

Intra-articular pathologies associated with chronic ankle instability

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Abstract: Chronic ankle instability causes intra-articular lesions, which may lead to secondary degenerative changes. The aim of this study was to evaluate the usefulness of the ankle arthroscopy for the evaluation and treatment of intra-articular pathologies associated with chronic ankle instability. Between January 2013 and March 2016, 25 anterior ankle arthroscopies with modified anatomic Broström-Duquenois-Tourne lateral ankle ligaments reconstructions were performed. In arthroscopy all patients (100%) had some intra-articular pathologies: 75% synovitis or soft tissue scarring, 19% — deep chondral defect, 56% — superficial chondral lesion, 52% — osteophytes, 24% — bony or avulsion fragments, 20% — loose bodies. All intra-articular pathologies were treated during procedure. In conclusion, it is recommended to perform anterior ankle arthroscopy in addition to lateral ankle ligament reconstruction to diagnose and treat intra-articular lesions.

Key words: intra-articular, ankle pathologies, ankle instability, ligament reconstruction, retrospective study.

Introduction

Lateral ankle sprain is the most common injury in sports [1]. Inversion trauma of the ankle accounts for 45% of all injuries in basketball, and up to 31% in soccer [2, 3]. The majority of ankle sprains are treated conservatively, however, dysfunction can persist in up to 40% of patients for as long as 6 months following the injury [4, 5]. Repeated

inversion trauma leads to chronic ankle instability, which combines mechanical and functional deficiencies [6]. As a consequence development of posttraumatic ankle osteoarthritis is observed [7, 8].

The goal of the surgical treatment is to regain stability [9]. Procedures for treating chronic lateral ankle instability can be categorized into anatomic and non-anatomic tenodesis procedures. The most common anatomical technique is Bröstrom procedure [10]. In the literature, there is several modifications of this procedure [11–14]. One of them is anatomical reinsertion of the anterior talo-fibular and calcaneo-fibular ligaments described originally by Duquenoey [15–18].

Anterior ankle arthroscopy allows direct visualization of all intra-articular structures without an extensive surgical approach and arthrotomy [1]. The therapeutic indications include soft tissue injury [19], bony impingement [20], osteochondral defects [21, 22], arthrofibrosis, fracture, loose bodies [23], severe arthrosis requiring arthrodesis [24]. These lesions can be overlooked during routine examination and imaging studies [25–27].

The aim of this study was to evaluate the usefulness of ankle arthroscopy to diagnose and treat the intra-articular pathologies associated with chronic ankle instability.

Material and methods

Between January 2013 and March 2016, 25 patients were qualified for lateral ankle ligament reconstruction. Inclusion criteria were: chronic ankle instability with mechanical insufficiency of anterior talo-fibular (ATFL) or calcaneo-fibular ligament (CFL) after unsuccessful conservative treatment. The instability was diagnosed with physical examination by anterior drawer test and talar tilt test. Additional diagnostic tools were: standard antero-posterior and lateral weightbearing X-ray examinations and dynamic ultrasonography of the ankle joint. Exclusion criteria were: lack of mechanical instability in physical examination, severe arthrosis of the ankle joint and psychiatric disorders. After general or spinal anesthesia and inflation of the tourniquet each patients underwent anterior ankle arthroscopy as a first step of the procedure. Standard antero-medial and antero-lateral portals were applied and 4,3 mm, 30 degree arthroscope was introduced. All intra-articular structures were assessed. During the procedure all existing lesions were treated using shaver, vaporisator, curettage and other arthroscopic devices. At the end of the arthroscopy portals were closed by skin sutures and modified Bröstrom procedure was performed as a second stage. Approximately 6 cm skin incision was made from posterior edge of the tip of lateral malleolus longitudinally towards anterior process of calcaneus. ATFL and CFL were detached from their proximal insertion and plicated according to modified Duquenoey technique [9]. The ligaments were anatomically reinserted to the fibula by

sutures placed through two drill holes. In case of severe ligament insufficiency modified Gould reinforcement [14] or Tourne ligamentoplasty [28] was added. At the end of the surgery the skin was closed by interrupted sutures, tourniquet was deflated and shin splint with neutral position of the ankle was applied. This retrospective study was conducted in accordance with the principles and guidelines of the Committee on Publication Ethics (COPE).

