

## EDITORIAL

# BUILDING ON STRONG FOUNDATIONS

Previous editions of Medicine Matters have showcased the work of the UEFA Medical Committee and UEFA's medical unit, both of which have made great strides together in recent years, since the medical unit was set up in 2011. Key projects have included firstly, the implementation of minimum medical standards in all UEFA competitions from this season, which has ensured the provision of medical rooms, ambulances, emergency doctors and lifesaving equipment, as well as requiring that all visiting team doctors be briefed in advance on other stadiums' medical facilities or on tournament medical plans. This has been extremely well supported by clubs and national associations in its first season of implementation, something for which all involved should be applauded. Secondly, the first stage of UEFA's three-part football doctor education programme was completed in 2012, since when participants have been using their newfound skills at matches and passing them on to other doctors in their own countries. Finally, UEFA's injury study continues to produce groundbreaking research in the field of football medicine, helping Europe's elite clubs to better understand the causes, mechanisms and prevention of injury and ensuring that they have their best players fit, healthy and out on the pitch as often as possible.

UEFA is continuing to build on these strong foundations. This edition of Medicine Matters not only showcases the knowledge and expertise of members of the UEFA Medical Committee

in the areas of jet lag, groin injury and myalgia, but also includes an update on the progress of the UEFA football doctor education programme, which is now in its second year. The positive way in which Europe's national associations have taken to the cascading of the course's content is real testimony to the commitment within the game to making the best possible medical services available to teams and players. The combination of a solid pre-tournament screening process, minimum standards for the provision of equipment and services at matches and a network of educators trained to disseminate knowledge regarding emergency medical techniques within each individual country means that football medicine in Europe has never been stronger. As chairman of the UEFA Medical Committee, nothing pleases me more than seeing our teams and players given the best possible chance of competing in a safe and healthy sporting environment.

The Medical Committee and medical unit will also be busy this year preparing for the sixth UEFA Medical Symposium, which will be held in Madrid in February 2014. In excellent cooperation with the Spanish Football Federation, preparations are already under way for an event that promises to be UEFA's best medical symposium to date. Planning will continue throughout the year to finalise the speakers, agenda and logistical arrangements for UEFA's flagship medical conference, which represents an invaluable opportunity to showcase the excellent knowledge and skills that exist within Europe's football community and the sport's commitment to high-quality medical services.

I hope that you enjoy this issue of Medicine Matters and that you share my enthusiasm for the great medical work that is being carried out or planned across Europe by UEFA, the national associations and European clubs. ●

**Michel D'Hooghe**

*Chairman of the UEFA Medical Committee*



*Michel D'Hooghe*

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## CASCADING THE UEFA FOOTBALL DOCTOR EDUCATION PROGRAMME



Doctors practise CPR at the first workshop (February 2012)

The UEFA Football Doctor Education Programme (FDEP) is a three-part programme teaching doctors from all 53 of UEFA's member associations the key skills of the modern football doctor. The programme adopts a "blended learning" approach, marrying face-to-face workshops where doctors learn and practise techniques with an online educational support platform containing instructional videos, tests of participants' knowledge and process guidelines for doctors to refer to at any time. An online forum is also in operation, allowing course participants to discuss and resolve key issues between themselves outside of the workshops.

The first of the three course workshops was held in Austria in February 2012, covering the roles and responsibilities of the football doctor and emergency treatment of players. The second workshop, covering the diagnosis and treatment of injuries, will be held in Amsterdam in September 2013. The third, on the topic of protecting players, will be held in September 2014. All workshops are run by recognised international experts in the relevant fields, and participants are required to undergo a rigorous testing process at the end of each workshop to evaluate the skills and knowledge obtained. Only those participants who successfully complete this process are authorised to pass those skills and knowledge on to their peers at a cascaded workshop.

The first workshop has already shown its worth, with one doctor who attended the workshop – Zdravko Taralov of Bulgaria – saving the life of a youth player using the techniques that

he had learned on the course. He describes the situation below:

*"During the second half two players clashed heads, with one lacerating his lip and swallowing his tongue. I attended to the injured player and found that he had an airway obstruction and was experiencing hypoxic convulsion, which is an extremely serious situation. Thanks to the emergency skills that I had learned on the UEFA Football Doctor Education Programme, I was well prepared and confident in treating the player. His life was saved and he was transported safely to the hospital – a great outcome."*

As well as learning key skills, one of the unique aspects of the FDEP is that all participants are taught how to "cascade" their own version of the course for doctors in their own country. Thus, UEFA has now begun to create a network of skilled medical tutors disseminating the skills learned on the course across Europe's wider football community. This, combined with UEFA's Minimum Medical Regulations (MMRs), which require clubs and associations to provide emergency medical equipment and services at all UEFA matches, means that considerable steps have been taken to improve the medical support available to players. Thus, as the cascading aspect of the FDEP develops in tandem with the MMR in future, UEFA's matches and competitions will be supported not only by a set of guaranteed medical services and standards, but also by increasing numbers of doctors trained to apply techniques and use equipment that could make the difference between a life being lost and a life being saved.



## Cascading

To date, 12 cascaded courses have taken place (one being a joint course for three countries), details of which are provided in Table on the right. Some countries already have medical courses that cover those topics and are recognised by UEFA as being of a high standard, and in such cases cascading may not be required, subject to UEFA's approval. However, it is of some significance that a number of national doctors in 14 countries now have football-specific life-saving skills that they may not have had before they attended a cascaded course. This is a great credit to those national associations, which have recognised the value of the FDEP and supported the delivery of cascaded courses by their FDEP participants.

