CASE REPORT

MRI Findings of Talocalcaneal Coalition: Two Case Reports

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ABSTRACT

Introduction: Tarsal coalition is abnormal fusion of two or more tarsal bones and is a common cause of foot pain. There are osseous, cartilaginous and fibrous subtypes. Calcaneonavicular and talocalcaneal coalitions are more frequent. Radiography is the primary diagnostic tool, however CT and MRI are precious examinations for differential diagnosis of osseous /non-osseous coalitions separations. Furthermore, cross-sectional imaging methods indicate the extension and secondary degenerative joint changes. **Case reports:** The detection of bone marrow of edema in the articulation area is valuable for diagnosis. Hereby, we present two cases, 24 years old female and 35 years old male, with the diagnosis of talocalcaneal coalition. We also discuss MRI and radiographic findings.

Key words: tarsal, coalition, subtype, talocalcaneal, osseous, non-osseous

1. INTRODUCTION

Tarsal coalition is abnormal fusion of two or more tarsal bones and classified as osseous, cartilaginous and fibrous subtypes (1). It has been determined in 1% of the general population and more and 90% comprises calcaneonavicular and talocalcaneal coalitions (2, 3). It is usually asymptomatic, however pain may be observed in adolescents or emerge with the increase in ossification. It may be related with the lack of differentiation and segmentation in the early stages of primitive mesenchymal development (4). It is slightly more common in men and is determined bilaterally by 50 % of the patients (3).

All types of coalitions can be detected by CT and MRI easily. The sections should be known by radiologists. In this report we discuss the two talocalcaneal coalitions (one osseous and one fibrous type) in company with MRI findings.

2. CASE REPORTS

Case 1: 35 years old male patient was admitted with chronic joint pain. Left ankle MRI was performed for examining arthritis. On MRI, talocalcaneal facet joint medial hypertrophy, narrowing and irregularities in joint space, irregularities on articular surfaces was detected. Also, fat-suppressed T2-weighted sequences showed that marrow edema in the calcaneal side. In the posterior talar side, there was degenerative subchondral cystic changes (Figure 1). It was considered that talocalcaneal coalition with these findings.

Case 2: 24-year-old female patient presented with pain and swelling in the left ankle. Left ankle MRI was performed for investigate arthritis or bursitis. T1 FSE (fast spin echo), fat-suppressed FSE T2 and GE (gradient echo) images were obtained. Subtalar medial facet hypertrophy, narrowing and irregularity at the joint space were observed. Subtalar joint space narrowing and degenerative osteophytes were ob-

served. In addition, bone marrow edema affecting a wider area of the calcaneus was observed (Figure 2). The findings were interpreted with talocalcaneal fibrous coalition. Osseous fusion was not found.

3. DISCUSSION

Subtalar joint, consists of anterior, middle and posterior facet. Talocalcaneal coalition, most commonly affects middle facet at the level of sustentacul tali (5). Diagnostic methods used in the tarsal coalition are radiographs, CT and MRI.

Radiography, anteroposterior lateral and 45 ° internal oblique position should be achieved. It can be difficult to detect talocalcaneal coalition with standard radiograms and often need a cross-sectional method. Therefore suggesting talocalcaneal coalition, secondary marks are defined on the radiographs. These are; talar beak, narrowing the posterior subtalar joint, rounding of the lateral talar process (5, 6, 7).

Lateur et al (8) defined 'C sign' as a sign that seen on lateral radiographs. Bean-shaped density is monitored and evaluated as a diagnostic for talocalcaneal coalition. This mark occurs as a result of bone bridging between the talar dome with sustentacul tali.

Harris axial radiographs which is taken 10 degrees of dorsiflexion of the foot in position by pressing the patient's X-ray cassette with a 45 degree beam angle, can be used in talocalcaneal coalition. However, cross-sectional imaging gives more information (9).

CT is superior in terms of diagnostic accuracy compared to radiographs in tarsal coalition (10). Talocalcaneal coalition with axial and coronal images can be displayed easily. Both of the foot inside the gantry should be symmetrical and displays should be obtained simultaneously at the both of the parties (1). The slice thickness should be 3 mm or less. CT is valu-

Figure 1. Talokalkaneal eklem medial fasetinde hipertrofi , eklem aralığında daralma ve eklem yüzlerinde düzensizlikler (ok) , kalkaneusta daha belirgin olan kemik iliği ödemi (*) izleniyor (a. Aksiyel T1-A görüntü b. Aksiyel T2-A görüntü c. Koronal yağ baskılı T2-A görüntü).

Figure 2. Subtalar eklem medial fasetinde hipertrofi (okbaşı) , eklem aralığında daralma ve düzensizlikler (ok) , subtalar eklem posterior kesiminde eklem aralığında daralma ve kemik köşelerde dejeneratif sivrileşmeler, kalkaneus ve talusta yoğun kemik iliği ödemi (*) izleniyor (a. Aksiyel T2-A görüntü b. Aksiyel yağ baskılı T2-A görüntü c. Koronal yağ baskılı T2-A görüntü).

able in the diagnosis and in determining the type of surgery to be applied and planning also (1). CT , gives much more information than radiograph about the width and extent of coalition (11, 12). Also accompanying degenerative changes can be easily detected. Talocalcaneal coalition are best detected in coronal sections (13).

In osseous coalition; a small piece of bone, bridges with the center facet of the subtalar joint. However, anterior or posterior facet involvement can occur.

In non osseous coalition; narrowing of the joint space and cystic reactive medium facet changes are monitored. Also it consists of hypertrophic changes in the underlying bone (14).

MRI images must be obtained in three plans: axial, coronal, and sagittal. FSE (fast spin echo) T1-weighted, proton density-weighted FSE, FSE T2-weighted images are usually sufficient to detect tendons, ligaments and joints pathologies. As in CT the coronal MRI is the best imaging plan for talocalcaneal coalition (1). In fibrous coalition, sagittal images show contour irregularities in the middle facet. Fat suppression with a series of coronal or sagittal plane, is useful in determining bone marrow or soft tissue edema and inflammatory changes (1).

In osseous coalition, bone marrow has the continuity at the articulation area (8). In the cartilaginous coalition, liquid or similar signal to the cartilage at the joint space is detected. Iso-hypointensity at the joint space can show the fibrous coalition (15). On MRI as well as in CT, the reactive periarticular bone changes occur. Proton density-weighted and

fat-suppressed T2-weighted or STIR (short time inversion recovery) images, show bone marrow edema along the articulation. These findings are helpful in detecting talocalcaneal coalition in patients undergoing MRI for an unrelated reason. Both of the cases described here had bone marrow edema.

Some authors believe that MRI is superior to CT in the fibrous coalition (13, 15).

4. CONCLUSION

As a result, due to the anatomy of the subtalar joint, to detect talocalcaneal coalition in radiography may be very difficult. Often need further investigation by CT or MRI. With these methods osseous / nonosseous coalition can be distinguished. Knowledge of anatomy and the warning signs allows the radiologist to recognize the pathology easily.

CONFLICT OF INTEREST: NONE DECLARED.

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