

INJURIES IN PADEL

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INTRODUCTION

Padel is one of the most popular racket sports that is becoming more and more popular every day. The reason is because it is an attractive sport for any public due to the characteristic size of the court, for having a moderate physical demand and being accessible to all. Due to the fact that it is so playable and fun for all ages athletes, trained and untrained, padel can be considered, from an injury point of view, a dangerous sport. It is like tennis but, being played on a smaller court, it is faster and requires plenty of direction changes, turns, cutting, accelerations, decelerations, jumping, landing and braking. It is easy to understand that, if padel is practiced without the necessary preparation and care, it can expose to numerous types of injuries. Also, the unilateral nature of this sport can predispose to unnatural adaptations of the body, risk factors for injuries.

Despite the booming in popularity, a booming in research is still warranted. Literature on padel injury is very limited, often based on limited case series and on mixed population. Therefore, this narrative review will resume some of the aspect related to injuries based on the existent literature but also on the subjective experience of the authors.

HOW MANY INJURIES?

It is difficult to establish the risk of injury for two main reasons. The first is because

padel is a relatively young sport with a limited number of studies analyzing its injuries. Moreover, differently from “older” sports such football or athletics, there is no consensus on the definition of injury and the methodology to be utilized for padel injury research. The consequence of that is the difficulty in comparison of the results of the different studies. In general, with the limited literature we have, we can say that padel has an incidence similar or slightly superior to tennis counting 2.75 injuries every 1000 hours of play that corresponds to 8-9 injuries every 1000 matches. The percentage of the players facing at least one injury every season is included between 50% and 87%. In other words, we can expect that at least half of the players will incur in an injury during the season^{1,2,3}.

ARE THERE INJURY DIFFERENCES BETWEEN MEN AND WOMEN?

There is some evidence that the incidence of padel injuries is higher in women, however it remains unclear if this difference is related to biological differences, training behavior or research bias (women are always more accurate in reporting injuries). In according with Castillo Lozano, in term of injury location, calf injuries are more common in women than in men. This may be explained by gender biomechanical differences, with female athletes requiring more gastrocnemii activation during rapid, unexpected cutting movements typical

of padel to stabilize the knee joint. These considerations remain speculations so far and further studies are necessary to establish if there are real gender differences calf injuries in padel.

Sanchez Alcaraz et al highlighted more injuries in the upper limbs in women, who are more prone to the use of the lob and consequently there is more hitting upper to the shoulder level, which may be a risk factor for shoulder pathologies. Also, rallies are longer and therefore more stress is put on the upper limbs compared with men^{4,5}.

AND BETWEEN YOUNGER AND OLDER ATHLETES?

For what concern differences in term of age, muscle strains are more common in over 35, while younger players are more prone to ligament injuries. Age is a risk factor for muscle strains and probably this is due to a progressive limitation of articular ROM with age and to muscle imbalances typical of older players. Previous injury is also a risk factor: older players have a higher possibility of having been formerly injured⁶.

HIGHER LEVEL OF PLAY, MORE INJURIES?

Apparently, no. Even if the evidence is minimal, it seems that, differently from other sports like football, the injury incidence in padel decreases with the increasing of the level of play. This result could be considered in some way surprising, considering how the speed and the intensity



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of play increases with the level: common sense would suggest that athletes playing faster and stronger should be more prone to injuries. Why the opposite situation? In our opinion the explanation stands in the nature of padel, a sport that can be played by (almost) everyone. At recreational level, we can find people keen to play this fun sport but totally unprepared, untrained and with many risk factors for injuries. Also the lower technique play probably a role^{4,5}.

WHICH KIND OF INJURIES?

Due to the nature of the sport and similarly to tennis and squash, most of the injuries are located to the lower limbs. Injuries to the upper are slightly inferior while trunk is affected in a more limited percentage of cases. Over 10 injuries, we could expect 4-5 injures at the lower limbs, 3-4 to the upper limbs and 1-2 to the trunk¹.