In order to maintain UEFA's high standards, all cascaded courses must follow the course manual and course structure used for UEFA's own workshop. UEFA offers both translation support for course materials and logistical support for practical sessions, with national associations able to borrow the medical kit required for the course from UEFA free of charge. Doctors are also allowed access to the FDEP's e-learning platform to further supplement their skills.

As regards the educational aspects of the cascaded courses, strict requirements are set by UEFA to ensure that all tutors have the medical specialisms required in order to teach other doctors. This is necessary in order for the cascaded course to be recognised by UEFA. Finally, in many cases cascaded courses are attended by doctors from the UEFA Medical Committee, who oversee the successful delivery of the course and ensure that it meets UEFA's high standards and preserves the integrity of the FDEP.

The cascading of the first workshop will continue, while the cascading of the second workshop will commence in October 2013. The development of educational tools for participants is also continuing, with a new online resource entitled "Stop the Clock" set to be released in April 2013. This will allow doctors to test their decision-making skills in emergency situations.

The progress made by the FDEP to date has been significant, and with the continued strong support of European football's medical commu-

Cascaded courses		
Country	Date	Location
Czech Republic	15/16 December 2012	Kunice
FYR Macedonia	22 December 2012	Skopje
Iceland	11/12 January 2013	Reykjavik
Israel	28/29 August 2012	Tel Aviv
Kazakhstan	24-27 January 2013	Almaty
Liechtenstein	30 June 2012	Vaduz
Norway, Sweden, Denmark (combined)	6/7 December 2012	Stockholm
Scotland	1/2 March 2012	Glasgow
Serbia	17/18 August 2012	Stara Pazova
Spain	15/16 February 2013	Madrid
Turkey	26/27 December 2012	Istanbul
Ukraine	17 July 2012	Kyiv

*Summary of cascaded FDEP courses conducted as at 1 April 2013*



*UEFA's "Stop the Clock" online educational tool*

nity and national associations, UEFA will continue to develop the course to ensure that players can compete safely in all competitions, regardless of the host country – supported by doctors with the same skills and knowledge, regardless of whether they are from Tallinn, Turin, Tel Aviv or Trabzon. ●



*Doctors gather for the cascaded Spanish FDEP course (February 2013)*



# JET LAG: DISRUPTION OF A PLAYER'S BIOLOGICAL CLOCK ON LONG-HAUL FLIGHTS

By Dr Juan Carlos Miralles, member of the UEFA Medical Committee

Many football teams use the aeroplane as the natural means of transport for the many journeys they have to make, whether during pre-season, the league calendar or international competitions. Matches are played in close succession, often in stadiums that are far away – even on different continents. In some cases, players may travel across more than five time zones to play a match, and may be required to compete soon after landing.

This would not be that serious were it not for the physiological changes that flying over more than five time zones can cause in aeroplane passengers. These changes are commonly known as “jet lag”, “desynchronosis” or “time zone change syndrome” and are effectively a disorder affecting the circadian rhythm in the human body. The circadian rhythm is the 24-hour cycle of biochemical, physiological and behavioural processes.

The human biological clock is driven by external environmental factors such as light and dark. It regulates daily activities such as sleep, waking, body temperature, arterial tension and meal-times. The inner clock that sets the rhythms of the human body is located in the suprachiasmatic nucleus of the anterior hypothalamus. It would run for longer than 24 hours were it not for the constant adjustments made owing to various external and environmental stimuli, which directly or indirectly modulate the inner clock.

In some mammals, the light/dark cycle, the availability or not of food, activity/inactivity and social influences can, individually or combined, modulate the biological clock. In humans, the light/dark cycle is very important, as are social habits, and it would also appear that physical activity plays an important role. Light acts as an external stimulus, modulating the inner clock by stimulating the retinohypothalamic tract, especially the pineal gland, inhibiting the production of melatonin. With the advent of artificial light, the importance of the light/dark cycle has changed.

Until the advent of the aeroplane, only people working night shifts showed symptoms of what we now know as jet lag. These symptoms can include any of the following:

- disturbed sleep patterns;
- tiredness during the day;
- loss of appetite;
- constipation, flatulence, bloated stomach;
- mood changes;
- headache;
- feelings of disorientation;
- impaired mental performance;
- impaired physical performance (mostly affecting athletes in endurance and precision sports).

All of these symptoms vary greatly and depend on the individual. Moreover, jet lag is also influenced by factors such as age, the passenger's physical condition, the amount of physical activity during the journey, and acceleration and deceleration during take-off, landing, ascent and descent. Another important factor is the dry air in the cabin and the cabin pressure, which can be equivalent to being around 3,000 metres above sea level. This causes a considerable drop in blood oxygen saturation and inhibits the supply of oxygen to the brain. Other factors also aggravate jet lag, such as heat, humidity, air pollution and the altitude of the destination. Thus, a player's performance will be significantly affected after a long-haul flight crossing five or more time zones.

It is important to recognise the effects of jet lag and know how to deal with them. If we

*Oscar (in blue) and Chelsea FC had to travel to Yokohama in December for the FIFA World Cup*



AFP



ignore the phenomenon of jet lag, players may lose up to 10% of their sporting and physical performance, which is equivalent to them having only three hours of sleep or drinking a large quantity of alcohol.

Some studies show that one day of adjustment is needed for each time zone change following a flight from west to east, so a passenger needs five to seven days to adjust after an inter-continental flight. Many authors state that psychomotor and mental activity stabilises within two to seven days, reaction speed within two days and core temperatures within four to six days. According to Panfilov (1986), after crossing seven or eight time zones,  $VO_2$  max values drop steeply over the two or three days following the flight and then recover gradually to reach the initial (or possibly even higher) levels between seven and 13 days, normalising completely after 18 to 20 days.

