

学 位 論 文 名 Evaluation of Anterior Talofibular Ligament Injury With
Stress Radiography, Ultrasonography and MR imaging

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著 者 名 Kazunori Oae, Masato Takao, Yuji Uchio, Mitsuo Ochi.

論 文 内 容 の 要 旨

INTRODUCTION

The ankle joint is frequently injured after a sprain, which commonly causes injury to the anterior talofibular ligament (ATFL). In general, the ankle sprain including the ATFL injury is treated conservatively. However, after conservative treatment in some cases there exists residual ankle disability, including persistent ankle pain, giving way, functional instability, and swelling. Therefore, it is important to diagnose ATFL injuries correctly. The purpose of this study was to evaluate the diagnostic value of Stress Radiography (stress X-P), US, and MR imaging in the assessment of ATFL injury.

MATERIALS AND METHODS

We prospectively studied consecutive 34 patients. All of them needed an operation because of severe problems such as osteochondral lesions, synovitis and instability. Patients with fractures have been excluded. The study population included 19 males and 15 females. The mean age of the patients at the time of the operation was 29 years (range, 13 to 55 years). There were 19 acute cases and 15 chronic cases. The physical examination was performed by one author. In all patients, stress X-P, US, and MR imaging were performed preoperatively. The images were

separately evaluated by *another* author. A reader of imaging had no knowledge of the patients' clinical history or the results of physical examination. After examinations, ankle arthroscopy was performed to confirm the diagnosis. Arthroscopy was used as the standard of reference.

RESULTS

On the bases of arthroscopic findings, 30 of the 34 patients had ATFL injury. The disruption was located at the attachment of the fibula (n=12), the mid-substance (n=9), and the attachment of the talus (n=9). Regarding a stress X-P, accuracy was good in chronic cases. In the acute cases, the accuracy was 53 % (10 of 19 patients) for the diagnosis of ATFL injury. In the chronic cases, the accuracy was 93 % (14 of 15 patients). The diagnosis of ATFL injury with US was made with an accuracy of 91%. In the acute cases, the accuracy of ATFL injury was 95% (18 of 19 patients). In the chronic cases, the accuracy was 87% (13 of 15 patients). The diagnosis of ATFL injury with MR imaging was made with an accuracy of 97%. In the acute cases, the accuracy was 100 %. In the chronic cases, the accuracy was 93% (14 of 15 patients). US and MR imaging demonstrated the same location of the injury as arthroscopy in 63% (19 of 30 patients) and 93% (28 of 30 patients).

DISCUSSION

The lateral collateral ligamentous complex is composed of the anterior and posterior talofibular ligaments (ATFL, PTFL) and the calcaneofibular ligament. Of these three structures, the ATFL is frequently disrupted in association with ankle sprains, and it is the most important clinically. In the present study, ankle arthroscopy was performed in all patients, and, thus, we were able to determine the sensitivity, specificity, and accuracy of stress X-P, US, and MR imaging in the diagnosis of the ligament injury. The stress Radiography can demonstrate the degree of laxity in the ankle joint. However, the stress X-P is difficult to perform for acute ankle sprains. We obtained a satisfactory result for the diagnosis of the ligament injury using US and

MR imaging. Furthermore, it became clear that the MR imaging is more specific tool than US to detect the location of the ligament disruption. The limitation of this study is that the evaluation of partial tears was not clarified. Arthroscopy is unable to diagnose the intraligamentous partial tear because it cannot detect the intraligamentous lesion. Furthermore, there is another limitation that the absence of a second reader of images. The images were evaluated by only one of the author. No test of intraobserver reliability was performed.

CONCLUSION

We could clarify the diagnostic value of stress X-P, US, and MR imaging in the diagnosis of the ATFL injury. We obtained a satisfactory result with US and MR imaging.