

APOA Foot & Ankle Council Presents..

Case of the Month

March 2024



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Presented by:



Dr. Yeung Wai Lok, Charlix

Department of Orthopaedics and Traumatology
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Learning Points:

- © Goal of surgical treatment of Adult Acquired Flatfoot Deformity: Painless plantigrade, well aligned & stable foot
- © Preservation of motion segments in the surgical treatment is important to maximise the function of the foot
- © FiberTape® augmentation of the spring ligament may be reasonable treatment modality for flatfoot reconstruction

Title:

Adult Acquired Flatfoot Deformity Reconstruction with Spring Ligament Augmentation

Upcoming Case of the Month

April 2024

Presented by:

Dr. Yudha Manggala

Orthopaedic and Traumatology Surgery,
Faculty of Medicine Soegijapranata Catholic
University, Semarang, Indonesia



Title:

**Malunited ankle fracture:
how to tackle with**

Want to present a case? Write to...



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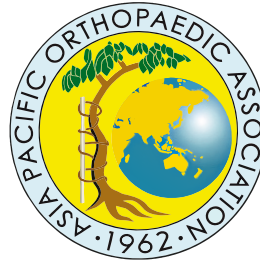
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Adult Acquired Flatfoot Deformity Reconstruction with Spring Ligament Augmentation

Dr. Yeung Wai Lok, Charlix

Department of Orthopaedics and Traumatology
Princess Margaret Hospital, Hong Kong, SAR

Introduction:

Adult Acquired Flatfoot Deformity (AAFD) is a progressive condition characterized by the collapse of the medial arch of the foot. This case presents the successful reconstruction of AAFD using spring ligament augmentation.

Case Presentation:

A 54-year-old female old age home staff, presented with a history of left foot pain for 7 years. She experienced progressive medial foot pain, flatfoot deformity, and painful callosity at the medial big toe. Walking tolerance was limited to 15 minutes, with a pain score of 6/10 on the Visual Analog Scale (VAS). Conservative treatments had failed to provide relief. The patient had no significant past medical history.

Physical Examination:

The patient demonstrated the clinical signs of collapsed medial foot arch, hindfoot valgus, midfoot supination, forefoot varus and abduction (**Fig. 1**). There was also callosity over the plantar surface of the big toe, positive "too many toes" sign, tenderness at the medial ankle region, and lateral ankle pain on standing. Additionally, there was a decrease in power of Tibialis Posterior, limited ankle dorsiflexion, and supple subtalar and midtarsal joint motion. Sensation and distal pulses were intact.



(Fig. 1)

Clinical photos showed the left foot deformities: Collapsed medial foot arch, forefoot abduction, hindfoot valgus, too many toes sign and big toe callosity

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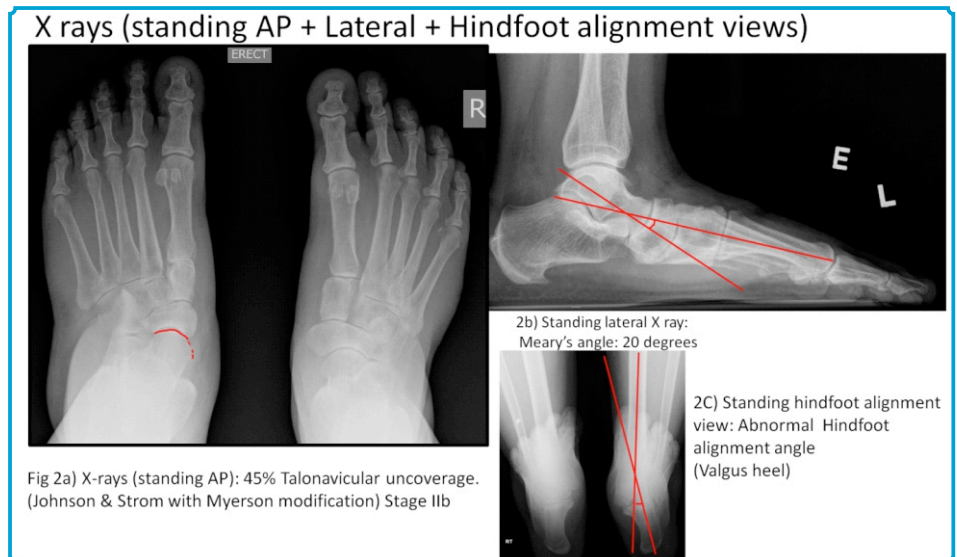
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Radiological finding:

