Proceedings of the 13th International Congress of the World Equine Veterinary Association WEVA

October 3 - 5, 2013
Budapest, Hungary

Reprinted in IVIS with the Permission of the WEVA Organizers
managing angular and flexural deformities in young horses

prof tim greet frcvs
rossdales equine hospital
newmarket
tim.greet@rossdales.com

angular limb deformity

valgus - deviation of distal limb lateral to long axis of limb
varus - deviation of distal limb medial to long axis of limb

angular limb deformity

congenital or acquired

determining the site of angular deformity is critical

physis?

joint?

diaphysis or metaphysis?

combination?
clinical assessment of angular limb deformity

stand foal correctly on limb

look from in front and behind

walking

passive flexion of limb (farrier's eye view)

radiological assessment

stand foal correctly on limb

long or large plate

dorso-palmar/plantar view (latero-medial?)

beam centred on point of interest

lines to transect long bones

lines through physis

radiological appraisal can be misleading

look at foal!

cuboidal bone maturity?

cuboidal bone hypoplasia

carpus or tarsus
dysmature foal

protect limb in tube cast until ossification

value of physeal manipulation later?

**angular deformities may be complex**

there may even be several different deformities within one limb

**joint laxity in dysmature foals must be differentiated from a genuine angular deformity**

however prolonged joint laxity may lead to imbalance in physeal pressure with consequent development of an ald

**angular or rotational deformity?**

remember slight outward rotation is normal in young foals and will tend to disappear as chest broadens

if there is a major rotational component the prognosis is poor

oblique screws and wires?? no!

**offset cannon bones**

common

laterally offset at abc joint

no useful treatment
suggested greater incidence of carpal chips and condylar fractures

management of angular limb deformities

conservative approach

corrective farriery

periosteal manipulation - periosteal release

- transphyseal bridge

- shock wave therapy

wedge/step osteotomy

conservative approach

mother nature is extremely good at resolving angular deformities in newborn foals

unless there is a good reason for interfering it is best to treat all but the most severe deformities conservatively in the first instance

fetlock deformities require a more proactive approach

a good relationship with your farrier is very important in managing ALDs
regular inspection of young stock with veterinary surgeon

regular correct trimming every 2-4 weeks

remedial farriery when required usually first line of treatment in all but most severe cases

correct trimming

aim to return the hoof capsule to normal conformation ie to remove excess growth

valgus .... remove excess lateral hoof

varus ..... remove excess medial hoof

use of extension shoes

extension shoes

varus .... lateral (nailed, glued or acrylic)

valgus.... medial

better for carpus and tarsus than fetlock?

allows proximal bones to mature under better balance

not detrimental to hoof conformation cf excessive trimming

physeal manipulation

identify site of deformity
severity of deformity?

rotational component?

physeal activity (age)?

retard or stimulate?

**periosteal transection for correction of angular limb deformities**

auer jg (1982)

proc am ass equine pract 28: 223

**periosteal transection**

inverted “T” incision in periosteum on diaphyseal side of physis

(+/- elevation)

release of periosteal tension

stimulate physeal activity

periosteal elevation unnecessary?

cosmetic blemish?

**hemicircumferential periosteal transection and elevation**

easy and cheap

no special equipment

no implant removal (2nd ga)
no overcorrection

thus management more forgiving

slight short term blemish

re-operate?

**why not hcpt for all alds?**

deformity too severe (less effective)

too close to functional physeal closure (less time to be effective)

are we operating unnecessarily? (foals with respiratory or diarrhoea problems still straighten !!!)

does the operation work?

**temporary transphyseal bridge**

retard growth on convex side of limb

screws (4.5mm) and wire, staples or screw

risk of infection

careful postop monitoring (X-ray)

risk of overcorrection

implant removal (2nd GA)

expense
extracorporeal shock waves

used to retard growth on convex side of limb (medial in valgal deformity)

foals over 2 weeks old

andy bathe has reported on its use

average patient receives 3 treatments at weekly intervals (range 2-5)

claims ~ 90% success for ~ 50 treated cases

an option now for many moderately severe cases (instead of hcpt/e)

clinical scenarios

any bone / joint may be involved

commonly carpus, tarsus and fetlock involved

note that may be several sites

ironically these may compensate for each other leaving a relatively “straight“ limb

such cases may be better treated conservatively

“windswept foal”

in-utero position?

carpal / tarsal ...... valgus / varus

fetlock valgus / varus
multiple site surgery may be necessary

**normal foals should have a mild carpal valgus (2-5 degrees)**

a mild carpal valgus will disappear as the foal develops and its chest broadens

in newmarket we are very patient with foals with mild to moderate carpal valgus (up to 10 degrees)

if deformity greater than 10 degrees we will probably interfere

**literature**


carpal valgus conformation may be protective for carpal problems in training
(french flat racing tbs)

**carpal valgus**

periosteal transection or shock wave therapy for moderate deformities even up to 6 months of age; preferred much earlier at 6 to 12 weeks
(management of mare?)

more effective in younger foals

transphyseal screws (4.5mm) for most severe (>25 degrees)