Elbow tendinopathy

Despite majority of injuries are located to the lower limbs, the most injured specific body part seems to be the elbow (about 20% of the total lesions), even if the literature is still contradictory. Tendinopathy is a clinical syndrome, often implying overuse tendon injuries, characterized by a combination of pain, diffuse or localized swelling, and impaired performance. Tendinopathy can also occur without signs of overuse and is then mostly associated with medical conditions. The tendon most affected by overuse is the extensor carpi radialis brevis. The reason of this are the high solicitations of this region and the continue concentric eccentric contraction of the muscles of the forearm. Lateral epicondylitis more commonly affects novice players compared to professional or elite-level players. Recreational players are more likely to hit

their backhand strokes with their wrists in a more flexed position, while elite level players increase wrist extension just prior to ball contact. Recreational players have also been shown to eccentrically contract their extensor muscles, causing repetitive microtrauma to the tendon.] In addition to repetitive movements, one of the most common causes of the development of this injury are the vibrations generated when the player hits the ball and reaching the elbow through the arm. Some padel brands have developed rackets with materials and technologies aiming to reduce these vibrations and therefore trying to prevent the epicondylitis. Of course, other risk factors are, like in tennis, all wrong technique, equipment and grip. The cause seems to be related with repetitive high-demand activities^{5,6}.

Knee injuries

Patellar tendinopathy (often called jumper's knee) is a common cause of knee pain in both recreational and elite padel players, due to the repetitive jumps and side-to-side movements, quick stops and starts, or changing directions. Patellar tendinopathy is more common in male athletes, and they are almost two to four times more likely to develop patellar tendinopathy than females. Characteristics of patellar tendinopathy include pain localized to the inferior pole of the patella and load-related pain that is aggravated by energy storage and release within the tendon such as jumping, landing, cutting, and pivoting. Another common padel injury at knee level is medial meniscopopathy and medial collateral ligament injury. Valgus stress to the knee, either through contact or non-contact mechanisms, can result in MCL injury. Female players are also more commonly affected by chondromalacia patella, a pathology of the internal cartilage of the patella, of the knee caused by continuous friction between the patella and the femur. Despite the high prevalence, the potential etiology and risk factors for developing patellofemoral pain are widespread and remain unclear. The presence of impaired anatomic morphology and/or altered dynamic neuromuscular function can result in an increased potential to experience anterior knee pain with overuse. Frequent participation in padel has the potential to place repetitive stress on the anterior knee resulting in pain⁷.

Lower back pain

Lower back pain is very common in racquet sports. Injuries are prevalent in the spine in elite junior players as well as in both male and female professional players. These injuries include facet joint involvement, muscle strains, and discal pathology. Padel involves multidirectional movements across multiple joints of the spine and upper and lower body. These movements need to be synchronized and are often explosive, rapidly changing between concentric/eccentric and acceleration/deceleration, which requires a high level of neuromuscular control, flexibility, and spinal coordination. Research showed how half of the players suffer of this pathology, 1/5 of them having severe symptoms (Sward et al 1990). High forces are stressing the spine during many movements of racquet sports but particularly during smashes, especially with the “kick” (topspin), jumping, the “remate” (a sort of match to close the point) and every technical gesture implying rotation, extension and lateral flexion. The incidence of back pain and of trunk pathology in general is higher than in tennis and this is due to the nature of padel that is implying more smashes and volleys⁵⁷.

Fascitis Plantaris

Very common sport lesion, although it is usually more frequent in activities such as running, it is often seen in Padel players. This injury is located in the plantar fascia, that is, on the soles of the feet and is described as an inflammation. There are many possible causes but the most common are excessive activity, poor recovery and the use of incorrect footwear (or a change in it)⁷.

Shoulder injuries

The shoulder is the most mobile joint in the human body. Its anatomical design provides stability allowing a wide range of motion in all directions. This leads to a fragile equilibrium between stability and mobility, especially in the padel player, who is trying to generate as much energy as possible for the smashing motion. The repetition of the abduction-external rotation movement of the arm during the overhead action carries an increased risk of overloading various structures around the shoulder. The repetitive movements of padel, such as the smash and the bandejas, are leading to the development of the deltoid, the pectoralis major, the latissimus

dorsi, the biceps and the triceps. The other muscles of the shoulder are less developed and this gives imbalances that can give rise to different pathologies and muscular compensations difficult to correct and that require a postural reeducation and improvement of the technique. The cause of shoulder pain in the overhead athlete is very difficult to identify and diagnose. Pathologic contact between the posterior margin of the glenoid and the articular surface of posterosuperior rotator cuff tendons is known as posterior internal impingement. Young overhead athletes usually go to specific osseous and soft tissue adaptations including glenohumeral internal rotation deficit (GIRD), increased humeral and glenoid retroversion, acquired glenohumeral anterior-posterior instability, scapular weakness, and concomitant rotator cuff weakness. The chronic repeated compression or impingement leads to articular tears of the rotator cuff tendons as well as lesion of the superior labrum (SLAP lesions). The supraspinatus tendon is the most affected followed by infraspinatus, subscapularis and teres minor. It is an overuse pathology that causes pain and disability in the shoulder and upper arm⁸.