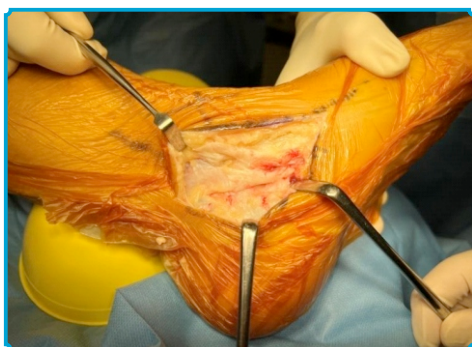
X-rays (standing views) showed abnormal Meary's angle, 45% talonavicular uncoverage. (Johnson & Strom with Myerson modification classification Stage IIb) and abnormal hindfoot alignment angle (valgus) (**Fig 2**).

MRI showed complete rupture of the left tibialis posterior tendon at 3.5 cm proximal to the insertion. The spring ligament was also torn (**Fig 3**).



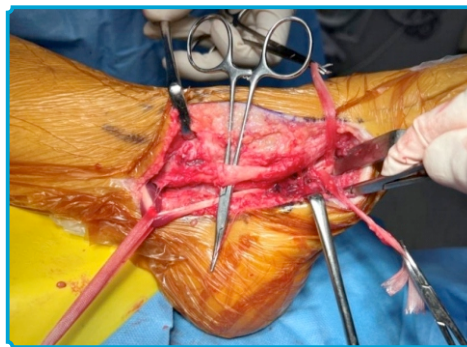
Surgical Procedure

The patient underwent operation. Intra-operative finding included complete rupture of tibialis posterior tendon. Endoscopic gastrocnemius recession, open flexor digitorum longus (FDL) tendon transfer, medial displacement calcaneal osteotomy, lateral column lengthening (Hintermann distraction calcaneal osteotomy) with iliac bone graft, as well as spring ligament repair and augmentation with InternalBrace FiberTape® (Arthrex) (**Fig 3**).



(Fig. 3a)

Posteromedial approach revealing the torn Tibialis Posterior



(Fig. 3b)

Tibialis Posterior and flexor digitorum longus (FDL) shown in the posteromedial approach

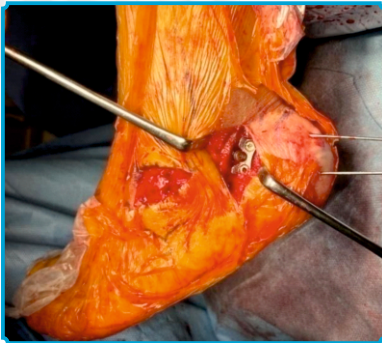
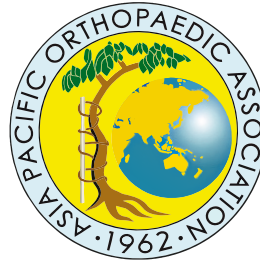


(Fig. 3c)