Although any long-haul flight can cause jet lag, travelling from west to east is considered worse than east to west, as the day seems “longer”. Imagine flying from New York to Barcelona. When you land in Barcelona at 22.00, it is still 16.00 in New York. It is difficult to get to sleep, as your biological clock thinks it is 16.00. On the other hand, if you arrive in New York from Barcelona, it is easier to get to sleep.

With flights heading west, adjustment is 30 to 50% faster than with flights heading east. It is interesting to note that long-haul flights going from north to south or vice versa have no effect on circadian rhythms. However, they still produce fatigue owing to intrinsic cabin-related factors and the long period of physical inactivity.

## How to reduce the effects of jet lag and adjust to the new time zone

### Before the journey

Whenever possible, flights should be scheduled such that the team arrives in good time before the match. Departure, arrival and journey times should be taken into account as part of the pre-match planning process. In the week before the match, the player's timetable for getting up and going to bed needs to be adjusted. In that week it will help to be in a well-lit environment for the two hours before bedtime. No afternoon nap should be taken on the days before departure and the player should get up early and go to bed early. A diet rich in carbohydrates and low in proteins will help the brain to capture tryptophan and convert it into serotonin, making sleep easier and better.

### During the journey

Players should wear comfortable clothes, wear progressive compression socks and use a small pillow during the flight. It is recommended that players always use their own pillow for journeys. Watches should be set to the destination time on entering the aeroplane.

It is strongly recommended that players drink lots of liquids, as the cabin air is dry. Fizzy drinks are not recommended, as they may cause gastric problems owing to the effect of air pressure changes on the imbibed gas. Coffee is not recommended because it encourages water loss and stimulates the central nervous system, making it difficult to sleep.

The last meal before the time set for sleeping should be rich in carbohydrates and low in proteins in order to encourage sleep. Carbohydrates provide the basis for the production of serotonin, which is a neurotransmitter that regulates sleep. A breakfast that is high in proteins and low in carbohydrates will help to prevent sleepiness, as will drinking coffee.

It is very important to do stretching exercises in the cabin aisle and static exercises while seated, stretching the lower extremities, trunk and cervical region.

Using earplugs and a face mask encourages rest and improves the quality of sleep.

During the flight, players should take off their shoes.

If arrival is at night, players should try not to sleep for the last few hours of the flight. If arrival is in the morning, players should sleep for the last part of the journey.

### On arrival at the destination

Team and player training sessions at the destination should be conducted in daylight and should not be too intense, in order to avoid any injuries that might result from the physical fatigue caused by the journey.

Long afternoon naps should not be taken, as if they are taken at the time when the player normally sleeps at home, they will make sleeping at night more difficult and delay the main biological clock's adjustment to the new time zone. In this case, exposure to bright light, preferably natural light, is a useful antidote to sleepiness.

For the first three days at the destination, breakfast should contain high levels of proteins and low levels of carbohydrates. Equally, the midday meal should contain plenty of carbohydrates and low levels of protein. Supper should be light.

### Other means of fighting jet lag

Melatonin is a hormone secreted by the pineal gland at night, in the absence of light, and may help the body to adjust faster to the new time zone. However, there is no scientific research proving that taking this hormone efficiently compensates for time zone changes. In fact, this product may even contain impurities that could give a positive result in an anti-doping test. If melatonin is taken, the dose should be 3mg before bedtime for the three days before the journey. This should then be taken while on the aeroplane at the time the player should be going to bed at the destination, and also at bedtime for the first three days at the destination. ●

# GROIN PAIN IN ATHLETES

By Dr Henrique Jones, member of the UEFA Medical Committee

## ABSTRACT

Owing to the complexity of the groin region's anatomy, groin pathology is probably one of the most eclectic in sports medicine. Groin pain represents a "multiple pathology" paradigm and may involve many areas, including general surgery, orthopaedic surgery, urology, gynaecology and neurology.

The purpose of this article is to consider how groin pain may present in an athlete's various activities, and how the appropriate conservative, or surgical, treatment can be applied. This will include discussion of an "all in one" surgical approach as a potentially preferable approach to complex groin pain.

## INTRODUCTION

Groin pain in elite athletes is a common yet challenging diagnostic and management dilemma for the sports clinician. Overall, groin pain accounts for approximately 5-18% of all athletic injuries. Sports where athletes are required to kick generally produce most of these injuries. Multiple pathologies often coexist, potentially causing similar symptoms, and several organs and systems can refer pain to the groin. Athletes with groin pain may try prolonged rest and/or various treatment regimes, and often they will receive differing opinions regarding the cause of their pain. Despite advances in the prevention and treatment of these injuries, many athletes will need surgery to fully resolve the pathology.

## DEFINITION

Groin pain in athletes refers to discomfort noted around the lower abdomen anteriorly, the inguinal regions, the area of the adductors and perineum, and the upper anterior thigh and hip.

## HISTORY

In 1924, Beer described inflammation of the pubic symphysis as a result of urologic surgery, suggesting that this was an orthopaedic condition caused by urologic surgery. Spinelli was responsible for the first sports-related description of this pathology in 1932 when discussing a new sporting injury: groin pain in fencers. For this author, the syndrome resulted from the requests of the back foot in abduction and external rotation, and since then numerous sports-related phenomena involving groin pain have been reported.

