PAIN SYNDROMES OF THE RETROFOOT AND ANKLE

LATERAL ANKLE INSTABILITY

SUBLUXATION OF THE PERONEAL TENDONS

Osteochondritis of the talus

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Summary:

Ankle sprains are one of the most common injuries in daily life and sports. On certain occasions, they will produce pain in the hindfoot and ankle in the long term. Up to 20% of them may produce chronic ankle instability. In addition, they can be the cause of peroneal subluxation due to a retinacular lesion, or osteochondral lesion of the talus, and the lesions can be combined in the same patient. This can be the cause of chronic pain in patients who have had a previous sprain. Clinical examination is essential and a lack of control over the joint, pain at the tip of the finger or the sensation of the peroneal tendons on the fibula may call attention. It is essential to assess the axes of the hindfoot. To make an adequate treatment, it is essential to get the diagnosis right, and start with a functional and preventive rehabilitation. If conservative treatment is not enough, in the case of chronic ankle instability, the first surgical option to assess will be direct or anatomical ligament repair (open or arthroscopic). In the event that the ligaments are not strong enough, we will use anatomical reconstruction techniques, with different grafts as reinforcement. In cases that fail, or in highly evolved stabilities, we will opt for non-anatomical techniques. It is important to assess joint status as a whole, associating arthroscopic techniques to assess possible associated chondral lesions. In the case of peroneal subluxation, it is important to assess it within the differential diagnosis, in order to diagnose it acutely, and to carry out an adequate conservative treatment by means of immobilization and discharge for six weeks. In cases of peroneal tendon subluxation and lateral pain, surgical treatment will be deepening of the peroneal groove, either through tenoscopic or open vision, or reconstruction of the peroneal retinaculum. Osteochondritis of the talus is another possible cause of hindfoot and ankle pain where it is essential to rule out instability associated with this injury. We will try to carry out a conservative treatment in asymptomatic patients, acute or non-displaced lesions, immobilizing and unloading for six weeks. In case surgical treatment is considered, we will attend to various factors, based on which we will decide between the various surgical techniques.

Keywords: *ankle, ligament, sprain, instability, peroneal, osteochondritis, pain.*

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1. LATERAL INSTABILITY OF ANKLE:

Ankle sprains are one of the most common injuries in daily life and sports. Up to 20% of these injuries cause the development of chronic mechanical or functional ankle instability, as well as other types of injuries1 . 75-80% of the injuries affect the anterior talofibular ligament (LPAA) in isolation, and 15-20% in these affect the LTFA and the calcaneofibular ligament (LCF), with ruptures of the posterior talofibular ligament (LTFP) being exceptional2 . These instabilities are often accompanied by intra-articular lesions and can evolve towards degenerative arthropathy3,4 .

Chronic lateral ankle instability is It can associate to various cause intra- or extra-articular pathologies, as well as varus dislocation of the hindfoot,3,4 which may make it necessary to associate calcaneal osteotomies with ligament stabilization techniques.

The symptomatology highlights a feeling of lack of control over the joint.

We will complete the study with imaging tests that support the information from the examination. The first treatment option will be conservative through functional rehabilitation

and preventive, enhancing proprioception and strengthening the peroneal muscles2–4 . If the symptoms persist after 6 months of conservative treatment, we would consider surgical treatment. There us are different techniques: he **Anatomical** through direct ligament repair, ligament reconstruction reinforcing with grafts; **non-anatomical** by tenodesis of the either

joints tibiotalar and subtalar. We will associate arthroscopy with these techniques to assess the state of the joint and rule out the presence of associated injuries.

Anatomical techniques restore the joint kinematics and prevent joint stiffness (Gold standard)3,6. Among them, the repair of the LTFA described by Brostrom in 19667 stands out, the reinforcement techniques with the retinaculum of the extensors (Gould's modification)8 and anatomical plasties9,10 .

The success of direct repair depends on the quality of the residual tissue. In patients with chronic instability of long evolution, poor quality residual tissue, obesity, recurrence on previous direct repair, large deformities associated with neuromuscular diseases

or patients with high demand for sports, anatomical reconstruction with ligament plasties9,10 could be indicated, obtaining excellent results with the

ITFA reconstruction using hamstring tendons in chronic ankle instability.

The use of arthroscopy has classically been to diagnose and treat associated lesions. But recently with

The improvement of instruments and fixation and anchoring systems has allowed the development of various techniques of

arthroscopic repair and reconstruction.

CONCEPT OF CHRONIC INSTABILITY ANKLE:

It is a frequent concept in sports traumatology. We classically find two types of instability: mechanical and functional. They usually appear associated, but can appear independent.

Mechanical instability is a laxity abnormally enlarged, objective sign.

Functional instability refers to a alteration in function, presenting with recurrent episodes in which the ankle tends to give way ("giving away sign").

The concept of chronic pathology instability, ankle caused supposed a frequently by a residual lesion, characterized by the patient's reference to a varied symptomatology, but led by a feeling of lack of security, and a subjective perception that the ankle loses its stability joint, frequently giving rise to ankle injuries due to forced inversion.