Complete rupture of tibialis posterior tendon with scar formation

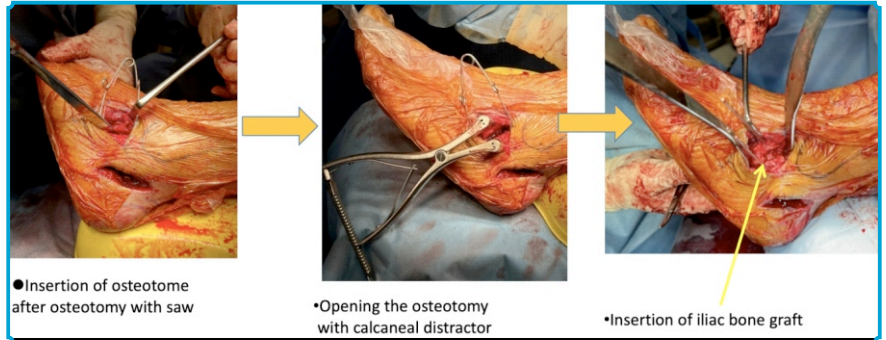
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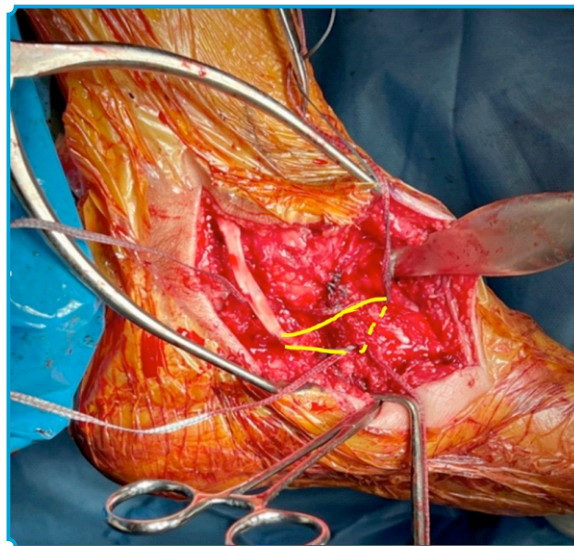
(Fig. 3d)

Medial displacement calcaneal osteotomy with fixation with plating



(Fig. 3e)

Lateral column lengthening with bone graft (Hintermann distraction calcaneal osteotomy)



(Fig. 3f)

Medial view of the foot: InternalBrace (FiberTape[®]) ligament augmentation of the spring ligament after repair (The yellow line showed the FiberTape[®] position after the Augmentation)

Post-operative Rehabilitation:

The patient was instructed to have non-weight bearing walking for 8 weeks, followed by partial weight bearing with an ankle brace for 3 weeks. Ankle range of motion exercises and strengthening exercises were initiated gradually.

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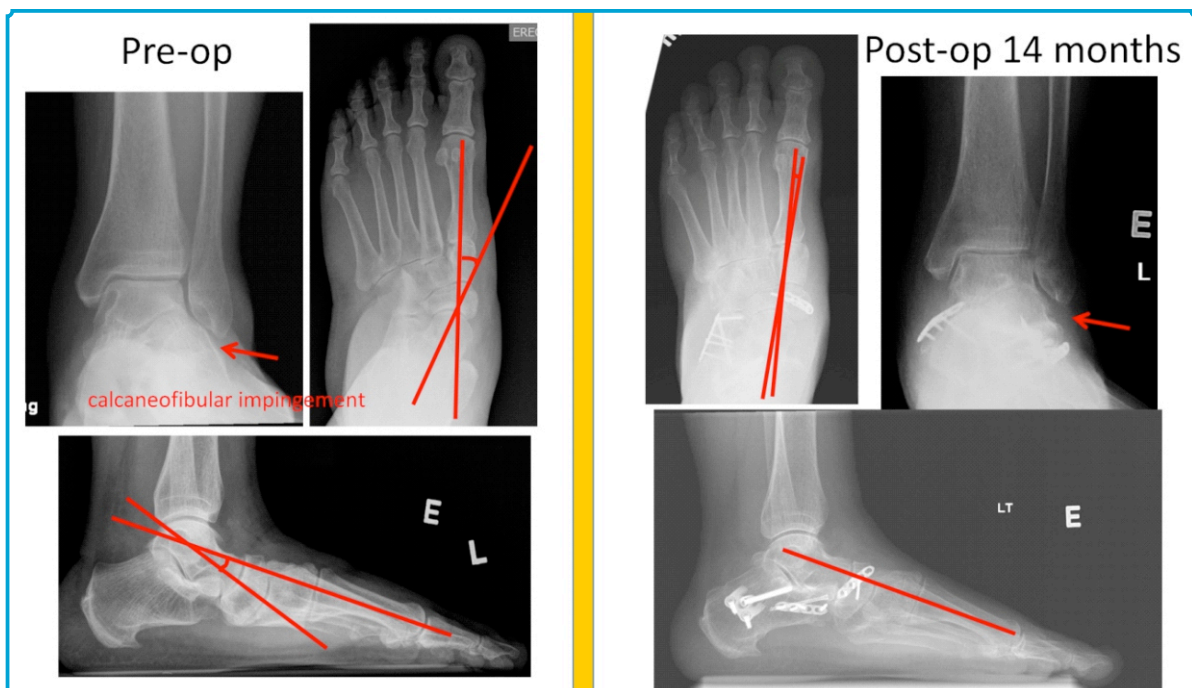
Latest progress

