


OHIO STATE COLLEGE OF VETERINARY MEDICINE

My Alpaca is Broke! Fracture Management in Camelids

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Camelids as Patients

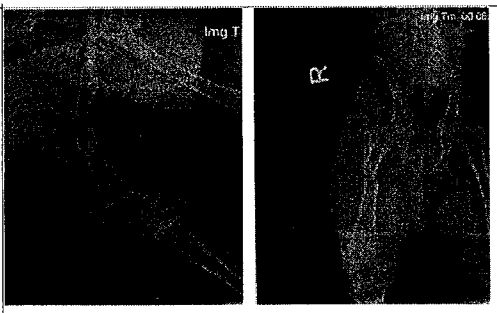
- Tolerate External Coaptation well
- Tolerate prolonged periods of recumbency
- Relatively low body weight
- Able to ambulate on 3 legs post operatively
- High Strung?



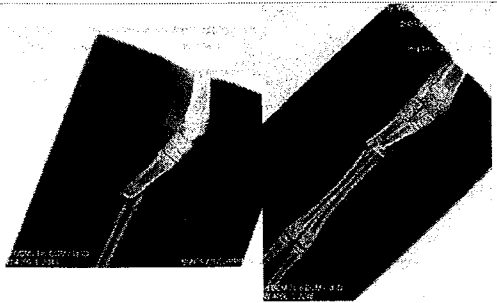
Considerations

- Location of Fracture
- Fracture Configuration & Comminution
- Health of the Animal
- Health of the Bone
- Open vs. Closed
- Age of the Animal
- Age of the Fracture
- Displacement of Fragments
- Joints or neurovascular structures affected?
- Value of the Animal

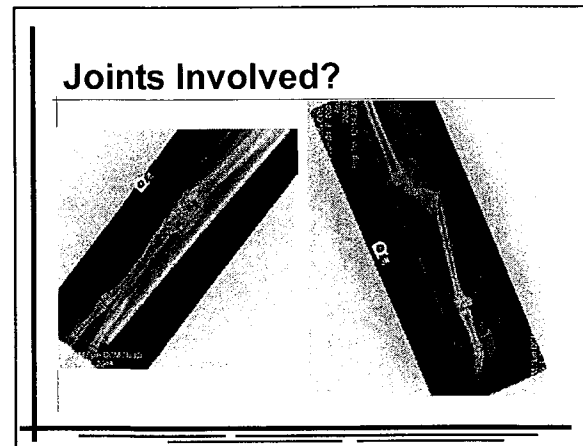
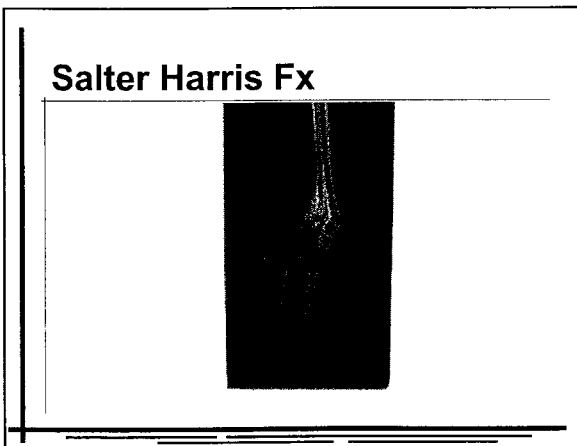
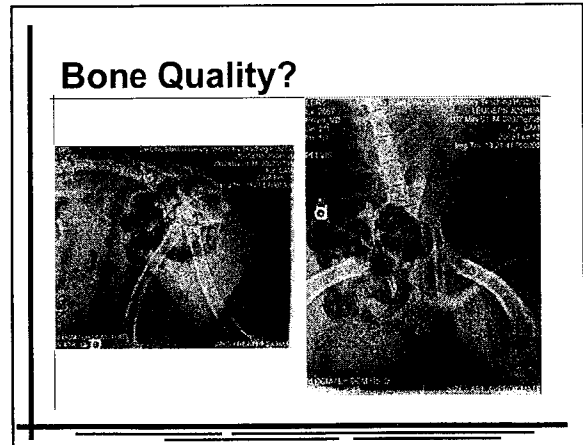
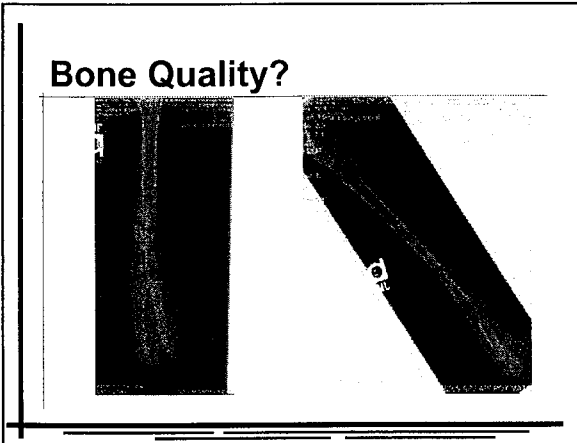
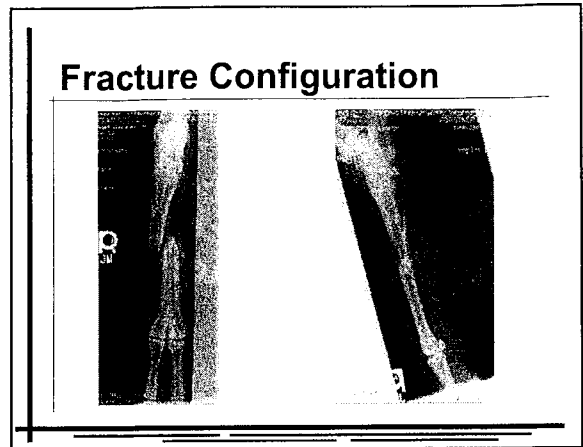
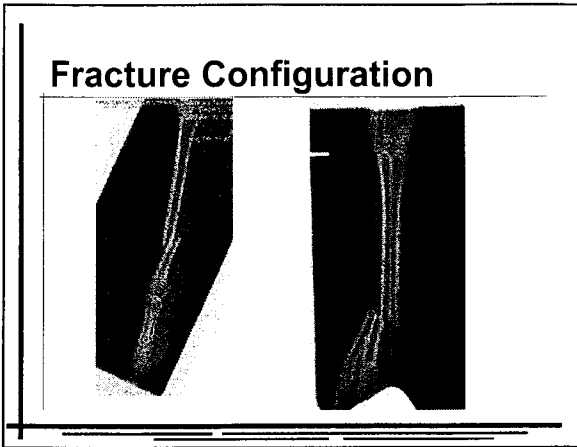
Fracture Location



