An Anatomical Cadaveric Study Comparing Medial vs. Plantar Approach for FDL or FHL Tendon Harvest for PTTD Reconstruction

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NO CONFLICT TO DISCLOSE

• “An Anatomical Cadaveric Study Comparing Medial vs. Plantar Approach for Flexor Digitorum Longus (FDL) or Flexor Hallusis Longus (FHL) Tendon Harvest for Posterior Tibial Tendon Dysfunction (PTTD) Reconstruction”

• Mena Abdelmalak

• My disclosure is in the Final AOFAS Mobile App.

• I have no potential conflicts with this presentation.
Background

• Current classic surgical treatment utilizes either the FHL tendon or FDL tendon to assist in the reconstruction of PTTD

• Tendon graft is then attached to the navicular
  • Either reattaching the tendon to itself or using a screw anchor
Current Approach

• Current common approach is to make a medial incision up to the level of naviculocuneiform joint and obtain the graft

• Problems:
  • Tendon grafts that are either
    • Too short in length to be secured onto themselves (tenodise)
    • Not long enough and requires to utilize a biotenodesis screw
      • Increasing the cost
  • Hard to tenodise the FDL distal stump to FHL which can cause a decrease in plantar flexion strength of toes
New plantar approach for obtaining the tendon graft

- First described in 2012 by Amlang et al. (FAI)
- Has the potential to take longer grafts
- Can decrease the cost as can decrease the use of a bioteneodesis screw
Purpose

- Compare the two tendons, the two approaches, and the two methods of attachment in order to determine if there is a more superior tendon, approach and method

- Determine if there is a benefit in utilizing the plantar approach in the tendon transfer for PTTD reconstruction
Methodology

- Ten fresh frozen cadaver feet
- All feet underwent both medial and plantar approaches (n=10)
- Single incision at the level of naviculocuneiform joint for FHL and FDL harvest
  - Both tendons marked to indicate their respective lengths at the incision site
- Second incision was created 1 cm posterior to the first metacarpophalangeal joint, utilizing a direct plantar approach
Methodology

• Both tendons were cut at the level of the incision with tendon connections
  • Medial Plantar Nerve presence noted on each specimen
• Extraction of the two tendons was done through the initial incision
  • Allowing for tendon harvest and inserted into a bone tunnel created in the navicular bone
• Each tendon was measured for length on judge if was able to be utilized in a full reattachment to itself (tenodise) or if it required a screw anchor (biotendesis screw) for fixation
Results

- When comparing the length of the two tendons, the FHL was significantly (p<.0001, n=10) longer than the FDL
  - Average increased length of 11.10 mm and 11.70 mm for the medial and plantar approach respectively
- When comparing the two approaches, there was a significant increase in length of both tendon grafts with plantar approach
  - Average increase in length being 40.60 mm and 41.20 mm for the FDL and FHL respectively
- No significant difference between the two approaches if the screw anchor method is utilized (p= 0.2105 for FDL and p=0.04737)
- However, if attempting to suture the tendon to itself, the plantar approach provided a significant difference with both tendons (p< .0001 for FDL and p=.0007 for FHL).
Results (cont.)

![Graph: Tendon Length Comparing Approaches](image)

- **FDL Length**
  - Medial
  - Plantar

- **FHL Length**
  - Medial
  - Plantar
Conclusions

• Based on the data, we conclude that utilizing the tendons from the plantar approach is more superior in PTTD reconstruction, whether the FHL or the FDL is used.
• It provides the greatest length of tendon to be utilized in the repair.
• It provides the highest likelihood for the tendon transfer without the utilization of a screw anchor.
• Tenodesis can easily be done in the plantar approach, and may provide better functional outcome.
• Plantar approach can decrease the cost as it does not prerequisite the use of a biotenodesis screw.
References


