Achilles Tendon Contracture After Calf Volume Reduction Neurectomy

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My disclosure is in the Final AOFAS Program Book and in the *Orthopaedic Surgeon’s Disclosure Program* database. I have no potential conflicts with this presentation.
Introduction

- Calf volume reduction surgery (from 1998 in pubmed)
  1. Botox injection
  2. Liposuction
  3. Partial gastrocnemius resection
  4. Selective neurectomy (from 1999)
  5. Radiofrequency ablation (from 2006)

- Clinical Application of localized motor nerve neurectomy
  > Controlling spasticity of gastrocnemius muscle
    - HS Kim et al., Am J Phys med Rehabil, 2002
    - WK Yoo et al., Yonsei Medical Journal, 2002

- Surgical Concept of Calf Muscle Reduction
  > Denervation induced muscle atrophy

FC Tai et al., Plast Recon Surg, 2008
YJ Park et al., Aesth Plast Surg, 2007
Introduction

- **Procedure Complications**
  - Standing and walking disturbance due to unexpected Achilles tendon contracture

- **Purpose of Study**
  - Analysis of etiology of iatrogenic Achilles tendon contracture
  - Evaluation of surgical treatment outcome
Materials and Methods

- 2009-2010
- 11 patients (M:F = 0:11)
- Average age : 27 (range 22 to 32)
- Bilateral involvement: 6 patients
- Total 17 cases

Preoperative Physical Examination
  - Ankle range of motion
  - Silfverskiöld test

Preoperative evaluation : MRI of both lower leg

Surgical Procedure
  - Gastocnemius release
  - Achilles tendon lengthening(Z-plasty, triple hemiresection)
Results

- Average symptom duration: 8 mos. (6-10mos)
- The average equinus angle:
  - -22 degree (range from -5 to -30)
- Silfversiöld test
  - Positive: 15 cases / Negative: 2 cases (total contracture)
- All patients have walking disturbances with standing difficulties
- Numbness or hyperestheisa on medial side of calf area: 4 cases
- Surgical procedure
  - Mini-open gastrocnemius release: 15 cases
  - Triple hemiresection: 1 case
  - Achilles tendon Z-plasty: 1 case
28 year old female patients both lower leg MRI shows high signal on bilateral gastrocnemius muscle with atrophy after receiving calf volume reduction procedure. This MRI patterns were common in all patients involved in this study.
Results

28 year old female patients shows positive Silfverskiöld test after receiving calf volume reduction procedure on her left leg and shows normal ankle range of motion after gastrocnemius muscle release.
1. Prone Position
2. Doppler ultrasound scanning for tracking the course of sural artery.
3. About 1 cm medial and lateral longitudinal skin incisions
4. Gap between sural artery and lateral incision > 2.0 cm
5. Dissection and splitting tendon and subcutaneous fat tissue of calf area

Preop. AOFAS : average 60.0
Postop. AOFAS : average 94.2
Patient satisfaction : 90%
Discussion

- **Calf volume reduction surgery**
  - The cases of calf volume reduction surgery for cosmetic reason is increasing.
  - Gastrocnemius contractures are reported after the procedure.
- **Price of calf volume reduction procedure**
  - 5,000 – 10,000 $ per both leg
- **Number of Cases in one clinic based on web search**
  - 3500 cases / about 500 cases per year
  - Unknown prevalence / incidence of complication
- **Mechanism of ankle contracture**
  - Horizontal volume reduction
    - cosmetic effect
  - Vertical volume reduction
    - gastrocnemius shortening
    - ankle contracture
- **Minimal invasive surgical treatment of gastrocnemius contracture**
  - Simple, safe and cosmetic procedure which can be done without expensive instrument as like endoscope.