## INCIDENCE

Groin pain is a common complaint among elite sportsmen and women and the general public. It affects many athletes, particularly those participating in sports involving kicking, rapid acceleration and deceleration, and sudden changes of direction. It has been shown to be a

regular occurrence among football, rugby and hockey players, although any athlete could develop this condition. The true incidence of groin injury is unknown, but some estimates are as high as 30-40% of all sportspeople.

Severe groin pain, defined as that which significantly disrupts performance and frequently requires surgical intervention, has a reported career incidence of 4-6% in professional football players and 10% in ice hockey players. Studies in Scandinavia have shown a groin strain incidence rate of 10 to 18 injuries per 100 football players. Giza et al. reported that 9.5% of all professional US male soccer players incurred a groin strain in the 2002 season. Ekstrand and Gillquist documented 32 groin strains in 180 male football players, accounting for 13% of all injuries over the course of one year.

## RISK FACTORS AND GROIN PAIN PATHOGENESIS

Several proposals have been made to help identify probable risk factors influencing the occurrence of pelvic overload injury. These include:

1. muscle strength and balance: force imbalance (at the symphysis pubis and surrounding the pubic bone) between abdominal and adductor muscles;
2. overuse: training regimen (including warm-up), fatigue, flexibility, body mechanics, sport-specific activities, movement technique, previous injury and psychological state;
3. positive feedback from secondary phenomena, such as chronic inflammation, calcification, herniation, increased compartment pressure and nerve entrapment, all of which may create greater muscle dysfunction.

## ETIOLOGY – MOST COMMON GROIN PATHOLOGY IN SPORT

It is very important to assess whether the pain arises from above the pubic tubercle (upper groin pain) or below the pubic bone (lower groin pain) – see Figure 1.

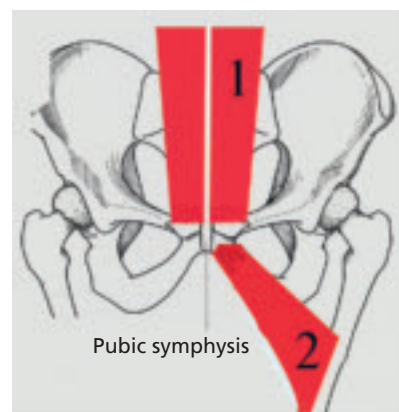


Figure 1: The pubic tubercle as the point of reference for distinguishing between upper and lower groin pain



The most important local pathologies associated with groin pain are listed below.

1. **Adductor strains:** If most of the symptoms arise from the lower groin or perineal area, an adductor tendon strain should be considered.
2. **Abdominal strains:** This may be due to strains involving the attachment of the inguinal ligament, lacunar ligament, conjoint tendon and rectus tendon.
3. **Osteitis pubis:** This is very often over-diagnosed, but there is an extensive list of causes.
4. **Sports hernias:** Many specialists consider that athletes with groin pain have some kind of hernia and call it a “sportsman’s hernia”. This is despite the fact that the athlete often does not have any kind of hernia problem.
5. **Nerve entrapment:** This is pain which starts around the inguinal ligament but radiates down to the inner thigh and adductor area. This is probably caused by referred pain in the obturator nerve. The lateral femoral cutaneous and ilioinguinal nerves can also be involved in local pain.

### THE IMPORTANCE OF SPORTS HERNIAS

A weakening of the posterior abdominal wall, resulting in an occult direct or indirect hernia, causes a sport hernia. The precise cause of this injury is largely the subject of speculation, but the injury probably reflects numerous factors. Theories cite overuse, muscle imbalance, increased shearing forces across the hemi pelvis, and possibly a genetically weakened inguinal wall. It is not known whether biomechanical abnormalities contribute to the condition.

There is disagreement regarding the prevalence of this condition. Some investigators believe sports hernias to be a rare cause of groin pain, whereas others believe that this condition represents the most common cause of chronic groin pain in athletes.

The sports hernia presents as a gradually worsening deep groin pain that is diffuse in nature. It may radiate along the inguinal ligament, perineum and rectus muscles. Valsalva manoeuvres (such as coughing) and bending down may increase pain. Radiation of pain to the testicles is present in about 30% of afflicted men. On physical examination, no true hernia is discernible, because only the deep fascia is violated.

Clinically, it is difficult to distinguish between the sports hernia, groin disruptions, distal rectus abdominus strains, adductor strains, stress fractures and osteitis pubis; however, with sports hernias, the pain may be located more laterally and proximally than with groin disruptions and distal rectus strains.

### GROIN STRAIN – THE REAL PROBLEM?

A groin strain is analogous to “tennis elbow”, which has been shown to be due to an enthesopathy relating to the insertion of the extensor tendon into the periosteum of the lateral epicondyle

of the humerus – i.e. the insertion (the enthesis) has become inflamed and pathological. Like the conjoint tendon, the abdominal rectus and adductor muscles can suffer from local strains or tendinosis that can be the real cause of groin pain.

### CLINICAL DIAGNOSIS

Groin pain involves a complex and difficult anatomical scenario which is directly associated with numerous different diagnoses of athletic (see Figure 2) and non-athletic causes of the referred pain. Sometimes the same symptoms can be related to different pathologies and often two or more disorders can be identified (“differential diagnosis”) in the final clinical evaluation.

This shows the difficulty of evaluating athletes, even for experienced physicians, a point evidenced by the fact that in approximately 30% of cases the correct diagnosis remains unclear.

