

Developmental Orthopedic Disease - (DOD)

- *What is it?*
- *How do they get it?*
- *How do I evaluate/diagnose it?*
- *How should it be treated?*
- *What should I expect with treatment?*
- *Why treat it?*

DOD

Flexural Deformities

Contractural
Laxity

Osteochondrosis (OCD)

flaps (dissecans)
subchondral cysts

Phyinitis

Angular Deformities

varus
valgus

Wobblers

Brachygnathism

Why treat it?



Normal bone growth

- “Endochondral Ossification”
- Cartilage leads the way
- Maturation and differentiation from cartilage to bone

Foals are Plastic

- Growth influenced by:
 - nutrition
 - amount of weight bearing
 - our intervention
 - surgical



Treat the foal - Not just the problem

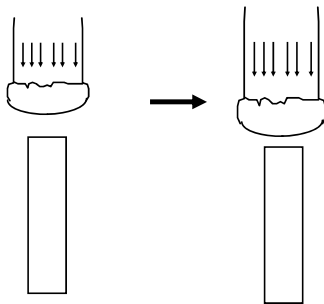
- Stabilization / support
- Exercise
- Medications
- Nutrition
- “Soft” vs. “Hard” tissue

Angular Deformities

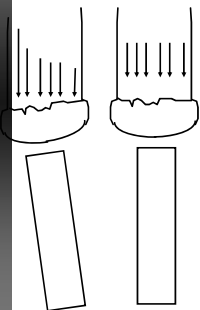
- “Crooked” Foal
- Limb distal to the joint
 - valgus or varus
- Carpus/Tarsus and fetlock



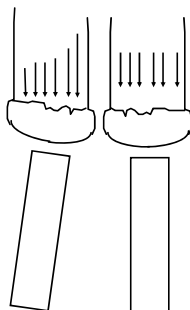
Growth vs. Deformity



Varus

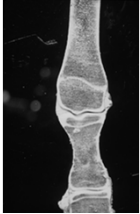


Valgus



Angular Deformities

- Asymmetric physeal growth



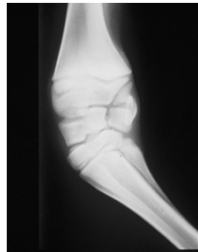
Angular Deformities

- Periarticular laxity



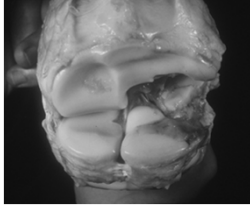
Angular Deformities

- Delayed/irregular ossification of cuboidal bones



Angular Deformities

- Delayed/irregular ossification of cuboidal bones



Angular Deformities

- Delayed/irregular ossification of cuboidal bones



Angular Deformities

- Excessive weight bearing



What is normal?

- Toe out
- Carpal valgus



Early recognition is critical

- Site of deformity
- Degree of deformity
- Potential for correction
 - shaping remaining growth



Determinants for our intervention

- Physical examination
 - Which joint, severity, precipitating cause
- Duration and Progression
- Previous “management”
 - Exercise, nutrition, any treatment
- +/- Radiographs

Expectations for the carpus

- Some valgus
- 5-7 degrees by 4 mths
- <2 degrees by 8-10 mths
- Most rapid growth < 6mths of age

Fetlock deformities

- Often undiagnosed
- Varus; left rear most common
- Rapid growth < 3 mths



Treatment options

- Conservative management



Treatment options

- External coaptation
 - Too much is BAD



Treatment options

- Limited External Coaptation



Treatment options

- Limited External Coaptation



Treatment options

- Conservative management
- External coaptation
- *Surgical intervention*

Surgical options

- Periosteal transection
- Transphyseal bridging
- Step osteotomy

Periosteal Transection

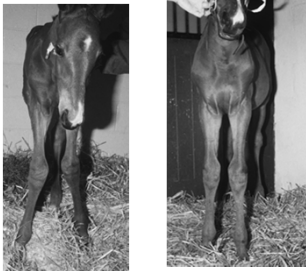


Auer J. Equine Surgery 1992; 947

Advantages of early periosteal transection

- Minimal risk
- No overcorrection
- Decreased cost
- 6-8 weeks of effect

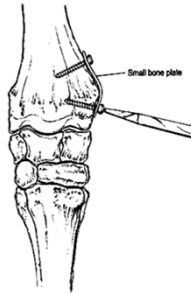
Periosteal Transection



Transphyseal bridging

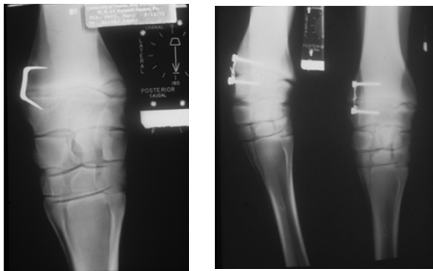
- Can overcorrect
- Requires 2nd removal procedure
- Increased Cost
 - 1st procedure + removal procedure
- But quicker resolution

