Combination of PedCAT with Pedography Shows Relationship of Morphology (Bone) Based Foot Center and Force/Pressure Based Center of Gravity

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Disclosure

Combination of PedCAT with Pedography Shows Relationship of Morphology (Bone) Based Foot Center and Force/Pressure Based Center of Gravity

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Richter M is consultant of Curvebeam and received stock options
Lintz F is consultant of Curvebeam

Our disclosures are in the FINALS AOFAS Mobile App.
We have no further potential conflicts with this presentation
Center of gravity (COG)

- Potentially important parameter
- Correlation with tibia axis, leg axis and hindfoot axis
- Influenced by foot deformities (for example flatfoot)
- Influence on forces / torque moments (for example TAR)
- Changes dynamically during stance phase of gait
- Principally function of "force"
- Pedography registers "real" COG
Foot center (FC)

- Potentially important parameter
- Influenced by foot deformities (for example flatfoot)
- Influence on forces / torque moments (for example TAR)
- Does NOT change during stance phase of gait
- Principally function of morphology (Bone shape and position)
- PedCAT registers real FC Correlation with TALAS software
**Methods (Technique)**

- Pedography sensor in PedCAT
- Simultaneous bipedal PedCAT / Pedography scan
Introduction

Methods

- Prospective, consecutive
- No control group
- \( n = 90 \) patients, \( n = 180 \) feet
- Superimposition FC (PedCAT) / COG (Pedography)
- Measurement distance FC / COG
- COGecification direction of potential distance
- Comparison R - L

Results

Conclusions
Introduction

Methods

Pedography

COG

Results
Introduction

Methods

PedCAT - TALAS

Results

FC
Introduction

Methods

Results

Conclusions

FC / COG Correlation

Examples
Introduction

Methods

Results

• Age 53.8 years (17-84)
• 57 (63%) female
• Distance FC - COG 28.7mm (0-60)
• FC distal to COG n=179 (99%)
  Distance 27.5mm (-15 - 50)
• Lateral or NO lateral distance
  n=147 (62%)
  distance 2,0mm (-18 - 20)
• R - L no difference (t-test, each
  p≥0.5).

Conclusions
Discussion / Conclusions

- COG NOT relevantly moving during PedCAT/Pedography scan
- Difference / distance between FC and COG as expected
- FIRST quantified
- Distance between COG and FC in the investigated 90 subjects / 180 feet (27.5mm distally and 2mm laterally on average)
- High variation
Discussion / Conclusions

- Data are a basis for prediction of COG based on FC without additional pedography
- Definition of COG might be taken into consideration for planning and followup for corrections/fusions around the hindfoot and for total ankle replacement
- Dynamic measurement in planning