal and lacunar ligaments.

Copyright © BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. All rights reserved.

BJSM

Systematic review: laparoscopic treatment of long-standing groin pain in athletes

Conclusions

- Laparoscopic surgery for elite athlete groin pain is increasingly becoming more common with almost 1000 patients reported since 1997.
- Laparoscopic or endoscopic surgery is mini-invasive for athletes, allowing quick return to sporting activity (success rate >90%).
- The median return to sporting activity of 4 weeks (28 days)

There are only a few randomised controlled trials (RCTs), with no single surgical technique demonstrating superiority in a comparative analysis

Complication rate approx. 2.8 %

Hannu Paajanen et al. Br J Sports Med 2015;49:814-818
 Krüger J. et al. Sportarztzeitung 4 | 2017

Copyright © BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. All rights reserved.

BJSM

LAPAROSCOPIC REPAIR

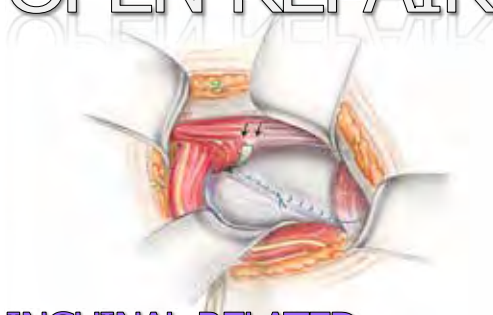
more rapid recovery and return to sport than open

- A laparoscopic mesh repair for posterior wall deficiencies in 35 professional soccer players resulted in **97% returning to play at 10 d**
- A laparoscopic repair in 131 professional athletes with a mean follow-up of 5 years had **97% resuming full sporting activities by 2 to 3 weeks**.
- 54 athletes treated by laparoscopic extraperitoneal inguinal hernia repair with synthetic mesh combined with ipsilateral adductor longus tenotomy returned to full sports-related activity in **24 days**

Osama Elattar et al. Sports Health 2016 Jul; 8(4): 313-323. Published online 2016 Jun 14
 Groin Injuries (Athletic Pubalgia) and Return to Play



OPEN REPAIR

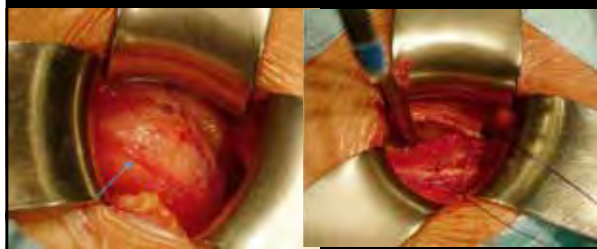


INGUINAL RELATED

Minimal Repair technique of sportsmen's groin: an innovative approach to treat chronic inguinal pain
 Krüger J. et al. Sportarztzeitung 4 | 2017
 doi:10.1007/s10250-016-0614-y

Copyright © BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. All rights reserved.

Open repair of a posterior wall deficiency



Krüger J. et al. Sportarztzeitung 4 | 2017

ALTIUS SWISS SPORTMED CENTER

Swiss Olympic APPROVED

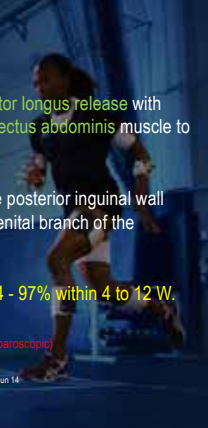
Open repair of a posterior wall deficiency

- "Pelvic floor repair" with or without adductor longus release with reattaching the inferolateral edge of the rectus abdominis muscle to the pubic bone.
- open Bassini hernial repair
- A "minimal repair" technique, repair of the posterior inguinal wall deficiency and a decompression of the genital branch of the genitofemoral nerve


Return-to-sport rate with open repair was 84 - 97% within 4 to 12 W.

Complication rate approx. 0.7 % (4x less than laparoscopic)

Osama Elstner et al. J Sports Med 2016 Jun 6(4): 315-323. Published online 2016 Jun 14. Groin Injuries (Athletic Pubalgia) and Return to Play



GROIN PAIN IN ATHLETES ADDUCTOR RELATED



Adnan Nisar et al. Br J Sports Med 2016;40:768-774. Copyright BMJ Publishing Group Ltd. British Association of Sport and Exercise Medicine. All rights reserved.