Transphyseal Bridging

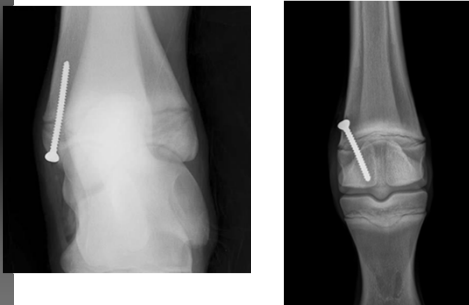


Auer J. Equine Surgery 1992:951

Transphyseal Bridging

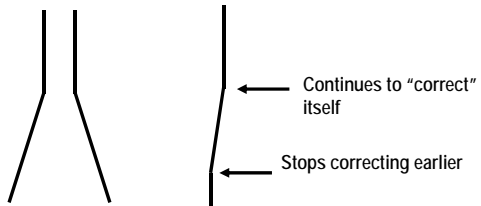


Transphyseal Bridging

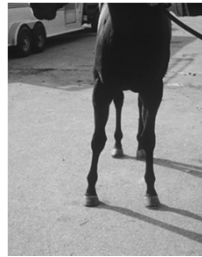
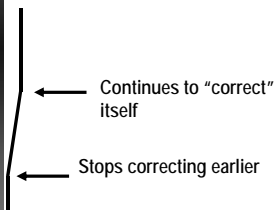


Surgical limitations

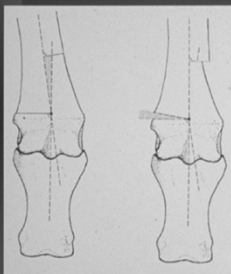
- 15-20 degrees for the carpus
- 6-8 degrees for the fetlock



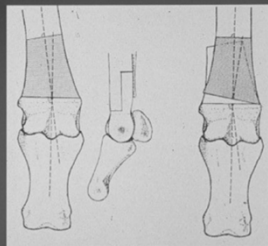
Surgical limitations



Step Osteotomy



Sagittal plane



Frontal plane

Flexural Deformities

- Contracture
 - congenital
 - acquired
- Laxity
 - primarily congenital



Contracture

- Bone outgrows tendons
- Flexors overpower extensors
- Pain-myotactic reflex
- “Contracted Tendons”

Sites of Contracture

- Coffin joint -



“Club Footed”



Sites of Contracture

- “Fetlock joint
- “Posty”
“Upright”



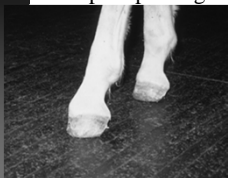
Sites of Contracture

- “Carpus - “Over”



Determinants for our intervention

- Physical examination
 - which joint
 - severity
 - precipitating cause



Determinants for our intervention

- Duration and Progression
- Previous “management”
 - amount of exercise
 - nutritional
 - any treatment

Nonsurgical management

- Limited exercise



Nonsurgical management

- Oxytetracycline
- Bandaging/support/splinting
- Analgesics



Nonsurgical management

- Bandaging/support/splinting



Nonsurgical management

- Shoeing:
- *Toe extensions????*
- *Heel elevations????*



Surgical management

- “Check” ligament desmotomies
 - cut the tether to allow greater flexibility
- Tenotomies
 - cut the attachment
 - severe cases - breeding animal

Inferior check ligament



Wagner PC. Current Practice Equine Surgery 1990:47.

“Club-Footed”

- < 4 mths of age
- Inferior check ligament desmotomy
- Shoeing with sx
 - toe extension



“Posty”

- 8-18 mths of age
- Superior and inferior desmotomy
- Shoeing?



Flexor laxity

- Coffin joint
- Fetlock



Flexor laxity

- Less is better



Flexor laxity

- Controlled exercise

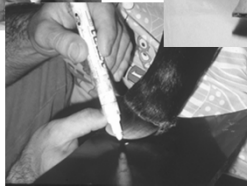


Flexor laxity

- Shoeing



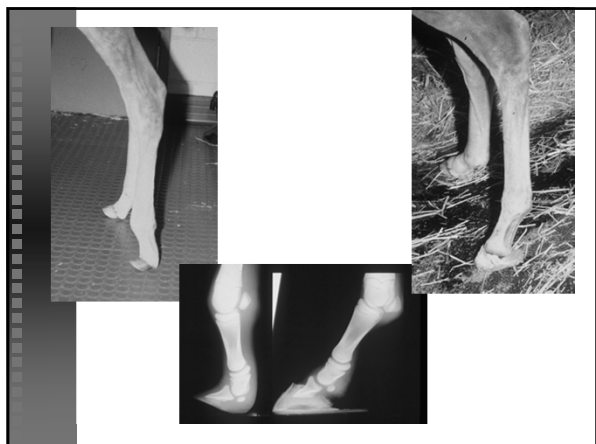
Flexor laxity



Flexor laxity

- Shoeing





Musculoskeletal Exam

- Palpation - often in recumbency
 - Heat
 - Pain
 - Swelling
 - Range of motion

Symmetry symmetry

Musculoskeletal Exam

- Observe at a walk / trot
 - More evident than adults
 - Sequential evaluations
- Radiographs
- Ultrasound

Critical to alleviate lameness as quickly as possible

- Angular / Flexural deformities can have a more significant effect than the primary problem

Sepsis

- Multiple joints or physes
 - Cultures
 - “Squeeze the bone”
- Source
- Often insidious onset
- Difficulty in interpreting radiographs

