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REVIEW ARTICLE

# One Anterolateral Impingement Syndrome in Athletes Review article

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Each author of this article has encountered all 04 criterions of authorship:

1. Commencement and design of the study, attainment of data, or analysis and interpretation of information.
2. Drafting the manuscript or rewriting it censoriously for important intellectual content.
3. Providing concluding endorsement of the version for publication.
4. All authors have settled to be answerable for all aspects of their research work

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## ABSTRACT

**Introduction:** Etiology of ankle anterolateral impingement syndrome is physical and clinical. Namely sublocation lateral syndrome of ankle talus and tibia ligaments manifest to chronic instability, pain and synovitis formation.

**Methods:** Impingement syndrome investigated to form mechanic instability to athletes, thus ankle activations associated with sublocation lateral syndrome via literature evaluation.

**Results:** Ankle impingement syndrome typically in progress resulting further ankle flexion movement enhances ankle activation. In this direction, current situation starts anterior tears of *talofibular* and *calcaneofibular* ligaments, however ankle tissues not previously obviously on ligament injury to athletes as quite lateral side performance level.

**Conclusion:** For this information concluded etiology, anatomy, and pathology to special sublocation lateral syndrome on athletes. In reason of results rarely ankle impingement syndrome of common ankle syndromes to athletes may be further examine on ankle flexion movement.

**Keywords:** Sublocation lateral syndrome, ankle impingement syndrome, athletes.

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## INTRODUCTION

Impingement is a clinical syndrome stem from directly mechanic action of bone and ligaments formed excessive joint pain or limitation of movement, in this direction work of image techniques of ankle syndrome are detect of diagnosis and treatment of impingement syndromes elicit diseases of bone and ligaments related the anatomic structure variation[1]. Specifically, ankle impingement syndromes are sublocation of *deltoid* and *lateral* ligaments after musculature strain and some micro-trauma to physical activity intenses develop result of changing ankle flexion movement in athletes[2]. Special sublocation lateral syndromes form synovial scars of anterolateral recess of ankle tibiotalar joint as result current inflammation and hypertrophy scarce enhance lateral side ligament impingement in athletes[3]. Ankle impingement syndrome patients typically are young and athletic, namely special sublocation lateral syndrome is manifested by chronic ankle pain, limited dorsiflexion and swelling of tissues and their ankle activation is indeed weakned, in generally athletes's recurrent ankle inversion injury is quite evident level, this reasons is that anterolateral impingement and the location of the resulting tenderness is the joint line on the lateral side of peroneus tertius[4]. Anterolateral impingement syndrome is caused by lateral compression lateral gutter of hypertrophic ligaments and anterolateral muscoid lesion result of under synovitis of anterolateral gutter[5]. Covering ankle sprain situation of one processes on loading increase and ground stress loading start anterior tears of *talofibular* and *calcaneofibular* ligaments in athletes[6]. Hereby, this condition as ligament injury not serious to chronic instability on athletes, however insufficient strengthening and immobilization produce scar tissue by entailing chronic inflammation[7]. The ankle tissue replacement then becomes trapped between the talus and lateral malleolus, causing swelling, pain and further synovitis, thus chronic lateral ankle pain can affect sport level and exercise performance[8]. The rare occurrence of chronic lateral ankle pain in

athletes is associated with ground reaction loading, previous ankle sprains and rarely anterior talofibular ligament injury as 2-3% occurrence of dominant syndrome[9]. Anterolateral impingement syndrome is consider the etiology of direct microtrauma to the *talus* and *tibia*, and the natural course of this microtrauma is to form bone[10]. Namely, the main causes of trauma of athletes are repetitive microtraumas and microfractures in trabecular bone and hemorrhage on the synovial tissue, not initially mechanic instability, but the persistence of repeated microtraumas leading to inflammation, synovial hypertrophy, fibrosis and new bone formation, causing pain and mechanical instability, and meniscus lesion with the co-organization of hypertrophy and fibrosis develops this condition becomes serious with the development of osteophytes due to traction and forms focally in areas of early degeneration in the joint, causing soft tissue compression and limitation of movement[11,12].

## PHYSICAL AND CLINICAL DETECTION

Anterolateral impingement syndrome is one of ankle flexion and inversion injury takes place athletes be formed complicate with capsules tears of talofibular and calcaneofibular ligaments[13]. Lateral side of talus and tibia joint hemarthrosis and fibrinous debris in anterolateral gutter after trauma convert synovitis[5]. Synovitis formations pressure anterolateral dome during dorsiflexion causes pain and instability, thus, synovitis merge hyalinized fibrosis formation within anterolateral gutter manifest in sub-fasciculation of *talofibular* and *calcaneofibular* produce *meniscoid lesion* by anterolateral dome and front side of lateral malleolus[7]. The lesion typical transverse section namely meniscoid is related to compression in symptom of impingement syndrome during dorsiflexion, thus, cartilage lesion may see with repeated ground reactions in anterolateral talar dome, thus syndesmotic ligament complex after trauma in anterior gutter forms synovitis and meniscoid lesions[3]. In this case, low fibular adhesion of the ligaments predispose to anterolateral compression, the laxity of the ligaments and the resulting increased anterior translation of the talus relative to the tibial plafond may cause impingement symptoms caused by the fulcrum between the inferior fascicle of the talofibular ligaments and the anterolateral talar dome, in this reason capsule scarring or arthrofibrosis causes anterolateral impingement symptoms[11].