FUNCTIONAL ANATOMY OF THE ANKLE: It is the most stable joint in the body due to the bony configuration between the tibiofibular mortise and the talar dome, as well as the capsuloligamentous structures that cover the joint and the various tendons that cross it. The lateral ligamentous complex of the ankle functions as a single unit.

functional, and is the most implicated in instability phenomena. This complex consists of the talofibular compound ligament ligament (LPAA), the by fibular-calcaneal (PCL), and the posterior talofibular previous ligament (LPAP).

INJURY MECHANISM: The main cause is a lateral ankle sprain. There are certain previous deformities such as hindfoot varus, midfoot cavus, plantarflexion of the first ray or generalized laxity that are of some importance in predisposing to chronic ankle instability, but the combination of mechanical and functional failure resulting from a sprain acute has been shown to be the main factor in the etiology of chronic ankle instability.

The primary mechanism of injury is forced plantarflexion, ankle inversion, and slight internal rotation as the body's center of gravity pivots around the ankle. This generates maximum stress for the fibers of the entire lateral complex, but especially for the LPAA11

.

Grade III sprains with a complete tear of the LPAA and LPC, with or without involvement of the LPAP and the joint capsule, are the ones that can most frequently give rise to ankle instability, and those that present the most controversy in their treatment.

The most used methods range from immobilization with splints and functional management, to acute surgical repair.

Ankle sprains represent 40% of all injuries suffered by athletes12. 80% of these will resolve without sequelae, but 20% will lead to the development of mechanical or functional instability, which may result in chronic ankle instability.

PATHOPHYSIOLOGY:

Mechanical factors due to the ligament, injury bone variations and the kinematic restrictions of the joint.

The residual presence of elongated, weakened or functionally incompetent ligaments insufficiency that causes a deficit of triggers a this restriction responsible for a large part of the stability.

In the tibiofibular-talar joint there are also differences certain morphological features that may predispose to mechanical instability. There are configurations where the dome of the talus has a larger radius (more flattened) and tibia with smaller articular sectors, leaving more of the articular part uncovered and related to chronic instability of ankle. In addition, increasing evidence that varus tilt of the tibial joint astragalina have an important relation with the development of a chronic insufficiency of the external ligamentous complex13 .

CLINICAL:

The reason for consultation is usually due to a feeling of insecurity and permanent discomfort together with mechanical alterations of the joint such as blockages, pops or clicks. The other consultation is for acute episodes of recurrent sprains, mostly due to low-intensity forced inversion mechanisms, which present with swelling, pain, and functional impotence.

Physical exploration:

On examination, there is some hypersensitivity with swelling in the region of the capsule and the anterolateral ligaments. Joint mobility should be checked

tibiotalar, subtalar and midfoot.

It is also important to evaluate hindfoot deformities, as well as their flexibility (Coleman test), since **hindfoot varus** is a factor of ankle instability even without laxity14 .

Ligamentous laxity is easier to explore in patients with chronic injuries, and the anterior drawer and talus inclination maneuvers will be performed, observing the pits that are formed when performing it and comparing the translation produced with the contralateral ankle.

We will carry out these maneuvers with the knee flexed at 90º to nullify the plantar flexor muscles, and always comparing it with the healthy contralateral ankle.

SCAN BY IMAGE:

-Rx in stress:

Stress X-rays test value for detection of mechanical instability.

Method to quantify the anterior drawer and varus laxity of the ankles with chronic instability where there is hardly any antalgic muscle defense reaction. It is performed with the patient actively forcing and under load a controlled varus.

-Rx on charge:

To assess hindfoot deformities that increase the risk of instability, such as hindfoot varus. Also assess forefoot and metatarsal drop.

-NMR

Study of the state of the ligamentous complex and evidence of concomitant injuries that cause chronic pain ankle. Includes chondral lesions, bone edema, hidden fractures, tarsal pathology, phenomena breast of the periarticular, degenerative tendinopathies and/or processes of entrapment of any kind. It has a high specificity with low sensitivity, so symptomatic patients with a negative MRI should be carefully reviewed.

-Echo:

Some authors15 defend this technique as a second test in expert hands.

It provides the advantage of performing dynamic ultrasound tests, where exploratory maneuvers are applied and the behavior of the stabilizing ligaments is observed. structures

TREATMENT:

Conservative treatment:

Select individually, and the objective will be to combat pain, feelings of insecurity and any type of intra-articular alteration that may help us prevent episodes of instability and/or long-term arthritic changes.

Conservative treatment is based on different modalities of exercises that include proprioceptive training, strengthening and stretching of muscle groups, the use of insoles, splints and bandages.

Specific proprioceptive training through assisted exercises on special surfaces and platforms such as the Bohler, Freeman or bosu plate, which returns to the ankle the unconscious ability to avoid positions that could make it more vulnerable to forced inversion mechanisms.