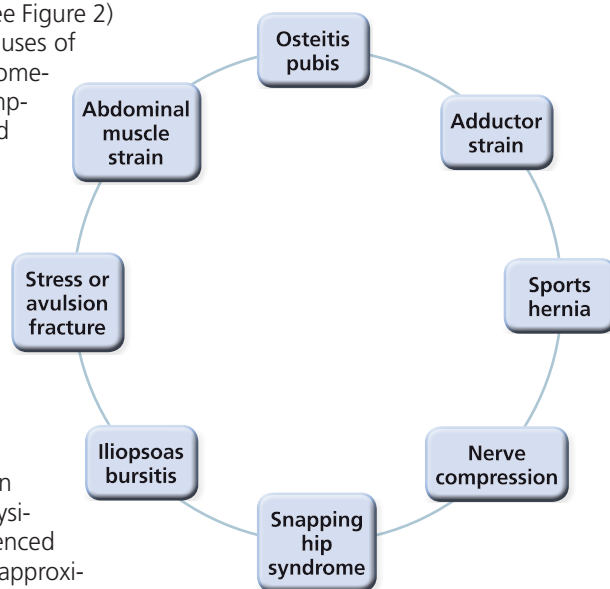


Figure 2: Most common causes of athletic groin pain

### NON-ATHLETIC CAUSES OF GROIN PAIN

When evaluating athletes with groin pain, several non-athletic disorders (listed below) must be considered as a differential diagnosis. It should be remembered that athletes, as normal human beings, can suffer from other diseases, despite their sporting background.

1. **Intra-abdominal disorders:** aneurysm, appendicitis, diverticulitis, inflammatory bowel disease.
2. **Genitourinary abnormalities:** urinary tract infection, lymphadenitis, prostatitis, scrotal and testicular abnormalities, epididymitis, gynaecological abnormalities, nephrolithiasis.
3. **Referred lumbosacral pain:** lumbar disc disease.
4. **Sacroiliac joint disorders:** arthritis, ligament injuries.
5. **Hip joint disorders:** Legg-Calvé-Perthes disease, synovitis, slipped femoral capital epiphysis in younger patients and osteochondritis dissecans of femoral head, avascular necrosis of femoral head, osteoarthritis, acetabular labral tears.

### PHYSICAL EXAMINATION

The clinical evaluation requires local muscle tests (see Figure 3), namely tests on adductors and abdominal muscles, together with palpation around the pubis (see Figure 4) and hernia diagnosis manoeuvres.





Figure 3a: Adductor contraction test



Figure 3b: Abdominal rectus contraction test



Figure 4a: Groin and pubic tubercle



Figure 4b: Inguinal canal and ring palpation

## IMAGE-BASED DIAGNOSIS

Groin pain has been investigated using standard radiography, dynamic ultrasounds, bone scans, computed tomography scanning and MRIs.

The radiographic criteria for the diagnosis of osteitis pubis are as follows: observation of an articular surface irregularity, erosion, sclerosis and osteophyte formation.

Sonography or an MRI could be important to confirm a true inguinal hernia or local soft tissue abnormalities. Although MRI findings (see Figure 5) such as bone marrow edema, adductor muscle

strains and hernias have been described in athletes with chronic groin pain, insufficient attention has been paid to a direct link between clinical findings and functional performance on the pitch.

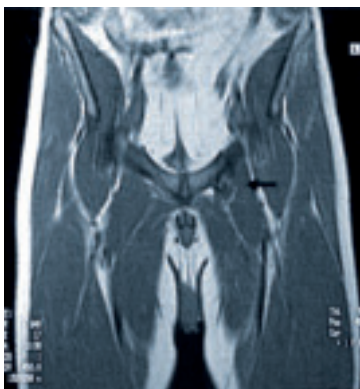


Figure 5: T1 weighted coronal magnetic resonance image showing bone fragments that have a cortex and medullae, close to the pubic ramus and within the soft tissue. This lesion looks like bone fragmentation, but there is no fracture or cortical defect in the pubic ramus.

## CONSERVATIVE TREATMENT

Rest and correlated correction of biomechanical abnormalities (lumbar hyperlordosis, pelvis anteversion, leg length discrepancy, excessive pronation, etc.) are the first steps to be taken in terms of conservative treatment (see Figure 6). With conservative treatment, a return to sport can be expected in four to eight weeks following an acute tendino-muscular strain and three to six months for chronic strains, depending on clinical silence, functional tests and strength. The timing of surgery is influenced by failures with conservative treatment, increases in pain and inability to play sport, the athlete's motivation and economic factors. Surgery would normally be considered after three months.

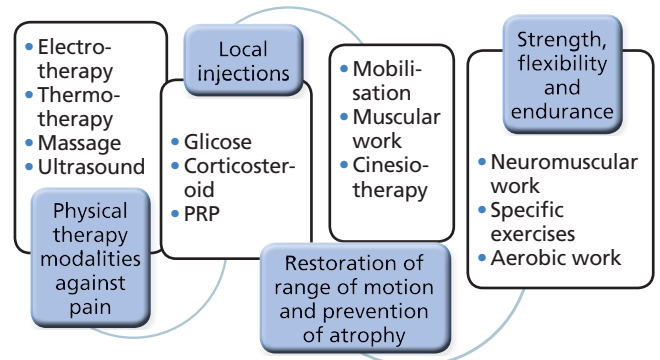


Figure 6: Steps in conservative treatment of groin pain

## SURGERY ON A CASE-BY-CASE BASIS

A sports hernia is a painful groin pathology that affects male athletes. There is no visceral extrusion with a sports hernia and the pain is caused by irritation of the sensory nerve fibres of the ilioinguinal or genitofemoral nerve. Treatment should combine neurolysis of the sensory fibres (while preserving the motor fibres) and repair of the muscular defects (see Figure 8). A laparoscopic or open herniorrhaphy should be performed.

