The use of SPECT-CT in the Diagnosis and Surgical Decision Making for the Treatment of Muller-Weiss Disease. A Prospective Study

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Background: What is Muller Weiss Disease?

Compressed, and fragmented deformity of the navicular bone
(Muller, 1927; Weiss, 1929)

- Midfoot dorsal pain
- fixed rearfoot varus which is associated with pes planus
- “paradoxical pes planus varus”
- prominent navicular tuberosity
- talar head is at the midline of the dorsum of the midfoot
- short 1st metatarsal, plantar prominence of cuboid
Dilemma in Diagnosis & Treatment

- **Early stage cases**: minimal changes, difficult to diagnosis

- **Advanced cases**: extensive arthritis, severe deformity, difficult to distinguish the location of pain

- Which Joint should be treated? (talonavicular, talonavicular-cuneiform, triple)
You cannot make the decision of the type of surgical treatment only based on X-ray imaging

- We present the use of SPECT-CT in the diagnosis and surgical decision making in the treatment of different staged MWD cases
- SPECT-CT proved to have the advantages of accuracy, high sensitivity and specificity in early diagnosis as well as decision making of different stages of MWD over plain radiographs and CT scan
What is SPECT-CT and its Usage?

• bone scan (SPECT) + CT scan

• structural evaluation + functional assessment
  - deformity
  - early arthritis
  - high stress

SPECT CT scan in Muller Weiss disease is useful in:
  - diagnosis of early stage disease
  - decision making of treatment in advanced disease
Case 1 Early Stage Disease

- Female 50 yrs
- Midfoot pain for 1 year
- Radiographic examination: no positive finding
CASE 2  Advanced Disease

- Female 51yrs
- right midfoot pain for 10 yrs

• Severe navicular Sclerosis and collapse
• Obvious TN joint arthritis
• The NC joints are not involved
• therefore an isolated talonavicular fusion
CASE 3  Advanced Disease

- Female 58yrs
- right midfoot pain for 3 years

- Obvious navicular sclerosis and collapse
- severe TN joint arthritis
- The NC joints are not involved
- The CC joint is not healthy on SPECT CT
- therefore a triple arthrodesis selected
Case 4 Advanced Disease

- Male 48yrs
- Left midfoot pain for 5 years

TNC joint and CC joints are involved. Therefore triple + TNC arthrodesis
Case 5  Advanced Disease

- Female 48yrs, left midfoot pain for 3 years
- Based on CT findings, triple arthrodesis was performed
- The patient returned 1 year later with persistent midfoot pain
- SPECT-CT at 1 year followup visit showed NC joints are involved

NC joint should have been fused in the 1st surgery
References


4. Li S, Myerson MS, Monteagudo M, Maceira E. The use of calcaneus osteotomy for treatment of symptomatic Müller Weiss Disease. Foot and Ankle Int. (Submitted to Foot Ankle Int.)

Thank you!