The strengthening of the peroneal tendons plays a prominent role in the rehabilitation of muscle groups. Reaction times are slowed in patients with instability, which deprives the patient of the protective mechanism against forced inversions and consequent injuries16. The strengthening of the

muscles that cross the ankle through complete and protocolized rehabilitation and proprioception exercises allows the patient to resume their daily and sports life without the need for surgery, especially in cases of functional instability, according to the work of Urguden et al. In it, they evaluated the ability to correct muscle atrophy, proprioceptive loss, and slowing of the reflex arc around the ankle after sprains.

The application of anklets has been shown to be especially effective in terms of preventing and reducing movements that could be the cause of ligament injury17. The use of orthoses can act on various levels of ankle neuromuscular control, improving somatosensory feedback and reducing muscle load18.

the

When conservative measures are insufficient, we must opt for surgical treatment. They are usually athletes, with marked mechanical and/or functional instability, as well as those patients with early arthritic degeneration.

Surgical treatment: Objectives of surgical treatment.

- Results that last over time (subtalar ankle stability).

and

- Full joint balance without stiffness.

Among the many techniques described, the surgeon will have to choose between anatomic (Bostrom or Bostrom-Gould, allograft plasties) and non-anatomic (Watson Jones, Evans, and Castaing) techniques. Today anatomical techniques are those of

first choice (BrostromGould).

The objective of **anatomical grafts** is to restore normal anatomy and biomechanics, maintaining mobility of the ankle and subtalar joint. Its effectiveness will depend on the quality of the tissues.

Anatomical: simpler and faster, fewer incisions, less risk of neurological injury, infection, postoperative pain.

and

In those patients with hypermobility, long-term instability, activities that involve intense exercise, and very heavy patients or recurrences, these techniques will be insufficient, so an anatomical technique with tendons can be used.

hamstrings from the same patient or tendon allograft.

Anatomical techniques are based on suturing direct according to ligamentary Bostrom, tension pure either capsuloligamentary (distension resistant scarring).

The most used in instabilities side chronicles is the modified technique of Boström, with good functional results in both sexes19. The

The results of retrospective studies seem to show superior results in favor of anatomical reconstructions over long-term compared to non-anatomical ones, since there is no loss of subtalar mobility and they do not sacrifice structures such as the peroneal ones1 . The long-term revision rate (8.4 years) in the work of So et al. it was 1.2% in patients treated using the Bostrom-Gould technique20 .

The contraindication of this type of technique will be cases in which there is no ligamentous tissue that allows reconstruction or previous failed procedures. There will also be pre-established situations of genetic hypermobility (ElherDanlos, Marfan, etc.), as well as rheumatic disorders, of character alcoholism and hyperparathyroidism, which are excluded from the indications and present limited success with by this technique fewer.

Regarding open or arthroscopic repair of the lateral ankle ligaments, no statistically significant differences were observed due to the heterogeneity of the sample between both treatments. They do get some results.

Slightly higher AOFAs in arthroscopy, with a higher complication rate, although it did not affect patient satisfaction (96.4% vs. 91.7% in open cx)21 .

ANATOMICAL REPAIR TECHNIQUES:

Open Boström technique:

1. Anterolateral incision in front of the fibula, 1.5 cm with incurvation distla towards sinus tarsus. Avoid peroneal nerve superficial and sural. The LPAA is accessed, which in order to identify it we will have to expose the external capsule of the joint, opening it along the anterior edge of the fibula (retracted ligament fibers appear as a pericapsular thickening).

2. They identify themselves the tendons peroneos and are retracted posteriorly, to identify the LPC.

3. reduction position with ankle in neutral dorsiflexion and slight eversion, traction of the ends of the ligaments and suture.

Other techniques:

Gould et al.8 modified the technique by suturing the retinaculum inferior extensor directly to the capsular plane, reinforcing the direct repair of the LPAA, with good results.

Karlsson et al22 introduced he shortening of the ligamentous fascicles by making holes in the anterior inferior fibula and housing the sutures. Repair of the capsular portion between LPAA and LPC that is reinserted using 2 holes to make a tension suture frame. It is reinforced by the extensor retinaculum towards the periosteum of the distal fibula. Currently there have been

Bone tunnels have been replaced by bone anchoring devices, which prevents excessive weakening of the distal region of the fibula. A harpoon is placed at the anatomical attachment center of the ligaments and fixation is performed using the 4-strand suture. Subsequently, the

extensor retinaculum towards the periosteum of the distal fibula.

As drawbacks bone tunnels they consume surgical time and increase the risk of fracture, while the sutures with a harpoon are simpler, require less time and have a lower risk of fractures, there are also

although

complications such as displacements or breaks23 .

Arthroscopic repair:

Arthroscopic repair will be indicated in patients without hindfoot desac, chronic instability (>6 months), more than three episodes of inversion sprains, a body mass index less than 30, high level of sports activity and compliant with the rehabilitation program.

We will place the patient in a supine position, with a bag under the ipsilateral buttock, and a stop at the level of the contralateral hip. We will leave the patient with the feet on the edge of the surgical table, in such a way that it allows us to work and alternate with the dorsiflexion of the foot during the arthroscopy.