BJSM

Treatment of groin injuries in athletes

There is moderate evidence for adductor-related groin pain: Partial release of the adductor longus tendon is effective for return to sport over time.



TJ Gill et al. Arthroscopy Techniques 2014. Adam Nisar et al. Br J Sports Med 2016;40:768-774. Copyright BMJ Publishing Group Ltd. British Association of Sport and Exercise Medicine. All rights reserved.

Systematic review (72 Studies) of groin pain in athletes

BJSM

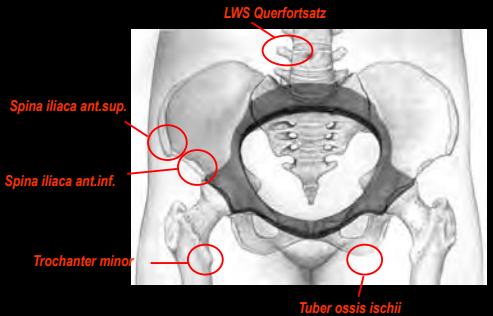
GROIN PAIN IN ATHLETES OTHER CAUSES



ALTIUS SWISS SPORTMED CENTER

ESSENTIAL SPORTS MEDICINE APPROVED

APOPHYSIS LESIONS



ALTIUS SWISS SPORTMED CENTER

ESSENTIAL SPORTS MEDICINE APPROVED

Apophysis lesions

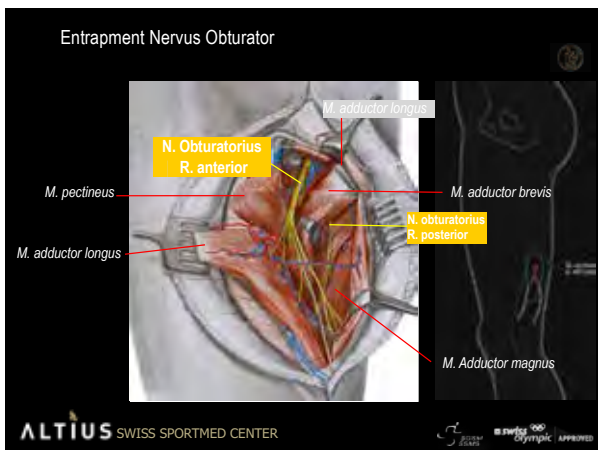
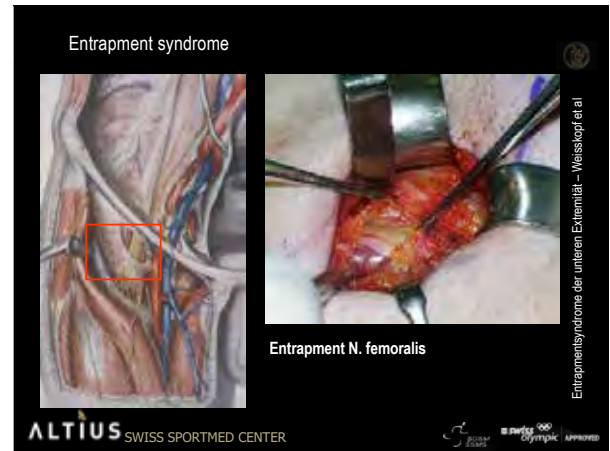
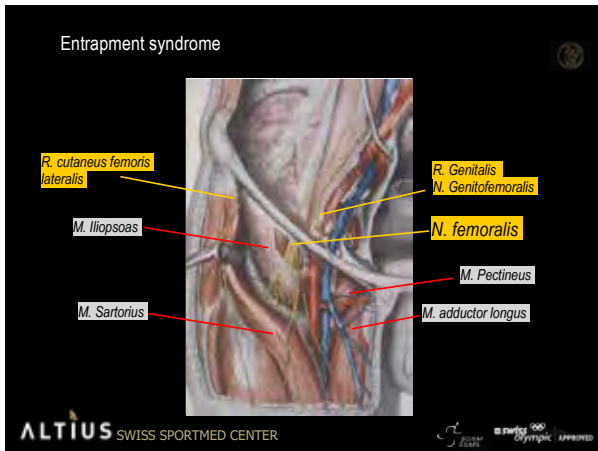
Spina iliaca anterior inferior (Sprinters fracture)



ALTIUS SWISS SPORTMED CENTER

ESSENTIAL SPORTS MEDICINE APPROVED

Bilder: B. Sogasser



Case Groin Pain - Tennis Kasusistik Segesser

E.A., 51 jährig, Hobby-Tennispieler

Anamnese

- Unfall : Ausrutschen mit forciertem Spreizschritt seitwärts

Symptome:

- Leistenschmerz links
- verspannte Adduktoren
- Schmerzen beim Niessen
- Sitzen und Sport nicht mehr möglich



ALTIUS SWISS SPORTMED CENTER swiss olympic APPROVED

Case Groin Pain - Tennis Kasusistik Segesser

E.A., 51 jährig, Hobby-Tennispieler

Röntgen Becken

- Unauffällig
- MRI unauffällig

Diagnose

- Adduktorenzerrung

Therapie

- Physiotherapie



ALTIUS SWISS SPORTMED CENTER swiss olympic APPROVED

Case Groin Pain - Tennis Kasusistik Segesser

E.A., 51 jährig, Tennis Hobby

Verlauf

1. Muskelzerrung Adduktoren - therapieresistent
2. Leistenhernie mit Operation „Weiche Leiste“
3. Neurom N. genitofemoralis nach Leistenoperation - Revisions-OP (Hydrocele)
4. Coxarthrose - TP Operation, gleicher Sz
5. Psychopathologie

5 Ärzte, 5 Diagnosen, Dauer 5 Jahre



Bisherige Kosten des Fehltritts beim Tennis:
Lohnkosten 200'000.-
Therapiekosten 60'000.-
Diagnosekosten: 20'000.-

ALTIUS SWISS SPORTMED CENTER swiss olympic APPROVED

Case Groin Pain - Tennis Kasusistik Segesser

E.A., 51 jährig, Tennis Hobby

Verlauf

1. Muskelzerrung Adduktoren - therapieresistent
2. Leistenhernie mit Operation „Weiche Leiste“
3. Neurom N. genitofemoralis nach Leistenoperation - Revisions-OP (Hydrocele)
4. Coxarthrose - TP Operation, gleicher Sz
5. Psychopathologie
6. Entrapment N. Obturator

6 Ärzte, 6 Diagnosen



Diagnostik:
Nervenblock (Kosten 182.30)
Therapie: operative Neurolyse
Physiotherapie, postop.
beschwerdefrei, Sitzen wieder möglich
Kosten SFr. 5'500.-

ALTIUS SWISS SPORTMED CENTER swiss olympic APPROVED



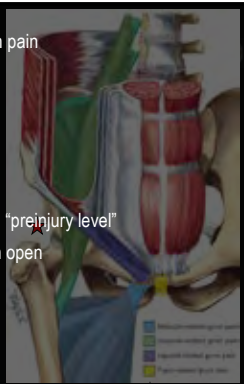
Take home message

© Weir

Summary – Operative Therapy in groin pain

Hip related

- FAI is a risk for Osteoarthritis
- Surgery must be discussed early
- 87% athletes Return to sports, 82% "preinjury level"
- Arthroscopy less re-operations than open

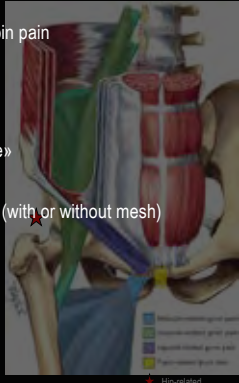


ALTIUS SWISS SPORTMED CENTER swiss olympic APPROVED

Summary II – Operative Therapy in groin pain

Inguinal related

- «Surgery is better than conservative»
- Open or laparoscopic
- Reconstruction of the posterior wall (with or without mesh)
- RTS > 90% in about 4 weeks



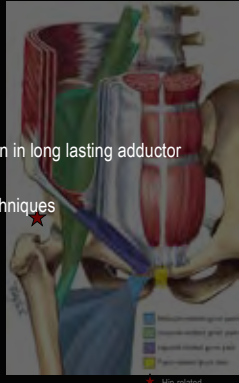
ALTIUS SWISS SPORTMED CENTER

swiss olympic APPROVED

Zusammenfassung III

Adductor related

- Adductor longus release is an option in long lasting adductor problems
- Combination with other surgical techniques