In the majority of cases, the problem is insertional tendinosis around the pubis. The treatment, in that case, should involve tenotomies and the drilling of holes (see Figure 7) if the pubic bone is affected.



Figure 7a: A tenotomy



Figure 7b: Drilling





Figure 8a: Laparoscopic herniorrhaphy

Figure 8b: Neurolysis

In any given case, all potential pathogenic causes should be analysed and corrected. The need to adapt the surgical approach on a case-by-case basis requires a multifactorial approach to surgery described by the author, in some cases, as an “all in one” surgical procedure (see Figure 9).

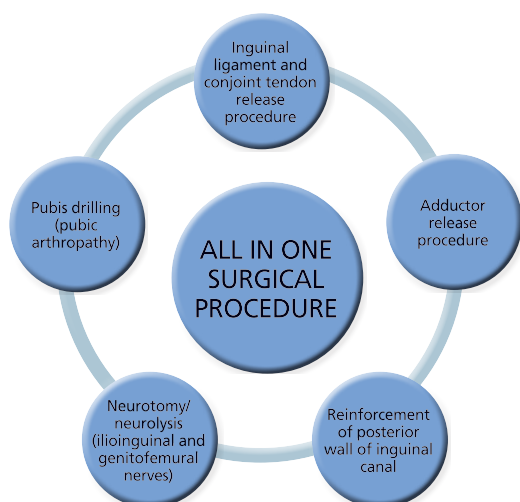


Figure 9: Author's “all in one” method for complex surgical treatment of groin pain

## RETURN TO SPORT AFTER SURGERY

After surgery, up to 90% of athletes will return to their pre-injury activity levels. This can be achieved by means of a rehabilitation programme focusing on strength, flexibility, neuromuscular control, preventive exercises and sports integration. Once athletes have regained at least 80% of their strength and have a full – pain-free – range of motion, a return to sport may be allowed. A return to competition will take 8-12 weeks post-surgery.

## PREVENTION

Prevention continues to be the key factor in reducing incidence of groin pain in athletes. Specific exercises after training sessions (see Figure 10) and gym work – whether as preventive measures for the entire team or on the basis of individual programmes – have made a large con-



Figures 10a and 10b: Exercises to prevent groin pain



tribution to the overall reduction seen in the incidence of groin pain in athletes in recent years.

## CONCLUSIONS

Frequently observed in several sports, groin pathology is probably the most eclectic in sports medicine. This is due to the complexity of the groin region's anatomy.

Groin pain represents a “multiple pathology” paradigm involving general surgery, orthopaedic surgery, urology, gynaecology and neurology. Physicians and surgeons must work together to ensure a correct diagnosis and proper treatment. This means that all physical examinations and complementary studies must be conducted in a systematic manner.

Surgical management has a role to play where conservative treatment of chronic groin pain fails, and more than one surgical approach should be considered. With various different pathologies coexisting, there are a number of surgical options to choose from, and sometimes specialists in different areas need to work together.

Further research in this area, particularly as regards the inclusion of reliability studies and control groups, could be useful in terms of the consistency of diagnosis and the promotion of appropriate therapies. ●

# MUSCLE PAIN AND FOOTBALL

*By Dr Pierre Rochcongar, member of the UEFA Medical Committee*

Muscle pain that emerges from playing football brings many patients into the doctor's office.

Pain in several muscles, most often symmetrical, is very frequently associated with DOMS and (in young footballers) very rarely indicates myopathy (glycogenosis or mitochondrial cytopathy).

If the pain is local and is associated with the playing of football, besides intrinsic and extrinsic anatomical lesions, whose classification, diagnostic work-up and therapeutic management are now well known, a number of other hypotheses should be considered. A rigorous clinical approach is required, and this alone can justify requesting the additional tests that are often necessary for diagnostic confirmation. Eventually, working through the features of a case of myalgia should make it possible to arrive at a therapeutic strategy that may occasionally be confined to changing the training regimen but may in rare cases lead to football being partially or even completely contraindicated.

Overall, if local myalgia occurs regularly in a footballer, nerve or vascular involvement, a supernumerary muscle, chronic compartment syndrome, and even stress fracture should be ruled out (the latter two conditions will not be discussed here).

## A – Nerve trunk involvement

Less common than radicular involvement, nerve trunk involvement should be considered in the presence of local pain that is triggered by physical exercise and that disappears partially or totally when the exercise is discontinued. It is not

always worse at night. Diagnosis is primarily clinical and electrophysiological tests may stay negative for a long time. In certain cases, the anesthesia test may be very useful for confirming the diagnosis.

### In the pelvis and thigh (Figure 1):

- Pyramidal syndrome, related to sciatic nerve compression, presents as gluteal pain radiating to the posterior aspect of the thigh and usually only triggered by running. It is often very long-standing pain. The pain is elicited by resisted contraction and deep palpation of the buttock. The diagnosis can now be confirmed by additional tests, ruling out a spinal cause and possibly revealing hypertrophy of the muscle on the symptomatic side (MRI).
- The syndrome described by Puranen is consistent with involvement of the sciatic nerve over the ischium. Pain is triggered in the seated position, but particularly with dynamic hip flexion and knee extension movements causing stretching of the hamstring muscles (when tackling, for example). The pain radiates to the thigh but also to the buttock. Electromyography rarely provides useful information. Additional tests (MRI, scan) are sometimes deceptive, or show tearing or fibrotic scarring.
- Compression of the iliohypogastric nerve at the iliac crest is accompanied by lateral gluteal pain. This is an exceptional etiology in footballers.
- Involvement of the lateral cutaneous nerve of the thigh is also exceptional, occurring with