Before performing the arthroscopy, it is recommended to draw the anatomical reliefs: fibular and tibial malleolus, anterior tibial tendon, extensor hallucislongus and extensor digitorumlongus. Giving plantar flexion of the 4th and toe and forced inversion, we will try to visualize the intermediate cutaneous branch dorsal superficial peroneal nerve.

We will make an anteromedial viewing portal, medial to the anterior tibial, through which we will introduce the optics until we are on the joint line, we will open the saline and withdraw slightly to observe the joint line. Next, we will make the anterolateral portal with the help of an adbocat and triangulating. Through this portal, we will introduce the motor and debridement and anterior synovectomy will be performed on unnecessary tissues so that we can work with good vision and visualize the anterior ankle chamber and complete arthroscopic examination.

After moving to the lateral gutter, preparation will begin for the fibula insertion of the LTFA; To do this, we will debride the bone footprint (footprint) using the synoviotome through the anterolateral portal. Next, we will try to locate the remains of LPAA, previously locating the anterior tibiofibular ligament, whose distal insertion at the level of the fibula, intersects with the fibers of the PAA ligament. This will help us to recognize the remains of LPAA, debride the tissue that is not useful, and thus locate it and traction with fyber 2-0 with the help of the Micro SutureLassoTM (Arthrex, Naples, Florida, USA). The ligament is sutured from lateral to medial and will allow us to pull on the tissue to determine the quality of the ligament. The 2.0 mm drill guide is then inserted through the anterolateral portal and rests in the bone imprint, distal to the distal inferior tibiofibular-anterior ligament insertion. A brocade will be made from anterior to posterior.

We will thread the 2.0mm fyber filaments through a 2.5mm anchor and into the hole. You can make one or two holes, placing one or two anchors. To place the anchor and give good tension to the tissues, the anchor will be placed with the foot in neutral flexion and eversion of 5-10o.

Arthroscopic repair has multiple advantages over open surgery: less aggressive, less associated morbidity and better cosmetic results, as well as identifying and treating lesions and the most associated complications. superficial Frequent are injury to the peroneal nerve and/or sural nerve.

Anatomical repair using *allinside* techniques presents excellent functional clinical results, with an early return of the patient to sports activities and a low rate of complications and reoperations.

Sometimes due to poor tissue quality or severe lateral instability, it will be necessary to resort to ligament plasty using an isolated anterior talofibular fascicle or calcaneofibular fasciculus. Both can be performed arthroscopically.

Regarding the performance of the open Boström in arthroscopic repair, Guelfi M. et al21 conducted a systematic review reviewing a total of

505 interventions using Boström

open, with a mean follow-up of 74 months, compared with 216 arthroscopic repair interventions, with a mean follow-up of 37.2 months. The AOFAS scale had a mean score of 90.1 in the first group and 92.48 in the second, with a satisfaction rate of 91.7% and 96.4%, respectively. Although the rate of complications in the open surgery group was 7.92%, while in the arthroscopic one it was 15.27%, mainly sural neuritis and superficial peroneal nerve type. The author's conclusions

were that no statistically significant results were obtained, and that both procedures present excellent results, and they commented that, although the rate of complications in the arthroscopic group was slightly higher, this did not alter the rate of patient satisfaction. Regarding the efficacy and costs of performing the open or surgical procedure, GangZeng et al. concluded that both procedures are effective, and that, although arthroscopy has a smaller incision, open surgery has a lower cost and shorter surgical time24 .

RECONSTRUCTION TECHNIQUES: In the case of athletes with high functional demands, many authors have recommended performing non-anatomical repairs using the peroneus brevis tendon. The results have been satisfactory with respect to the return to previous activity, but there is concern about the increase in morbidity, with less mobility of the subtalar and a progressive deterioration

functional25. Saraglia et al, and Yves Tourné use the retinaculum to form a band that acts as a neoligament, reproducing the path of the LPAA, and at the same time, due to its insertion in the calcaneal joint, stabilizes

the

subtalar.

Anatomical techniques have 80-95%

of good results, with a high degree of patient satisfaction.

Chronic instability is associated

osteochondral lesions in 15-25%, but also an incidence of

soft tissue impingementarterolateral, of calcifications of the lateral malleolus and instability of the syndesmosis. For this reason, an arthroscopy is recommended prior to anatomical stabilization (confirm, evaluate, and treat associated injuries).

Recently the For

arthroscopic repair of the two fascicles, Guilo et al26 propose repair using a gracilis graft, which is a laborious and complex technique. Mark Glazebrook proposes an evolution of this method by repairing the two ligamentous bundles through percutaneous tunneling.

Non-anatomical techniques:

Disadvantages of non-anatomical grafts are that they do not repair injured tissues and they use the peroneus brevis tendon, which is an evertors of the ankle and a basic element in maintaining proprioception (Illustration 1).

Advantages: do not require allografts or obtaining tendon from another location anatomical.

There are various non-anatomical techniques, such as the Watson-Jones, Evans, hemi-Castaing and Chrisman-Snook techniques.

