PedCAT for 3D-Imaging in Standing Position Measures Angles More Accurate than Radiographs or CT

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PedCAT for 3D-Imaging in Standing Position
Measures Angles More Accurate than Radiographs or CT

Martinus Richter

My disclosure is in the Final AOFAS Mobile App.

I have a potential conflict with this presentation due to:
Consultant Curvebeam
Radiological imaging foot and ankle

- **2D WITH** weightbearing (x-ray)
  - Feet dorsoplantar / lateral
  - Ankle ap (Mortise) / lateral
  - Metatarsal-skyline-view
  - Saltzman-view

- **3D WITHOUT** weightbearing (CT)
2D WITH weightbearing

• Dependent on projection

Same patient; different projection (central beam)
Introduction

Methods

Results

Conclusions

W ithout w/b TMT-11°

Same patient

With w/b TMT-22°
3D WITH weightbearing PedCAT
Radiation dose comparable with 6 digital radiographs and 5.6% CT

Ludlow et al.
Methods

• Prospective, consecutive study
• n= 30 patients
• Imaging
  - standard digital radiographs full weightbearing in standing position (feet bilateral dorsoplantar & lateral views, hindfoot view)
  - CT without weightbearing supine position (foot in neutral position)
  - PedCAT (feet bilateral) scan full weightbearing standing position
Measurement example pedCAT

- TMT dorsoplantar
- TMT lateral
- hindfoot angle
Time spent

Image acquisition

- Radiographs $902 \pm 70$ s
- PedCAT $270 \pm 44$ s
- CT $415 \pm 46$ s

- ANOVA, $p < .001$, post hoc all versus all $p < .01$
## Angles

### ANOVA X-ray vs. CT vs. PedCAT

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<tbody>
<tr>
<td>IM-angle</td>
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<tr>
<td>TMT lateral</td>
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<tr>
<td>Hindfoot angle</td>
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<tr>
<td>Calcaneal pitch angle</td>
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### Pos Hoc Scheffe Test

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pedCAT

• Image acquisition with pedCAT faster than with CT / radiographs

• Measured angles differ between pedCAT and CT / radiographs (except TMT dorsoplantar / calcaneal pitch angle pedCAT versus radiographs)

• Technically only pedCAT angles correct (CT without weight-bearing, radiographs with potential inaccuracies projection / position)

PedCAT potentially new standard for imaging of foot and ankle
References
