SPECT-CT versus MRI

in patients with hindfoot pain associated with foot and ankle disease

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NO CONFLICT TO DISCLOSE

< Single-photon emission computed tomography versus magnetic resonance imaging in patients with hindfoot pain associated with foot and ankle disease >

< Takao Aikawa >

My disclosure is in the Final AOFAS Mobile App.

I have no potential conflicts with this presentation.
**Background**

Foot and ankle pain is a diagnostic challenge because of the complex anatomy of the various bones and joints involved. **Bone marrow edema (BME)** is useful for diagnosing pain derived from bones. Recently, some studies have reported that single-photon emission computed tomography and computed tomography (SPECT-CT) is also useful for diagnosing osteoarthritis of the foot and ankle.

**Aim**

To evaluate SPECT-CT in comparison to magnetic resonance imaging (MRI) for diagnosing and interpreting hindfoot pain.
28 patients with hindfoot pain associated with foot and ankle diseases underwent MRI and SPECT-CT for bone scintigraphy.

- **29 feet**
- 15 male, 13 female
- Age 49.4 y.o. (11~77 y.o.)

**Ankle osteoarthritis** 18 cases

**Subtalar osteoarthritis** 4 cases

**AAFD** 4 cases

**Other diseases** 3 cases
To evaluate each imaging study, the lesions were divided into five regions:

**Ankle joint**
- ① Medial region
- ② Central region
- ③ Lateral region

**Tarsal sinus**

**Subtalar joint**
The BME changes observed on MRI were compared with focally increased tracer uptake observed on the SPECT-CT images at each regions.

**MRI : BME (+) / (-)**

Bone Marrow Edema (BME) : T2 fat suppression (stir) high and/or T1 low

**SPECT-CT : Activity (+) / (-)**

(bone scintigraphy)
Additionally, the findings at each tender area were compared to the imaging findings.

1. **Tenderness at medial side**
   - Imaging findings:
     - Ankle joint (medial region)
     - Subtalar joint

2. **Tenderness at central side**
   - Imaging findings:
     - Ankle joint (central region)

3. **Tenderness at lateral side**
   - Imaging findings:
     - Ankle joint (lateral region)
     - Subtalar joint
     - Tarsal sinus
**Results: Imaging findings**

- **15 feet**
  - BME (+), Activity (+)

- **26 feet**
  - BME (+), Activity (-)
  - BME (-), Activity (+)

(At least one region was positive.)
### Results: association with tender area and imaging findings

<table>
<thead>
<tr>
<th>MRI</th>
<th>Tenderness</th>
<th>Sensitivity</th>
<th>Specificity</th>
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<tbody>
<tr>
<td>(+)</td>
<td>20</td>
<td>55.6%</td>
<td>75.8%</td>
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<tr>
<td>(-)</td>
<td>16</td>
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<td></td>
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<table>
<thead>
<tr>
<th>SPECT-CT</th>
<th>Tenderness</th>
<th>Sensitivity</th>
<th>Specificity</th>
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<tbody>
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<td>(+)</td>
<td>31</td>
<td>86.1%</td>
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<tr>
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SPECT-CT is useful in localizing active arthritis especially in areas where the number and configuration of joints are complex.

In chronic medial knee pain

**BME vs Bone scintigraphic uptake**

Increased tracer uptake in bone scintigraphy (sensitivity 70%) is more sensitive for medial knee pain than BME on MRI (sensitivity 60%).


**In our study,**

SPECT-CT was more sensitive, but MRI was more specific in the evaluation of hindfoot pain.
Conclusion

✓ SPECT-CT provides additional information and was more sensitive for hindfoot tenderness.

✓ We believe that SPECT-CT can be a useful problem-solving tool for diagnosing hindfoot pain.

References