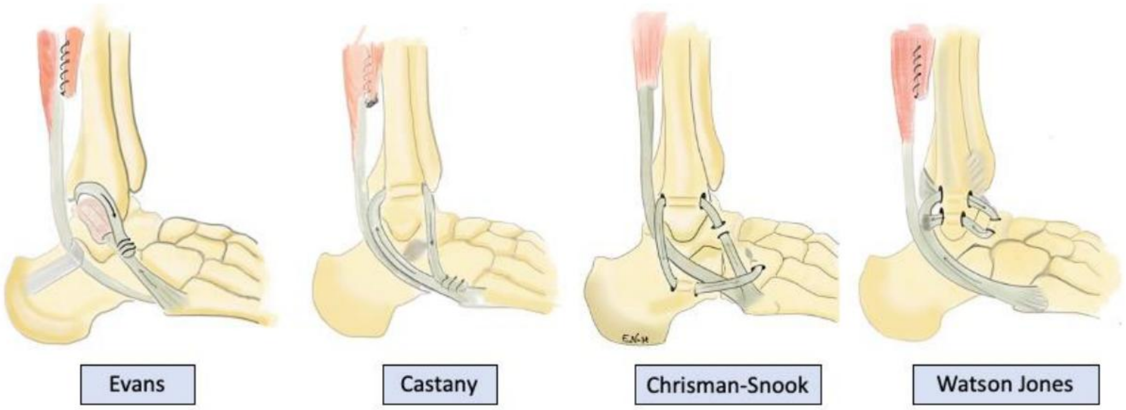


ILLUSTRATION 1: NON-ANATOMICAL TECHNIQUES: EVANS, CASTANY, CHRISMAN-SNOOK AND WATSON JONES

Hennrikus et al.27 prospectively compared 40 patients operated using the Chrisman-Snook technique and the Boström technique. Both groups had more than 80% good and excellent results, but those who underwent Boström had 10 excellent results compared to 3 in the Chrisman-Snook group. This technique also presented more sural nerve lesions and greater stiffness than the Boström technique.

Krips et al.28 conducted a multicenter study where they concluded that anatomical techniques provide better results than non-anatomical ones.

CONCLUSIONS:

Currently, the first choice for chronic ankle instability, the technique of choice would be the Boström-Gould type anatomical technique.

If contraindicated, case we would use an anatomical ligamentoplasty technique using tendon autograft or allograft (open or percutaneous). If I opted for a non-anatomical graft, I would use the modified Chrisman Snook technique.

Associate arthroscopy to diagnose and treat osteochondral lesions.

If there is injury to the peroneal tendons, repair them.

If there is varus deformity of the hindfoot, associate calcaneal osteotomy, +/- dorsiflexor osteotomy Of the first metatarsal.

2. SUBLUXATION OF THE PERONEAL TENDONES

One of the causes of chronic pain at the level of the ankle can be injuries to the tendons Subluxation/ peroneal. dislocation of the peroneus is a rare injury, which in an acute context can be confused with the symptoms of an ankle sprain. In the event of trauma with a foot in dorsiflexion, abduction and inversion, a sudden contraction of the Peroneus Short and Peroneal Longus tendons occurs, which can injure the Superior Peroneal Retinaculum and even dislocate it. The absence of treatment of a

Acute dislocation can lead to a chronic subluxation. More than 90% of these injuries are secondary to trauma sports related. There are some risk factors for this pathology to take into account such as:

Superior Peroneal Retinaculum, the presence of a foot cavus varus, a slightly excavated retrofibular groove, or the presence of a peroneoquartus, as well as the low implantation of the muscular belly of the Peroneus Brevis, which will imply a commitment of space at the level of the groove, facilitating the dislocation of the peroneal.

Two main factors can contribute: lateral ankle ligament instability and hindfoot varus malalignment.

Chronic ankle eversion processes cause laxity or injury at the level of the superior retinaculum, which produces a subluxation of the tendons as they pass through the crest of the fibula, producing a normally longitudinal tendon lesion.

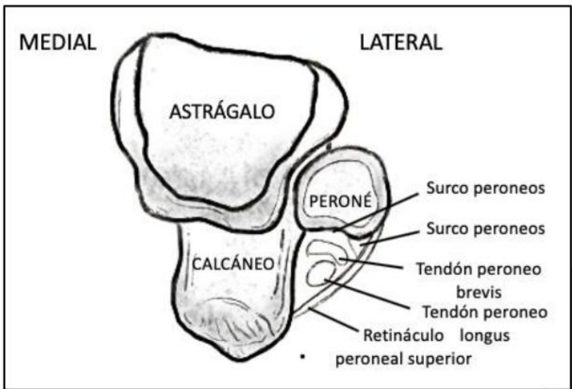
anatomical memory:

The peroneobrevis or peroneus brevis muscle originates in the two thirds distal to the fibula and in the intermuscular septum, to be located posterior to the malleolofibular ligament, superficial to the calcaneofibular ligament and anterior to the long fibular (PL) running through the retroperoneal groove (Illustration 2). The PB tendon is flattened ovoid in shape and inserts on the styloid at the base of the fifth metatarsal.