Occasional, ganglions are one of anterolateral impingement symptoms from anterolateral gutter[5]. Bone impingement symptoms of the anterolateral ankle are usually associated with bone spurs originating from the anterior edge of the tibial plafond, lateral to the midline, and below[3]. This type shock generally based on repeated loading intenses and ground reaction loading mechanisms in athletes[12]. The lower extension of the anterior tibial region, the plafond spur, may also cause anterolateral impingement symptoms as a result of impinging on the talar dome articular cartilage during plantar flexion in athletes[7]. Additionally, athletes have small cartilage delamination lesions in the tibial plafond next to the impingement spur, as well as the presence of anterolateral ankle pain[9]. The athletes primarily complaint to anterolateral ankle sensibility and swelling, however, their increased pain in ankle eversion and dorsiflexion movements[14]. In this case, ankle instability and peroneal tendon subluxation are detected with caution as they may mimic anterolateral impingement symptoms[4]. Indeed, although mechanic ligament instability is not occur, athletes perceived subjective instability, in this condition the compression of the distal fascicle of the anterior lower talofibular ligament creates a feeling of strain and occurs in the same situation in ankle dorsiflexion and eversion[15]. If the pain is severe, a highly sensitive and moderately specific maneuver is performed to detect anterolateral synovial compression, the two-handed maneuver involves grasping the hind-foot with the hand and applying pressure to the lateral gutter of the ankle with the thumb while changing the ankle from plantar flexion to maximum dorsiflexion[16]. The hypertrophic synovium in the anterolateral recess is forced into the joint by the examiner's thumb, thus intensifying the pain by compression of the ligament mass between the distal tibia and the neck of the talus in dorsiflexion.

## ANATOMY

Anterolateral gutter or recess of talocrural (ankle) joint is a triangular area[11]. Anterolateral gutter borders are form by tibia and posteriomedial fibula in lateral, anterior talofibular ligament in front, ankle capsule near in lower by calcaneofibular ligament and anterior low tibiofibular ligament in upper (Fig 1). The attachment location of the inferior fascicle of the anterolateral talofibular ligament on the lateral malleolus is variable, resulting in a change in the degree of inferior extension towards the anterior gutter[16]. Anterior gutter may contain some fluid in normal individuals. During ankle dorsiflexion, the anterolateral border of the talus protrudes towards

anterior gutter, displacing the native joint fluid[11]. The anterolateral recess of the ankle is bounded posteromedially by the talus and tibia, laterally by the fibula and anterior ankle joint capsule, and by the anterior tibiofibular, anterior talofibular, and calcaneofibular ligaments[17]. The syndesmotic ligaments of the ankle joint consist of the interosseous ligament, posterior tibiofibular ligament, and anterior inferior tibiofibular ligament[18]. The anterolateral talofibular, the weakest of the syndesmotic ligaments, courses obliquely and downward from the distal anterior tibia to the anterior aspect of the lateral malleolus[19].

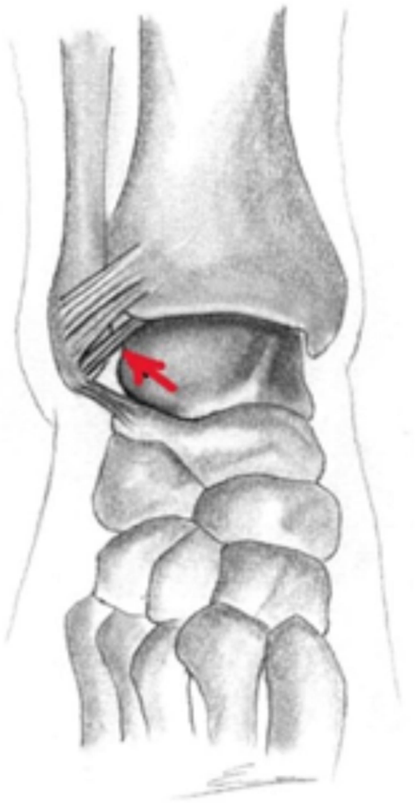

**Fig 1.** Anterolateral ankle formation; anterolateral gutter is area of ankle joint, anterolateral recess borders compose of tibia bone and posteriomedial fibula in lateral side of ankle joint. This gutter forms anterior fibular ligament in front, calcaneofibular ligament near capsule in lower and anterior lowered tibiofibular ligament in upper.

