Joint space widening may be a paradoxical pathologic feature of early ankle arthritis.

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Disclosure

• NO CONFLICT TO DISCLOSURE

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• Our disclosures are in the Final AOFAS Mobile APP.
• We have no potential conflicts with this presentation.
Joint space widening may be a paradoxical pathologic feature of early ankle arthritis.

• Joint space narrowing?
  – Typical pathologic feature of ankle osteoarthritis.

• Joint space widening?
  – Never been discussed.
  – Some ankles showed joint space widening with bony spur.
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• Our hypothesis
  – Joint space widening is related with anterior subluxation of the talus and multiple bony spur.

• Purpose of this study
  – Investigate abnormalities in ankles with joint space widening by using radiographic studies.
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Materials and methods.

- Study design: Retrospective study.
- Control group
  - From September 2014 to August 2014
  - Took plain weight-bearing radiography and CT
  - Without ankle abnormality in radiographic study.
- Patient group
  - Spur excision between April 2009 and April 2014
  - Took plain weight-bearing radiography and CT
  - With joint space widening

<table>
<thead>
<tr>
<th>Diagnosis of Control group</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinus tarsi syndrome</td>
<td>25</td>
</tr>
<tr>
<td>Sprain of the foot or ankle</td>
<td>17</td>
</tr>
<tr>
<td>Accessory bone</td>
<td>7</td>
</tr>
<tr>
<td>Coalition</td>
<td>5</td>
</tr>
<tr>
<td>Flat foot</td>
<td>5</td>
</tr>
<tr>
<td>Asymptomatic contralateral side</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
</tr>
</tbody>
</table>
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- Define normal range of joint space width
  - Plain weight-bearing AP radiograph
  - 95% prediction interval in the control group = normal range

  Normal range of joint space width: 2.4 - 4.2mm

  ➔ Joint space widening: joint space > 4.2 mm
  ➔ Patient group including criteria

- Define anterior subluxation of the talus
  - Plain weight-bearing lateral radiograph
  - Measuring lateral talar station (LTS)
  - 95% prediction interval in the control group = normal range
  - Anterior subluxation of the talus = LTS > normal range
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- Investigate location of bone spurs
  - Three dimensional CT of ankle.
  - Count locations of spur – 4 areas

- Define ankle instability
  - Anterior and varus stress radiograph
  - Anterior ankle instability
    - Posterior joint space > 6mm in stress radiograph
  - Varus ankle instability
    - Talar tilt > 6° in stress radiograph
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- **Control group**
  - 73 ankles (63 patients) with no abnormality in radiographic studies (plain radiographs and CT)

- **Patient group**
  - 32 ankles (29 patients) with joint space width > 4.2mm

- **Ankle abnormalities which investigated in the patient group.**
  - Anterior subluxation of the talus
  - Location of bony spurs
  - Ankle instability
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1. Anterior subluxation of the talus in the patient group
   • Lateral talar station (LTS)
     – Normal range: -0.88 ~ 3.80 mm (95% prediction in control group)
     – Patients group LTS range: 3.91 ~ 10.66 mm

2. Location of bone spurs in the patient group
   • All patients have spurs on 4 areas
     – Medial, lateral, anterior, posterior
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3. Ankle instability in the patient group
   • Anterior instability: 31 ankle (97%)
     – One ankle which do not have anterior instability
     • Anterior instability blocked by anterior spur
   • Varus instability: 24 ankle (75%)

1. All ankles with joint space widening showed anterior subluxation of the talus.
2. All ankles with joint space widening showed multiple spur on all 4 sides of ankle.
3. 97% of ankles with joint space widening showed anterior ankle instability and 75% of the ankles showed varus ankle instability.
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Conclusion

• The joint space widening is a real pathology of ankle.

• The present study showed that the ankles with joint space widening commonly occurred with anterior subluxation of the talus, multiple spurs and ankle instability.

• The anterior subluxation of talus and ankle instability are cause of ankle arthritis, and bone spur is a typical pathologic feature of ankle arthritis.

• Therefore, joint space widening may be an early feature of ankle osteoarthritis.
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• Reference