The fibular longus lies posteriorly on the sulcus, passing inferior to the fibular tubercle on the lateral aspect of the calcaneus, to become medial and plantar around the lateral border of the cuboid toward the first metatarsal. They are covered by the superior peroneal retinaculum (RPS), which arises posterolateral to the fibula and inserts on the lateral tubercle of the calcaneus. The

Inferior fibers inbrate with the

inferior peroneal retinaculum (IPR). It is the main stabilizer of the peroneal muscles in the retromalleolar groove.



At the level of the tubercle of the calcaneus the peroneobrevis is arranged superiorly and the peroneolongus is arranged inferiorly, and both tendons are covered by the

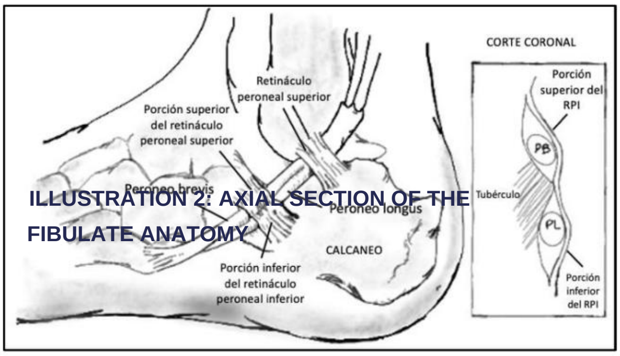


ILLUSTRATION 2: AXIAL SECTION OF THE FIBULATE ANATOMY

inferior peroneal retinaculum (Figure 3).

ILLUSTRATION 3: SAGITTAL SECTION AND SECTION CORONAL ANATOMY OF THE PERONEOS AND ITS ROUTE

Predisposing anatomical factors: Convex or

- shallow fibular groove.
- Cavus Varus Foot.
- Valgo impingement.
- Peroneal tubercle hypertrophy with increased eminence retrotrochlear.
- Os peroneum syndrome.
- PC VM low implantation.

Eckert and Davies classification

- Grade I: Avulsion of the retinaculum fibula, tendons between it and periosteum.
- Grade II: Separation of the fibrocartilaginous labrum.
- Grade III: Avulsion of a bone fragment of the fibula.
- Grade IV: Rupture of the insertion of the

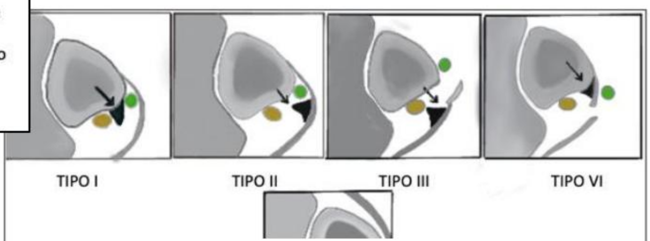


ILLUSTRATION 4: ECKERT CLASSIFICATION AND DEVIES

retinaculum in the calcaneus (Oden).

In Eckert and Davies grades III, bone avulsion can be observed on radiographic images, called FleckSign. It is pathognomonic for anterior dislocation of the peroneal tendons.

- FleckSign: pathognomonic of anterior dislocation of the tendons
peroneal by bone avulsion of the RPS.

Clinic:

The clinic of an acute dislocation will be similar to that of an ankle sprain, with retromalleolar-peroneal pain with a negative anterior drawer. You will have extreme pain and apprehension with counter eversion.

The patient usually reports a tumor on the lateral aspect of the ankle that "comes and goes" with episodes of subluxation/dislocation. Pain makes it difficult to perform activities
sports and daily life, in a variable way, depending on the degree of tendon instability, patient demand and association of tendinopathies.

The symptoms they present are clicking and sensations of instability or pain on the lateral side of the ankle.

Exploration:

The exploration will be carried out by observing the joint range from plantar flexion and inversion to maximum eversion and dorsiflexion, being able to observe the dislocation of the peroneals and the clicking sound it produces.

Posterior retromalleolar swelling, with tenderness and discomfort over the tendons. Presence of pseudotumor on the peroneal tendons.

Voluntary subluxation of the tendons +/- snapping.

Challenge test:

- Apprehension tests: Sensation of apprehension or subluxation with active dorsiflexion and counter-resistance eversion produces subluxation or dislocation.

- Compression test: pain with

ILLUSTRATION 5: TEST OF APPREHENSION

passive dorsiflexion and eversion of the ankle.

When carrying out the maneuvers we can find anything from painless frank dislocation to a slight painful click of intrasheath subluxations29. Sometimes, it is not subluxed through maneuvers, and it is the patient who performs the dislocation voluntarily in
certain movements.

Complementary studies: It is recommended to carry out radiographic studies in internal rotation. In them we can find avulsion of the cortex of the lateral malleolus (flecksign, rim fracture).
Rearfoot (varus) deformities should be evaluated.

MRI is the best to assess in discreetly ankle axial slices with
flexed. In it, we can observe anomalies of the fourth peroneus muscle and distal insertion of the muscle belly of the
short fibula.