Results

The average age of the patients was 35 years, ranging from 16 to 58 years; 10 were women, and 15 were men. The most common presenting symptoms were pain and instability of the affected ankle. Prior to the surgery all of the patients had symptoms of instability and discomfort during daily activities but only 80% of them had pain complaints. Anterior ankle arthroscopy revealed intra-articular pathological changes in all patients. Most of the patients (75%) had synovitis in lateral, medial or anterior gutter of the ankle joint, but only 40% of them had local synovial hypertrophy, which was excised using shaver or vaporisator during the procedure. 75% of patients had intra-articular scarring of soft tissue and 30% of them obvious anterior soft tissue impingement. In 19% of cases deep chondral defects of talar dome were detected and treated by debridement, curettage and microfractures. Softening and fibrillation of cartilage of talus and tibia were found in 56% of patients. 13 patients (52%) had bony impingement composed of osteophytes of anterior edge of tibia, medial and lateral malleolus or talar neck. Osteochondral loose bodies were removed in 5 arthroscopies (20%) and in 6 cases (24%) ossicles or avulsion bony fragments were excised. The average time of anterior ankle arthroscopy was 45 minutes. In one patient transient neuropraxia of superficial peroneal nerve was observed. In follow — up no other additional side effects were noted in comparison to patients after modified Bröstrom procedure alone.

Discussion

Intra-articular pathologies associated with chronic ankle instability can be diagnosed by magnetic resonance imaging (MRI) or ultrasonography [29]. Even though MRI is a valuable method in detecting the degree and location of osteochondral defects, it has low diagnostic value when it comes to soft tissue pathologies, e.g. impingement or synovitis [26, 30].

Ankle arthroscopy is a useful tool to directly visualize intra-articular structures and pathologies [1].

There is several studies in the literature concerning intra-articular lesions in chronic ankle instability. Taga *et al.* found chondral lesions in 29% of the acutely and in 95% of the chronically injured ankles [27], however there was a wide range

of cartilage damage in that studies [31–33]. Kibler found intra-articular pathologies in 83% of patients, including chondral injury (13%), loose bodies (13%), soft tissue impingement (26%), tibial or talar osteophytes (26%) and meniscoid lesions (15%) [33]. Ferkel and Chams described associated intra-articular problems in 95% of the patients: synovitis in 80%, adhesions in 50%, ossicles in 30%, loose bodies in 25%, osteophytes in 20%, osteochondral lesions in 19%, chondromalacia of the talus in 33% [34]. However, authors did not specify the degree of the chondral lesions of the talus. They suggested, that repair of intra-articular changes can give better results of treatment. The authors do not specify, whether all pathologies should be addressed [34]. Choi *et al.* did not observe correlation of clinical improvement with treatment of soft tissue and bony impingement [35].

DiGiovanni *et al.* retrospectively evaluated 61 patients who had undergone primary lateral ligament reconstruction with arthrotomies. He observed that all of the patients (100%) had some sort of associated ankle pathologies: synovitis in 49%, loose body in 26%, talus osteochondral lesion in 23%, anterolateral impingement lesion, peroneal tenosynovitis in 77%, attenuated peroneal retinaculum in 54% and peroneus brevis tendon tear in 25%. This study describes intra-articular pathologies detected through an open procedure. Extra-articular findings are very valuable and intra-articular seem to be underestimated. Lateral surgical approach limits ability to assess deep medial compartment of the joint. Ferkel and Cham stated in their study that only 20% of the intra-articular pathologies could be seen at the time of the open procedure [34]. Such retrospective studies enable to carry out a profound analysis of subjected cases and in our opinion is valuable examination.

Conclusions

Intra-articular pathologies are often associated with chronic ankle instability. It is strongly recommended to perform anterior ankle arthroscopy in addition to lateral ankle ligament reconstruction to diagnose and treat intra-articular lesions.

Conflict of interest

None declared.

References

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