MRI Evaluation of the MTP Plantar Plates Compared with Arthroscopic Findings: A Prospective Study

Foot & Ankle Category: Midfoot / Forefoot

Author(s):
Daniel Baumfeld, MD
Caio Nery, MD
Michael J. Coughlin, MD

Introduction
Instability of the metatarsophalangeal joint has been widely reported and plantar plate may be the central of this pathology. The diagnosis is made clinically and can be enhanced by imaging studies. To enhance the diagnosis of this condition MRI is considered in the literature as the gold-standard tool but the sensitivity and accuracy of this method compared to direct vision of the lesions is not established yet. In this study we aim to identify the accuracy of the MRI on describing plantar plate ruptures when compared to a direct arthroscopy visualization using the Anatomic Grading System

Methods
Between January 2009 and June 2010, 35 patients were prospectively studied with MRI, arthroscopic view and surgical treatment of 62 lesser metatarsophalangeal joints. All patients had positive drawer sign in some degree and had preoperative MRI. Twenty-eight patients with instability of 55 lesser metatarsophalangeal joints met this criterion and were included in this study. We asked four radiologists to analyze the images. Two senior radiologists, fully trained and experienced in MRI analysis for more than 10 years, and two junior radiologists, senior residents. None of them was informed of the surgical findings or each other’s impressions. They were divided in two groups matching a senior and a junior radiologist on each group. Each professional received a set of CDs with the MRI images of all patients with no remarks of others. For the first group we presented a report sheet with a description of the types of plantar plate lesion (morphology, length, width) among the MRI plains. For the second group we presented a drawing with the Anatomical Grading System. Both groups were asked to report the morphology of the lesion on the plantar plate. All questions that they presented at that time were solved and no other information regarding the patient’s complaints, treatment’s choice or surgical findings was given. The reports of the first group were analyzed by one of the Surgeon who considered the descriptions of the radiologists and classified each lesion according to the Anatomical Grading System. The second group of observers reported the classification of each lesion according the Anatomical Grading System presented

Results
The anatomic grading shows improvement in the radiological evaluation, the knowledge of the classification by a radiologist helps to find and describe the type of tears of the plate. The time of training and the experience of the radiologist were also important findings in our study. The senior radiologists have had better levels of accuracy – group 1, 77.0%; group 2, 88.5%.

Conclusion
The prior knowledge of the pathophysiology and morphological types of lesions of the plantar plates is essential for correct identification and description of the tears by the radiologist