- The **fourth peroneal muscle** is the most frequent accessory peroneal muscle, with a prevalence between 10-22%. It is displayed in the
axial sections, at the level of the retromalleolar groove or canal, posterior and medial to the muscle

peroneus brevis and both peroneal tendons. Distally, it is inserted directly or through a tendon in the eminence rtetrotrochlear. It can cause compression at the level of the runner, causing pathological changes in the peroneus brevis tendon or intrasheath subluxation.

- **Distal insertion of the peroneus brevis muscle belly:** usually the tendon of the peroneus brevis Fibula brevis becomes tendinous 2-3 cm proximal to the distal end of the fibula. A prolongation of the muscle belly can compromise the space in the retromalleolar groove.

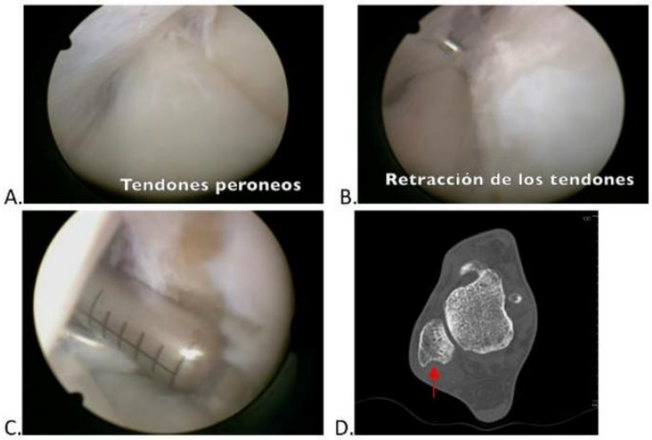
Treatment:

Acute injuries in non-professional athletes will be treated conservatively from the start by means of placement of a suropedic splint and offloading for 6 weeks. It is important to ensure that the tendons are reduced at the time of the immobilization.

In acute injuries in elite athletes or injuries the Chronicles, we will indicate surgical treatment. There are various techniques such as reconstruction soft tissue anatomical procedures, bone stop procedures, and currently the most frequent are groove deepening techniques (open or arthroscopic) with or without bone stop techniques.

DEEPENING OF THE GROOVE:

Osteotomize the lateral portion of the fibula in 3 parts, leaving the most posterior part articulated in contact with the tendons. The bone flap is raised, the underlying cancellous bone of the fibula is curetted, and the flap is reinserted into the deepened bed. The advantages of these procedures are the correction of any alteration of the groove and the maintenance of the sliding surface of the tendons. It's the technique recommended for having a lower recurrence rate and improving all aspects of the pathology.



Through arthroscopy, a distal vision the portal and a proximal work portal are introduced. The peroneals are removed so as not to injure it, and a

ILLUSTRATION 6: A. TENOSCOPY WITH PERONEAL TENDONS; b. RETRACTION OF THE SAME TO BE ABLE TO WORK; C. CHANNEL MILLING AND DEEPENING; D. CONTROL BY CT POSTOPERATIVE

working channel delimiting the groove and making a deepening of the groove with different drills (figure).

OSTEOCHONDRITIS OF THE TALUS:

Osteochondral lesions are entities affecting articular cartilage and bone subchondral at the level of the talus. Konig et al explain that most frequently these lesions are associated with severe trauma, due to compromise of the cartilage and adjacent subchondral bone. However, sometimes these injuries can appear due to chronic repetitive microtrauma, without associating previous serious trauma30. However, more than 38% of medial talus injuries are not associated with a specific lesion and can appear due to localized ischemia at the level of the talus or localized repetitive microtrauma31. It is estimated that around 50% of acute ankle sprains cause some form of chondral injury, while ankle fractures cause cartilage damage in between 73% and 81% of cases32 .

The mechanism of injury has been seen to be related to the prediction of the location and characteristics of the lesion. Classically, lateral lesions tend to be related to a mechanism traumatic, are smaller in diameter, more anterior, more frequently displaced and symptomatic, with a lower rate of spontaneous healing and are less common compared to the medial ones33. The medial ones do not usually have a traumatic history, are usually asymptomatic, do not progress and management is usually conservative. However, more recent literature highlights that the location of the lesion does not have to be a true predictor of the lesion mechanism, as well as the location and characteristics of the medial and lateral lesions, observing that the lesions treated surgically were mainly in the centrolateral third more than centromedial34 .

These lesions share the common characteristics of bone lesions. subchondral with or without damage to the articular cartilage, being potentially reversible if they are not associated with cartilage displacement. Despite joint damage focal, these lesions do not necessarily have to be associated with the eventual progression of ankle osteoarthritis, such as observed Bauer et al. where only 2 of every 30 patients with osteochondritis developed osteoarthritis after a follow-up of about 21 years35 .

Clinic:

It is of great importance to carry out a correct anamnesis. Patients report chronic pain at the lateral and anterior ankle level and many explain previous histories of repetitive sprains, ankle fractures, calcaneus fractures and other injuries as some patients may not complain of pain but of some ankle instability.