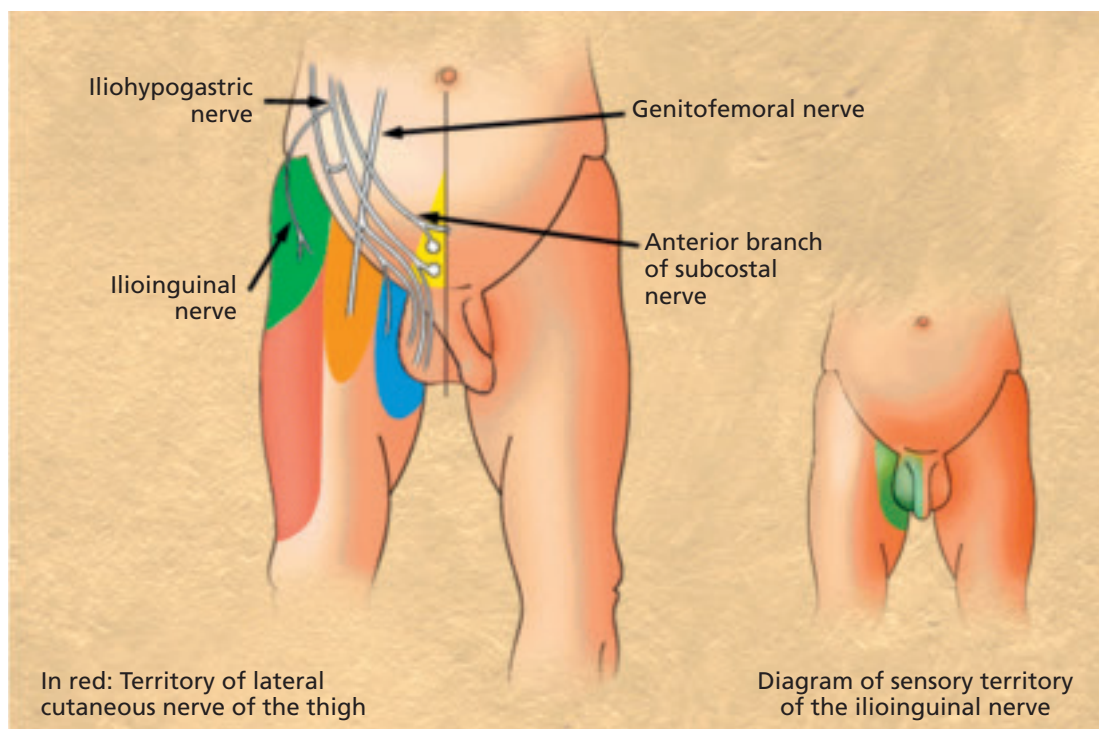


Figure 1: Sensory innervation in the groin area



### Anatomical arrangement of obturator nerve over its entire path and contact with adductor fascia

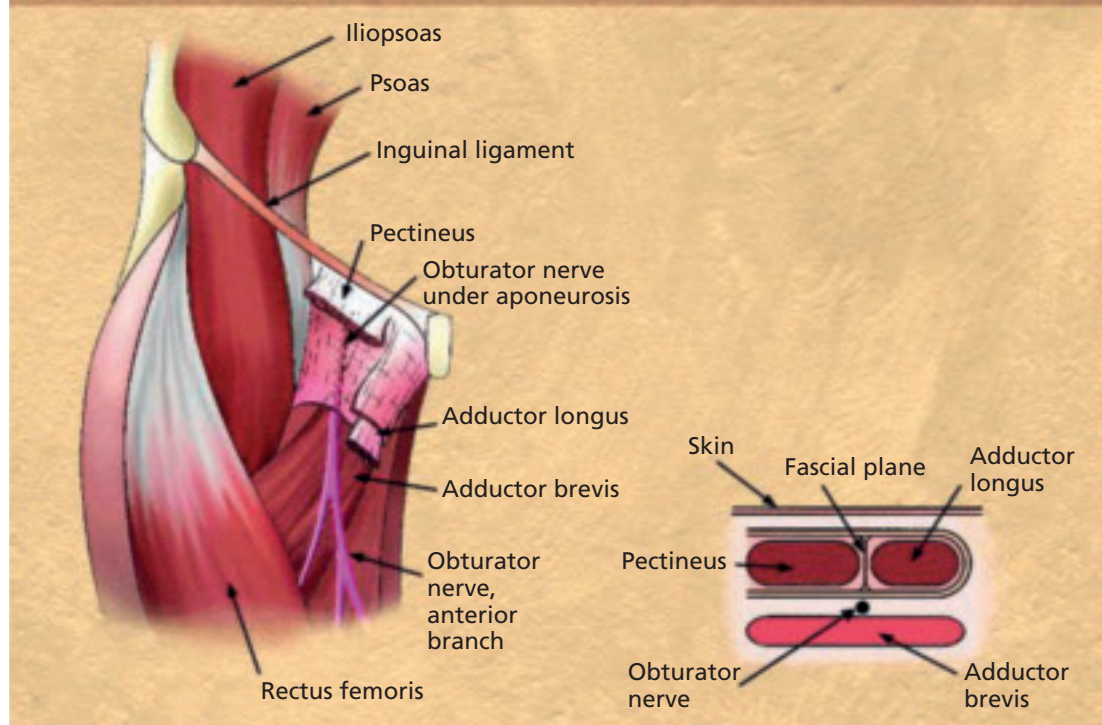


Figure 2: Anatomical path of obturator nerve (from Bradshaw\* Am J Sports Med 1997: 25:402-408)

pain and hypoesthesia located lower down and occupying much of the lateral aspect of the thigh.