ALTIUS SWISS SPORTMED CENTER

swiss olympic APPROVED

GROIN PAIN IN SPORTS



ALTIUS SWISS SPORTMED CENTER

swiss olympic APPROVED

SEHNENZENTRUM SCHWEIZ SZS, RHEINFELDEN ©

ALTIUS
SWISS SPORTMED CENTER



lukas.weisskopf@altius.ag

www.altius.ag

swiss olympic APPROVED

Diagnosis

Almost 90% of the physical examination techniques performed to diagnose surgical groin pain in the athlete comprised two manoeuvres: gross palpation of the groin (76%) and the flexion, adduction, internal rotation test (ie, FADIR or anterior impingement test) (12%).^{3, 17–88} The flexion, abduction, external rotation manoeuvre (FABER) accounted for 6% of the physical examination techniques performed. The two most common imaging modalities used to diagnose groin pain in the athlete were: (1) MRI at 40% (1870/4655), with 8% (145/1870) specifically using an arthrogram; and (2) plain radiograph at 33% (1545/4655), with 51% (795/1545) of studies not reporting the specific views used (table 3).


Darren de SA et al. Br J Sports Med 2016;50:1181-1186

ALTIUS SWISS SPORTMED CENTER

swiss olympic APPROVED

Andy MURRAY

Sam



ALTIUS SWISS SPORTMED CENTER

swiss olympic APPROVED

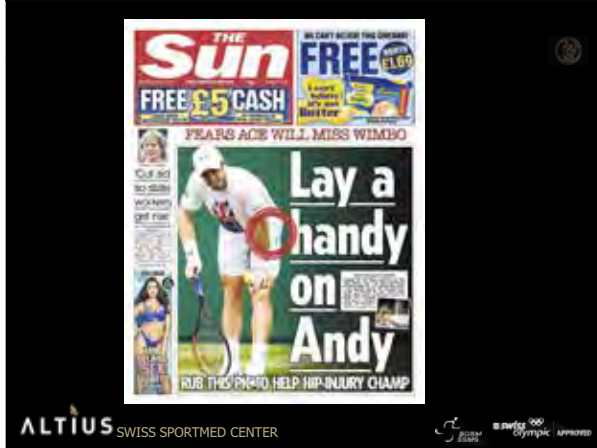


Table 1	Prevalence	Prevalence per 1000 h	Male	Female	Age
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30
Acetabular labral pathology	100%	1000-10000	100%	100%	10-30

Of these top five aetiologies, the majority were reported in young patients in their mid-20s (table 1). Athletic pubalgia, adductor-related pathology and inguinal pathology were almost exclusively reported in male patients, with rates of 98.0%, 99.2% and 96.6%, respectively (table 1). Though seldom reported, where available, there did not seem to be any effect of the athletic level (ie, professional, competitive, recreational, etc) on type or severity of the cause of athlete groin pain (figure 2). Though not always reported across all studies, ice hockey and soccer were the most prevalent cause of groin pain due to FAI (67 athletes each) and labral pathology (31 athletes). Soccer was the most prevalent cause of athletic pubalgia (368 athletes), adductor-related pathology (298 athletes) and inguinal pathology (52 athletes) (table 2).^{3, 17-23}

Darren de SA et al. Br J Sports Med 2016;50:1181-1186

Introduction

- Diagnosis and Management of groin pain among athletes is challenging
- complex anatomy of the hip/groin region
- occasionally overlapping extra-articular and intra-articular possible differential diagnoses.
- Whether acute or chronic in nature
- pain can be multifactorial (approximately 27% of cases)
- Presents along a spectrum from mild symptomatology causing training absences to career-altering disability.

Darren de SA et al. Br J Sports Med 2016;50:1181-1186

Prevalence

Prevalence of hip/groin injuries among athletes

- 5–9% of hip/groin injuries are found in high school athletes
- 3–11% in those competing at an Olympic level
- 10–18% attributable to those participating in elite soccer

The incidence of hip/groin injuries among elite soccer players is 1.1 groin injuries/1000 h of athletic activity

> 50% of groin pain in athletes originated from the adductors, iliopsoas or abdominal musculature.

Darren de SA et al. Br J Sports Med 2016;50:1181-1186

GROIN PAIN IN ATHLETES PUBIC RELATED

Acetabular labral groin pain
 Adductor-related groin pain
 Iliopsoas-related groin pain
 Inguinal-related groin pain
 Pubic-related groin pain

Adam Wick et al. Br J Sports Med 2015;49:768-774
 Copyright © 2015 Publishing Group Ltd. & Elsevier. All rights reserved.

BJSM

GROIN PAIN IN ATHLETES ILIOPSOAS RELATED



BJSM

Adam White et al. *Br J Sports Med* 2015;49:768-774.
Copyright © BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. All rights reserved.