Clinically, we have to differentiate the point of maximum pain to make the differential diagnosis of chronic ankle pain. On many occasions, these lesions will present asymptomatically.

It usually presents as a dull, ill-defined pain, sometimes associated with ankle swelling and/ or symptoms of joint blockage36. It is essential in these patients to rule out associated instability, carrying out a correct anamnesis and examination.

Complementary examinations:

Weight-bearing radiographs should be requested in patients with pain to evaluate chondral lesions and other possible bone pathologies. They should include the anteroposterior, mortise, and weight-bearing lateral views of the ankle. However, up to 50% of these lesions will go unnoticed on X-rays31. Benrdt and Harty37 classified these lesions based on the radiographic findings into 4 grades or stages: stage I small area of subchondral compression; stage II partial detachment of the fragment; stage III complete undisplaced detachment and stage IV displacement of the fragment.

Those patients who present a lesion on the X-ray, or who have anodyne X-rays with clinical suspicion, we will request an MRI to identify the lesion as well as see its size and stage. It is the best test to determine the integrity of the cartilage in non-displaced lesions38 .

The CT will provide us with more information to know the size of the lesion, in those symptomatic lesions diagnosed with radiography. Verhagen et al. They found in a prospective study that CT, MRI, and arthroscopic diagnosis were significantly better than clinical history, physical examination, and standard radiographs alone in confirming or excluding the presence of an osteochondral lesion39. The authors Mintz et al.

They saw in a retrospective study on 54 patients that MRI correctly identified intact cartilage versus osteochondral lesions in 100% of cases40 .

Treatment:

Conservative treatment:

It is the indicated treatment in asymptomatic patients, incidental finding, acute non-displaced bone/cartilage lesion, advanced age with low functional demand, arthritic signs in adjacent joints, and immature skeleton of the patient41. Many of these injuries will improve without surgical treatment.

Conservative treatment consists of

restriction of sports activities associating or not treatment with NSAIDs or

immobilization between four and six weeks with load (CAM WALKER) depending on the persistence of the symptoms30 . *Tol et al* reviewed the evolution in patients with lesions in stages I, II and III with medial lesion according to the Berndt and Harty classification treated conservatively. To do this, they divided the management conservative in two groups, one with rest and restriction of physical activity +/- NSAIDs and another with immobilization between 3 weeks and 4 months. In this study the first group had 59% good results compared to 41%

in the second group42. However, in the work of Zengerink et al., the results were 45% success in the group treated by rest while the group immobilized for 3 weeks-4 months had a 53% success.

There are multiple predictors of spontaneous healing that have been studied: patient age, BMI, acute lesion, lesion size, lesion location, presence of cystic changes, ankle instability, presence of loose bodies, functional status, lesions in adjacent bone cartilage, medical comorbidities and lesion progression on imaging tests41,43 .

either

The location of the lesion is a factor.

important that it has been shown that they have a lower probability of cure with conservative treatment33. Heyse et al. independently reviewed

retrospectively a total of 77 osteochondral lesions in juvenile patients (aged between 4 and 15 years) treated initially conservatively. They noted that stage III (complete detachment without displacement) lesions, especially in older children, more often presented with treatment failure when treated

conservatively44 .

Kijowski et al. determined which factors determine the instability of the osteochondral lesion. They observed 100%

of unstable lesions in patients who presented the following criteria: hyperintense signal on T2, with the presence of subchondral cysts, hyperintense fracture line in cartilage on T2, and fluid-filled osteochondral defect. It presented a sensitivity and specificity of 100% in adults, but not in juvenile lesions. This can predict the failed of the treatment conservative in patients with osteochondral lesion who present these characteristics in MRI.

Regarding biological conservative treatment, platelet-rich plasma (PRP) is an autologous blood product that contains at least twice the

platelet concentration compared to normal blood concentration. Platelets contain growth factors and cytokines that are involved in tissue healing and potentially attract mesenchymal stem cells to the site of interest45. Smyth et al. observed in a systematic review that PRP increases proliferation of chondrocytes and meschymal stem cells, proteoglycan deposits, and type II collagen deposits while inhibiting the local catabolic effect of

cytokines46. In clinical studies, a prospective randomized clinical trial was conducted comparing 16 patients treated by bone marrow stimulation isolated and 19 patients with bone marrow stimulation and PRP injection. Guney et al. found that in the group that received PRP there was an improvement in functional results at a mean follow-up of 16.2 months47. Gormeli et al. concluded that an injection of PRP after bone marrow stimulation in lesions

Ankle osteochondrals provide significantly better clinical results compared with hyaluronic acid or saline injections at a mean follow-up of 15.3 months48. The effect of hyaluronic acid has also been studied as

Conservative treatment in osteochondral ankle lesions. Mei-Dan et al. carried out a comparative prospective study between HA versus PRP in 32 patients with osteochondral lesions managed conservatively. The author concluded that infiltrated patients with PRP score had

a

significantly higher on the “Ankle-Hindfoot” scale, visual analogue scale, less stiffness, improvement in function and subjective improvement in global function at 28 weeks of follow-up, compared with hyaluronic acid49 .

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