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The positive effects of padel are also psychological. It has a positive effect on stress and anxiety. Moreover, the speed of changes in padel heavily challenges the brain.



Tennis leg.... or Padel leg?

The tennis leg is a calf injury that, in most cases, occurs at the junction between the medial head of the gastrocnemius and the soleus. Specifically, this injury is a partial or complete rupture of the fascial attachment between these two muscles. Tennis leg injuries may also occur either at the lateral head of the gastrocnemius or within the belly of the gastrocnemius muscle itself.

In padel like in tennis, tennis leg most commonly occurs after an explosive movement, when the knee is rapidly extending (straightening) during the pushing off phase of running or jumping. During this action the gastrocnemius muscle, when the calf is subjected to high forces, can be disrupted. The highest occurrence of tennis leg is in poorly conditioned men over 40 years old, because they're suffering initial stages of muscle atrophy and degeneration. Seeing the increasing padel "army" of over 40, should we soon change the name of this injury?⁹

Eye injuries

The padel ball can reach up to 190 km/h and an impact directly in the eye can cause quite important consequences and even the loss of vision for a variable period. The risk of eye injury is also increased by the unpredictable rebounds of the ball and the relatively close distance between the players. Reports of eye injuries in padel are increasing, however, it is unclear if this is due to the increasing of the sport popularity or there is a specific risk factor related to the sport. The best

treatment after an ocular trauma is an immediate stop from sport and the urgent referral to an ophthalmologist, to evaluate the state of the damaged ocular structure and prescribe the appropriate treatment. In term of prevention, the use of protective eyewear is advised¹⁰.

RISK FACTORS

Of course, in general, padel injuries may have different causes.

The main risk factor is, in our opinion, the lack of training or, if we want to define it differently, the frequency of play. Padel is booming because is so fun that become addictive. Therefore, amateur players tend to play as many times as possible, without a satisfactory physical preparation and not giving the body an adequate recovery time. Each padel player is different; however, in general, training without overstressing the body, with the correct intensity and performing an injury prevention program is the correct way, together with recovery, to improve physically and minimize the risks of injury.

Inadequate warm-up is another risk factor. There are not specific warm up strategies that has been shown reducing the risk of injury but we should follow the general principles of warming up in sports, activating progressively all muscle groups involved in the padel practice and progressively performing all technical gestures required during a game.

Technical errors can be at the basis of upper limbs and spine injuries. Extreme or

incorrect grips, lack of coordination of the kinetic chain, way of hitting the ball: all of these can be source of pathology. Make changes to the technique may be sometime necessary (even if sometimes frustrating). In general, you are at less risk of injury when you are able to generate force and effects as more natural as possible.

Muscle weakness, lack of flexibility and imbalances can predispose to injury as well. A proper assessment and eventual correction are vital to help the body to absorb external forces better, protecting joints and soft tissues from pathology.

Finally, another risk factor is the equipment: a wrong one but also a recent change can lead to overuse pathologies. An expert advice, especially on shoes and pala could be important.

ARE GLASS WALLS SAFE?

In 2018, the top player Paquito Navarro crashed through the glass wall of a padel court. Even though there were no health long term consequences for the player who sustained only superficial cuts, this raised concern of safety. Padel glass walls nowadays undergo extensive testing and therefore the risk of breakage is very limited. Moreover, they are made of tempered glass, that, in case of accident, would break in chunks rather than tiny shards, further limiting the risk of injury. Despite this, when this event arises, it is necessary to intervene immediately to avoid consequences that could become serious for the athlete.

BENEFITS OF PADEL

In terms of health, improve muscle strength, reflexes, coordination and body elasticity. Due to the dynamic of the game, people of all age can play and therefore older people can take advantage of these effects, in an age where they are even more beneficial.

The positive effects of padel are also psychological. It has a positive effect on stress and anxiety. Moreover, the speed of changes in padel heavily challenges the brain. There is a fantastic combination between the brain, challenged as said to its limits (a lot of episodes and a lot of “geometry”) and the body that has to move a lot, without being necessary a very advanced technique. Additionally, all these challenges are giving a lot of adrenaline to the brain. And all the points won provide dopamine (reward center) and endorphins in the brain, meaning more rewards in padel than with other sport technically more difficult.

Finally, social effects are also present. Padel improves social relationships, also because it is a team sport. In according with the literature, amateur players dedicate an average of eight hours per week to padel activity. This is important in term of compliance. Many sports have beneficial effects on health, but the compliance is an issue. It seems that padel doesn't have this problem, therefore it should be highly taken into consideration when creating healthy lifestyle programs for the general population.

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