**temporary transphysesal bridge for carpal valgus**

severity of angulation (> 25 degs)

if greater than 30 degrees risk of abrasion injury to incisions
(makes a single transphyseal screw a more attractive option)

cost

post operative management (mare / monitoring)

second general anaesthetic

**acquired carpal varus**

9-12 months of age

often bilateral

transphyseal bridge

lateral extension shoes

implant removal not critical (relatively slow change)

**tarsal valgus**

as for carpus but less common

transphyseal screw preferred to screws and wire

**metacarlo/tarsophalangeal joint**

typically hind varus

*urgent* correction (<12 weeks)

preferably 4 to 6 weeks

transphyseal bridge (time factor)
hcpte as well? no
proximal phalanx may also be involved
shock wave treatment may be valuable

**medial displacement of flexor tendons**

“bow string effect”
diaphyseal varus
osteotomy?
poor prognosis if severe

**complications of treating angular deformities**
misdiagnosis of site of deformity
rotational greater than angular component
failure to diagnose carpal or tarsal bone hypoplasia
distortion of hoof capsule by over-aggressive trimming
attempting to treat deformity when physeal activity diminished (fetlock)
over correction (transphyseal bridge)
cosmetic blemish (periosteal transection)
incisional breakdown after bridge insertion in severe bilateral carpal valgus
screw fracture when removing transphyseal screw

**technical errors**

preferable to screw radius and cannon bone from metaphysis to epiphysis

distal tarsus easier to screw from epiphysis to metaphysis

in this foal the screw was inserted distal to proximal and the original orientation was too axial

**transphyseal screw fracture**

distal radial screw

often when physitis and sclerotic bone

more likely with acquired carpal varus in weanling or yearling

**physitis and metaphyseal collapse**

(physitis and metaphyseal collapse much more likely with transphyseal screw than with screws and wire technique for distal radial correction

result of this is pain and lameness and the opposite angular deformity because of metaphyseal collapse ie varus becomes valgus or vice versa)

this complication may require surgical correction

carlson, Bramlage, stewart, embertson, ruggles and hopper (2012) equine vet j 44 416-9

**summary re angular deformities**
careful assessment

many cases will resolve without treatment or with help of appropriate farriery

*beware* of fetlock deformities because of rapid physeal closure (transphyseal bridge)

surgical management can be useful .... perhaps tendency to overuse?

anything to race better !!

shock wave therapy still being evaluated but probably useful

**flexural deformities**

congenital ..... *carpal ..... distal limb*

acquired ..... *dip ..... fetlock*

congenital lateral luxation of patella(e)

**oxytetracycline**

"panacea for all contracted foals"

3 g given intravenously

chelates calcium ions or MMP1 metabolism?

relaxation of musculotendinous unit

**carpal contracture**

newborn foal
the most severe can cause dystocia

most managed effectively by a conservative approach

more severe contracture may respond to section of ulnaris lateralis and flexor carpi ulnaris

the most severe may not respond to surgical release but can try incising the palmar carpal fibrocartilage (Bramlage).... I have had no luck with this

conservative management

support foal to suck if necessary

splints?

controlled exercise (avoid forearm fatigue)

ruptured common extensor tendon

synovial effusion of common digital extensor tendon sheath

typically no lameness

consequence of carpal contracture

always heals without treatment

flexor laxity in dysmature foal

minimal support to bulbs of heels and fetlock only if necessary

most recover with increasing maturity and strength
use of heel extensions to compensate for ddf joint function

**distal limb contracture**

usually more hind fetlock than foot

newborn foal

manage in cast (change every few days)

manage in splints (wired to toe)

remember foal skin is like tissue paper!

**splint or cast?**

cast provides more secure pressure on distal joints

more problematic to remove? ... no!

splints do not create as effective leverage for severe cases

splints much more effective if wired to toe

splints and light rjb more forgiving?

**splints**

cast limb then cut off cast and reshape

apply light rjb

incorporate splint and wire to toe in extension

**using casts**
relatively light bandage but foal sensitive skin so pad pressure points

cast in maximum extension

change or remove cast after 3 days

**acquired dip joint contracture**

so-called “club foot"

6 weeks to 6 months age

painful cause?

try analgesics and rest (heel wedge? ... gradually reduce height)

oxytetracycline

toe extension

rasp heels and rest or very light exercise

**carpal head DDF tenotomy**

under ga

rasp or trim heels to allow effect of release

gentle exercise

excellent prognosis

**extending the toe**
metallic toe extensions create huge pressure on the dorsal hoof wall
tendency for consequential hoof wall fracture in foals
most effective way is to provide metallic support of whole foot with acrylic or polymer support

**acquired metacarpophalangeal joint contracture**

12 - 24 months age
foot normally placed
rapid progression in some cases
proactive interference whenever possible
both sdft and ddft involved?

**surgical treatment**
aggressive and early
clinically seems both carpal head ddft & radial head sdft involved
section of both structures
aggressive physiotherapy
fetlock brace
poor outcome
flexor tenotomy for salvage?
problem
practical protocol

flexor tenotomy for salvage
both sdft and ddft
cast support
replace with rjb
significant risk of re-contracture after some months

lateral luxation of the patellae
newborn
miniature horses typically affected
flexural deformity of the stifle
diagnostic crouching stance

surgical release
section lateral patellar fascia (+- lat pat lig)
medial capsular imbrication
+- trochleoplasty
variable prognosis