## PATHOLOGY

Anterolateral impingement typically results in ankle injury with forced plantar flexion and supination[18]. Clinically, anterolateral capsule rupture occurs without mechanical instability[17]. Functional instability and repetitive microtrauma resulting from post-traumatic soft tissue compression at the anterolateral ankle exacerbates soft tissue bleeding, synovial hyperplasia, and scar formation[2]. The anterior tibiofibular ligament normally contacts the anterolateral talus during ankle dorsiflexion and eversion[19]. Thus, in ankle dorsiflexion, there is no shift relative to the tibial plafond, thus the contact between the talus and the anterior tibiofibular increases[11]. Therefore, pathological compression of the anterior tibiofibular ligament is predicted in the context of anterolateral ankle instability[14]. The anterior tibiofibular ligament can become hypertrophic with sustained strain, exacerbating anterolateral impingement symptoms in a small subset of athletes[9].

## DETECTION

Conventional MR imaging provides little advantage over physical examination in the evaluation of anterolateral impingement syndromes in the absence of significant joint effusion[17]. Indirect MR arthrography, which exploits intra-articular diffusion of contrast, provides no benefit and is advantageous in the absence of native synovial effusion[20]. Detections evaluating the utility of CT21 and MR arthrography in the evaluation of anterolateral impingement syndrome have shown that the presence of nodular or irregular deep contour in the anterolateral joint capsule is strongly associated with scarring and synovitis[21]. Failure to stretch the anterolateral recess due to scarring is a highly specific but insensitive sign for anterolateral impingement syndrome and cannot be detected without arthrography[20,22]. It is accurate for the evaluation of soft tissue abnormality corresponding to scarring and/or synovitis in the anterolateral recess (Fig 2). Scarring and/or synovitis confirmed at arthroscopy[22]. Therefore, these pathological imaging findings must correlate with symptoms of anterolateral ankle impingement to be clinically significant[5,9]. Arthroscopic treatment method is advantageous in terms of shortening the recovery time and returning to sports activities earlier[21]. Conventional radiography is performed in the setting of subacute or chronic anterolateral ankle pain to evaluate for evidence of a possible prior fracture and subsequent complication (e.g., joint degeneration)[20]. Standard weight-bearing lateral radiographs are useful in the initial evaluation of anterolateral ankle impingement, and radiographs are used to evaluate the presence of both talar and tibial osteophytes as well as the tibiotalar joint space[6]. However,

radiographs cannot evaluate soft tissue pathology, but MRI is used to identify soft tissue pathology that may be causing anterolateral ankle syndrome[9]. Additionally, MRI allows the physician to make a potential differential diagnosis of osteochondral lesions and stress fractures[17]. Conventional axial T1-weighted images are useful to evaluate scarring in the anterolateral groove as well as hypertrophy of synovial tissue[21].

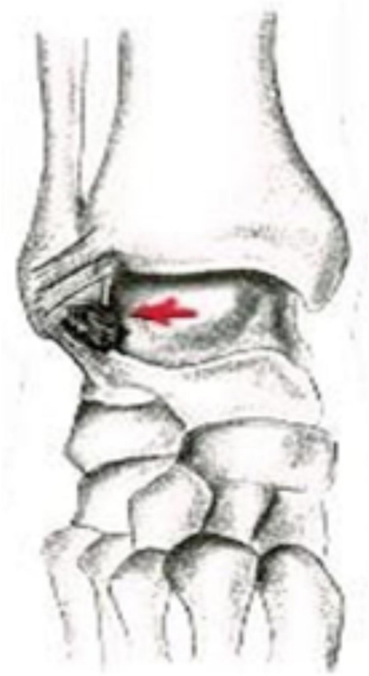

**Fig 2.** Anterolateral impingement syndrome causes scars and synovitis in anterolateral recess and soft tissues are abnormal hypertrophic ligaments.

## CLINIC PROPERTIES

Young people and those participating in sports activities often suffer from chronic ankle pain, limited dorsiflexion, and swelling show after activities[7]. A history of recurrent ankle inversion injuries may be present[14]. Pain tends to occur during ankle dorsiflexion, possibly with accompanying inversion or eversion[19]. The distinction between deep and superficial pain is important because deep ankle pain during weight bearing is typically associated with an osteochondral lesion[2]. The most important feature of this syndrome is the tenderness felt upon palpation of the anteromedial or anterolateral ankle joint line[16]. Another clinical diagnostic maneuver is the 'impact sign', which is positive when pain is produced by direct pressure on the anterolateral ankle with the foot in dorsiflexion[4]. However, a negative impingement test does not exclude anterior impingement, thus pain during plantar flexion may be due to stretching of the joint capsule over bony prominences[7]. Generally, pain in the anteromedial part of the ankle is caused by bone compression, and anterolateral ankle pain is caused by soft tissue compression[1]. Although diagnosis is primarily clinical, imaging can be useful for preoperative planning and differential diagnosis[15]. This condition may mimic osteochondral lesions, mechanical ankle instability, sinus tarsi syndrome, and rupture, subluxation, or tenosynovitis of the peroneal tendons[2].

## CONCLUSION

Definitely anterolateral impingement syndrome, rarely seen sublocation lateral syndrome can be observed, is an impingement syndrome that can be diagnosed and treated. However, the diagnoses and treatments that prove its existence have encouraged a primary injury in order to better understand the anatomical and pathological causes, so it was deemed necessary to report the reasons for its occurrence.

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**Conflict of Interest:** None

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