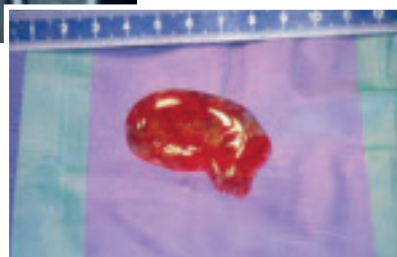
- Anteromedial thigh pain should suggest femoral nerve involvement related to possible direct trauma and even compression such as from lipoma, which MRI readily reveals.
- Compression of the obturator nerve at the insertion point of the adductor muscles (Figure 2) is accompanied by pain on isometric contraction of the adductor muscles, which may wrongly suggest tendinopathy or pubic pain, associated with local hypoesthesia in the middle third of the internal aspect of the thigh.
- At the medial aspect of the thigh, compression, stretching while tackling, or direct trauma to Hunter's canal (subsartorial fascia) is often accompanied by pain in the medial aspect of the knee, rarely extending to the crural segment. This pain should not be confused with tendinopathy or with a patellar or meniscal syndrome.

#### In the crural segment:

- Pain in the anterolateral compartment is consistent with common peroneal nerve involvement (extrinsic or intrinsic compression due to an anatomical abnormality or a synovial cyst, for example (Figure 3)). It may initially manifest as exertional pain incorrectly suggesting



Figure 3: Popliteal cyst



chronic compartment syndrome. Hence, the physical examination and tests should always be done after an exercise that triggers the symptoms in order to identify a transient strength deficit in the ankle dorsiflexors. The same approach can be recommended for electromyographic tests.

- Posterior pain. This mainly concerns the sural nerve. This type of medial pain, radiating to the Achilles tendon and triggered by contraction-stretching movements of the gastrocnemius



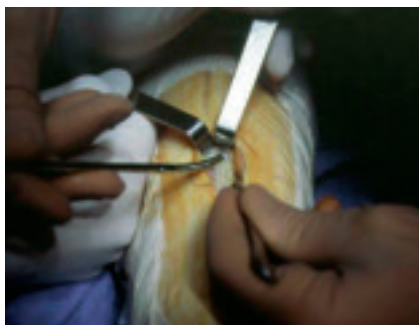


Figure 4:  
Compression  
of sural nerve

and soleus, is often mistaken for a repetitive motion disorder. Examination may show Tinel's sign. Electrophysiological examination of this sensory nerve is often deceptive. In certain cases, imaging reveals a cause such as a fibrous scar. An anesthesia test, while pain is present, is often necessary to confirm the diagnosis. In certain cases, neurolysis may be offered to the patient (Figure 4).

### B – Vascular disorders

In the crural segment: popliteal artery entrapment syndrome may in some cases incorrectly suggest muscle pain.

In the initial stages it may present as intermittent, unilateral calf pain. The sports most often involved are cycling, walking, and swimming – sports in which intrinsic muscle trauma is rare, but the syndrome has been found, albeit less often, in footballers. If the pain disappears almost as soon as the exercise stops, this supports this diagnosis, which is confirmed by a resting Doppler ultrasound with the knee extended and the ankle dorsiflexed. Subsequently, the cause must be sought (abnormal path of artery, muscle compression, etc.) with MR angiography (Figure 5).



Figure 5: MR angio-  
graphy. Dynamic  
compression  
of popliteal artery

### C – Accessory muscles

Described for over a century by anatomists, these supernumerary muscles can be responsible for exertional pain and their existence must therefore be thoroughly understood even though they can be difficult to diagnose.

Once again the clinical picture is fairly stereotypical: local muscle pain triggered by initially near-maximum physical exertion, then within a few months by effort of decreasing intensity, with a tight feeling, pseudo-cramps, and the disappearance of symptoms within a few minutes or, more rarely, within a few hours.

Physical examination shows increased limb segment volume (particularly in the case of the accessory soleus with a unilateral abnormality). Usually it is with isometric contraction against resistance that a swelling, hard on palpation, is found (this is often the case for the semimembranosus (Figure 6) or the accessory medial gastrocnemius).



Figure 6:  
Accessory  
semimembra-  
nosus muscle

If necessary, an electromyogram will confirm the muscular origin of the swelling, but an ultrasound and particularly an MRI scan (Figure 7) will confirm the diagnosis and assist in the decision as to whether surgery is necessary.

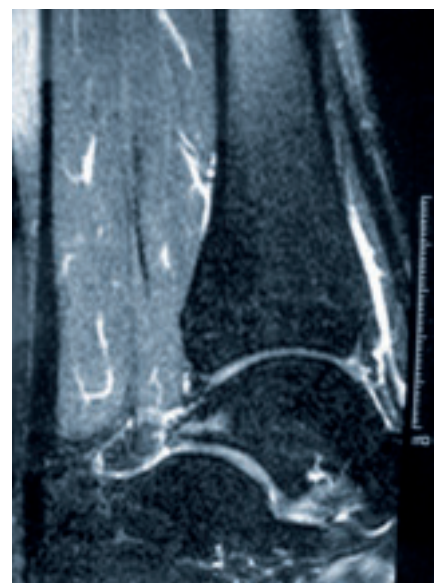


Figure 7:  
MRI, accessory  
soleus  
muscle

## CONCLUSION

Local muscle pain in a footballer always requires management and careful investigation. Usually the physical examination will be sufficient to distinguish between training errors and a true pathological substrate. In this case, it can also point to the appropriate additional tests, which will be helpful only if justified by the clinical features.

In most cases, the diagnosis will enable effective treatment to be offered (nerve, vascular, or muscle involvement). ●