Brachymetatarsia: Obtaining the Length You Desire!

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July 28, 2017
Objectives

- Understand the indications for treatment
- Be knowledgeable about the treatment options
- Be able to perform callus distraction for the treatment of brachymetatarsia
- Understand the complications associated with surgical treatment of brachymetatarsia
Brachymetatarsia

- Abnormally short metatarsal due to premature closure of the epiphyseal plate
- 5mm more proximal than adjacent mets on parabolic arc
Clinical Presentation

- 4-15 yrs of age
- Shortened or contracted digit
- Floating toe
- Pain
- Cosmesis → psychological
Surgical Treatment

- Metatarsal lengthening
- Toe disarticulation
- Syndactylization
Lengthening Indications

- Pain
- Inability to function
- Inability to wear shoes
- Complications distal or proximal to the deformity
- Psychological concerns
Metatarsal Lengthening

- One or two stage
- Gradual lengthening = Callus distraction
Tension-Stress Principle

- Stimulates osteoblastic activity by applying cyclic loading (tension) to bone
Technique

- Linear incision over metatarsal
- Blunt dissection
- Linear periosteal incision
- Ex-fix 2 pins distal & 2 pins proximal
- 0.045” K-wire
Technique

- Transverse osteotomy in diaphysis
- Distract, confirm w/ fluoro
- Compress (fluoro)
- Close with absorbable sutures
- Posterior splint
- Non-WB
Technique

- Latent 7 days
- Distract $\frac{1}{4}$ turn 4x/day
- Weekly x-rays
- Stop distraction when desired length, clinically and radiographically obtained
- Cast, repeat x-rays in 4 weeks
Callus Distraction

- Distraction = 0.25mm – 1mm / day
- Distraction = 2-4 turns / day
- Tendon “Z” lengthening
- Ex-fix left for ~ 1 month following bony consolidation
BV pre-op
BV
BV 2 wks post-op
BV 3 wks post-op
BV 4 wks post-op
BV 7 wks post-op
BV 9 wks post-op
BV 10 wks post-op
BV 5 mon post-op
IC R pre-op
IC R pre-op
IC R post-op
IC R 4 wks post-op
IC R 11 wks post-op
Pre vs Post
IC L post-op
IC L 6 wks post-op
IC L 8 wks post-op
IC L 2nd try
IC L 4 wks s/p re-do
IC L 10 wks s/p re-do
IC L 16 wks s/p re-do
Complications

- Neurovascular compromise
- Decreased MTPJ ROM / jamming
- MTPJ subluxation
- Non-union
- Angulation
- Pin tract infection
- Wrong metatarsal
- Over lengthening
- Fracture
Pre-op
1 mon post-op
3 mon post-op
5 mon post-op
5 mon post-op
2 months post-op
Summary

- Treat surgically when indicated
- Patient/Family must understand compliance and dedication to treatment
- Inform pt./family of possible complications
- Realistic outcomes
- Skill, Detailed post-op care needed for excellent results
- REWARDING!
Thank you!