Tendon transfers

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I Talkhani

- Replace the function of a tendon
  - Diseased
  - Inactive or
  - Ruptured

Principles of muscle-tendon units

- Correction of contracture
  - No tendon transfer can move a stiff joint.
- Adequate strength
  - Muscle will lose one grade of strength following transfer. Deceased muscle
- Amplitude of motion
  - Consider the amplitude of tendon excursion for each muscle.
- Straight line of pull
  - Most effective transfer, the muscle passes in a direct line. Desirable.
- One tendon, one function
- Synergism
- Expendable donor
  - Not significantly decrease the remaining function of the foot
  - Not create a deformity if return of function occurs following a nerve repair
- Timing of tendon transfer

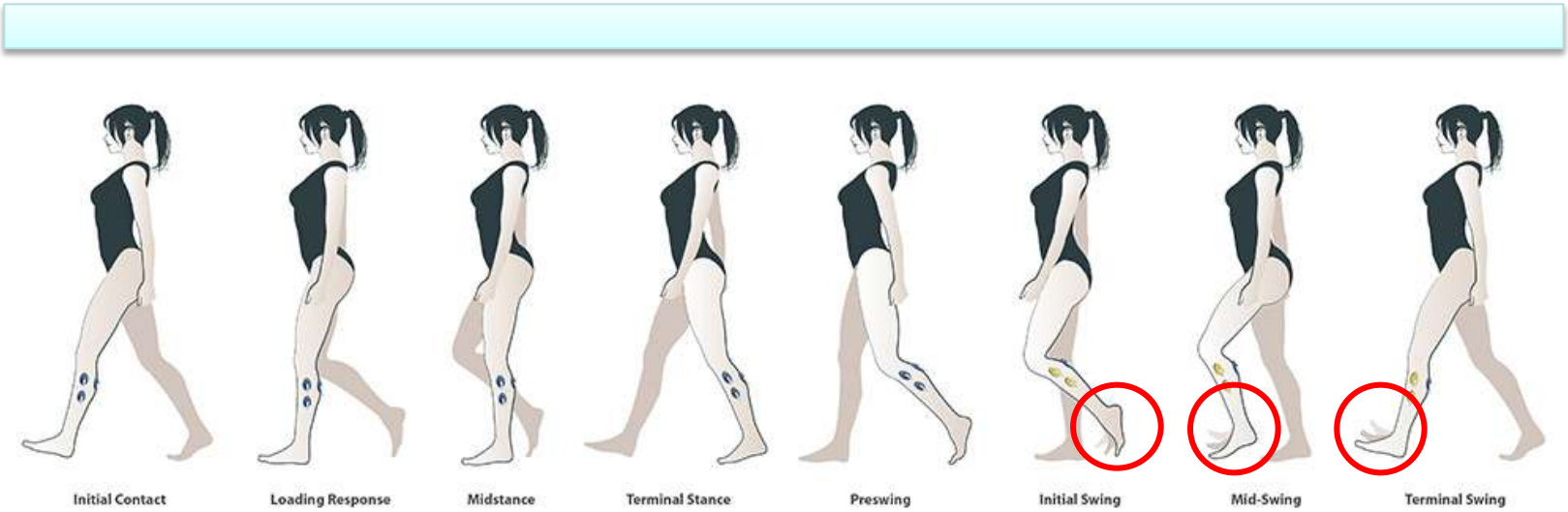
Foot and ankle practice

examples

- Traumatic ruptures
  - Tibialis - posterior rupture
  - Foot drop – common peroneal nerve
  - Late presentation of achilles ruptures
- Nerve palsy due to diseases
  - Polio
  - Hansen's
- Congenital / Genetic:
  - eg.Hereditary sensory motor neuropathies
- Deformities (Dynamic/Flexible)
  - Flat feet
  - Cavus feet

Foot drop

Foot drop


Initial Contact
Loading Response
Midstance
Terminal Stance
Preswing
Initial Swing
Mid-Swing
Terminal Swing
Foot contacts the ground
Plantarflexors Activated
EMG signal exceeds prescribed Activation Threshold to enable the unit
Stimulation off
Foot lifts off the ground
Plantarflexors Deactivated
EMG signal falls below the prescribed Deactivation Threshold
Stimulation automatically triggered to the dorsiflexors to lift the foot

Foot drop

- **Nerve lesions**
  - **sports injuries**
  - **diabetes**
  - **hip or knee replacement surgery**
  - **Long hours of abnormal pressure**
  - **childbirth**
  - **large amount of weight loss**

- **Brain or spinal disorders**
  - **stroke**
  - **multiple sclerosis (MS)**
  - **cerebral palsy**
  - **Charcot-Marie-Tooth disease (HSMN)**

- **Muscle disorders**
  - **muscular dystrophy**
  - **amyotrophic lateral sclerosis**
  - **polio**

Foot drop – Management of foot Drop

- MRI – look for tendon / muscle attenuation
- EMG – look for more proximal lesions
- Nerve injury
  - Acute – exploration
  - Late – tendon transfer
  - 18 months to 2 years wait
  - What procedure?

Chronic Achilles rupture

Chronic Achilles rupture FHL transfer

Flexible Planovalgus foot

Management Tibialis posterior desease

- Acute
- Chronic
  - Type I
    - Decompression + medial wedge
  - Type II & III
    - Tendon reconstruction and osteotomies

FHL transfer for tib post reconstruction

Cobb’s transfer

  - The tibialis anterior tendon is split,
  - Passed through the medial cuneiform or the tibialis posterior insertion,
  - Then through the tibialis posterior sheath attached to the tibialis posterior stump proximally.
- Gives a strong reconstruction better able to restore the arch
- Almost always medial displacement calcaneal osteotomy

Cavus foot

Flexible cavus foot surgery

- Hyperextended 1st MTPJ
  - Robert jones procedure
  - Peroneus longus transfer
- Midfoot cavus
  - Tibialis anterior transfer
  - Tibialis posterior transfer