At 14 months post-op, the patient reported no significant pain and was able to walk unaided. Ankle dorsiflexion improved to 20 degrees, and plantarflexion improved to 40 degrees. Midfoot and subtalar motion remained supple (**Fig 4**). X rays at post-op 14 months showed the normal foot alignment.



(Fig. 4)

Photos at post-op 14 months demonstrating normal alignment of the foot. The deformities (Collapsed medial foot arch, forefoot abduction with too many toes sign, hindfoot valgus) were all corrected)



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Conclusion:

This clinical case highlights the successful reconstruction of Adult Acquired Flatfoot Deformity using spring ligament augmentation. The patient experienced significant pain relief, improved walking ability, and restoration of foot function.

Discussion about a Classification and Nomenclature

Adult Acquired Flatfoot Deformity (AAFD) is a complex condition that has been historically referred to by various names, such as posterior tibial tendon dysfunction (PTTD) or adult flexible flatfoot deformity. However, these terms do not always accurately describe the condition. In light of this, there has been a consensus group to rename it as Progressive Collapsing Foot Deformity (PCFD) in 2020, which is considered to better reflect the three-dimensional nature of the deformity [[1]](<https://pubmed.ncbi.nlm.nih.gov/32856474/>).

1) Classification and Nomenclature:

- The consensus group recommends renaming the condition as Progressive Collapsing Foot Deformity (PCFD)
- The proposed classification system for PCFD takes into account the varying degrees of hindfoot valgus, forefoot abduction, and midfoot varus
- Previous classification systems for AAFD have been incomplete or outdated, and a new classification system is proposed
- MRI findings are not considered necessary for the new classification system, but weight-bearing CT findings should be taken into account
- The new classification system should be used to stage the deformity clinically and guide treatment decisions

2) Treatment:

- The literature review did not provide a specific consensus on the treatment of PCFD. However, it discussed various treatment options and techniques that can be considered based on the individual patient's condition
- One treatment option mentioned is the use of a medializing calcaneal osteotomy (MDCO), which shifts the action of the Achilles tendon medially and can be effective in cases of isolated hindfoot valgus

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- Lateral column lengthening is another technique that can be used to address the deformity. The specific details of the osteotomy, graft choice, and amount of lengthening may vary depending on the patient's condition
- The literature review also compared the outcomes of different osteotomy techniques, such as the Evans osteotomy and Step-cut calcaneal osteotomy, and found similar outcomes in terms of union rates and functional scores
- Other treatment options mentioned include extended Z-cut osteotomy, fusion procedures, and arthroeresis (extraosseous talotarsal stabilization)
- AAFD is not always limited to adults, acquired, or a flat deformity, which highlights the need for a more accurate classification [[2]](<https://profiles.wustl.edu/en/publications/classification-and-nomenclature-progressive-collapsing-foot-defor>).
- The consensus is to rename AAFD as Progressive Collapsing Foot Deformity (PCFD) [[1]](<https://pubmed.ncbi.nlm.nih.gov/32856474/>).
- The new classification system for PCFD takes into account the three-dimensional nature of the deformity and includes hindfoot valgus, forefoot abduction, and midfoot varus [[1]](<https://pubmed.ncbi.nlm.nih.gov/32856474/>).
- Treatment options for PCFD include MDCO, lateral column lengthening, fusion procedures, and arthroereisis [[2]](<https://profiles.wustl.edu/en/publications/classification-and-nomenclature-progressive-collapsing-foot-defor>).

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