Fracture Location



Humerus	n=6 (15.8 %)
MC/MT III/IV	n=5 (13.2%)
Femur	n= 6 (15.8%)
Tibia	n=5 (13.2%)
Radius & Ulna	n=4 (10.5%)
Mandible	n=2 (5.3%)
Others	n=10 (26.3%)



Joints Involved?



Emergency (On-the-farm) Treatment

- Goals
 - Stabilize the Patient
 - Keep **Live** animals from becoming **Dead**
 - Stabilize the Fracture
 - Keep **Closed** fractures from becoming **Open**
 - Prevent fractures from becoming worse
 - Prevent damage to neurovascular supply
 - Pain Management?
 - Some pain is good
 - Fix Fracture or Refer

Emergency Treatment

- History
 - Signalment
 - How did it happen?
 - Witnessed?
 - Physical Examination
 - Cardiovascular system
 - Pulmonary System
 - Globulins / IgG → Passive Transfer?
- WHEN DID IT HAPPEN?**
- } Shock?

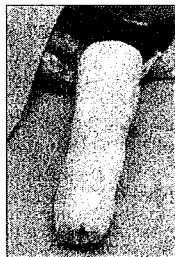
Shock Therapy

- Crystalloids
 - Balanced Electrolyte Solution
 - Hypertonic Saline?
- Colloids
- Whole Blood
- Neonates with FPT → Plasma prior to Sx

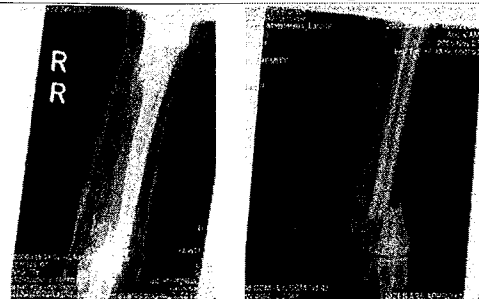


Temporary Fracture Stabilization

- Robert Jones Bandage
- Splints
- Casts
- Slings
 - Ehmer
 - Velpau
- Sedation



Robert Jones Bandage

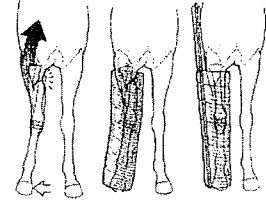


Splints

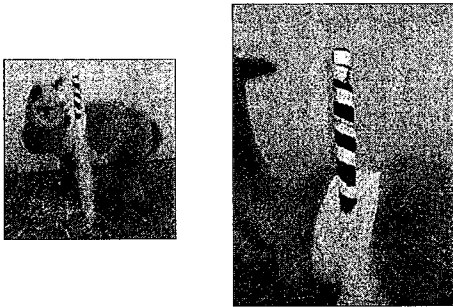
- Center the fracture within the splint
- Splint should extend at least a joint above and a joint below the fracture
 - Fractures above mid radius and mid tibia should not be splinted
 - "Fulcrum Effect"

Splints

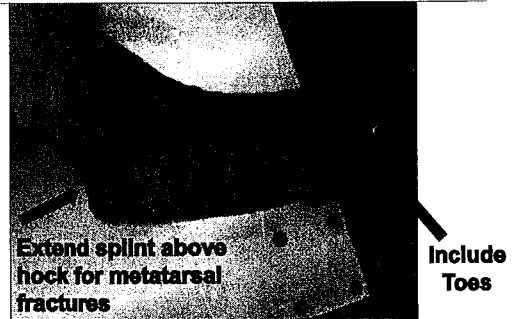
- Fractures of distal radius and tibia can be splinted
- Splint should extend to or above the shoulder or hip



Splints

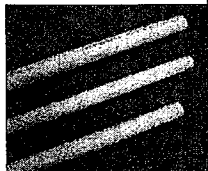


Insufficient Splint



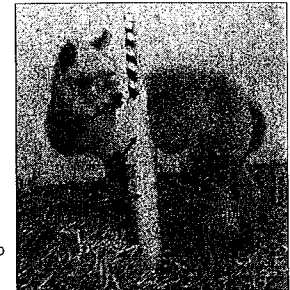
Splint Materials

- PVC pipe
- Wood
- Fiberglass Cast material



Splints

- Padded bandage applied 1st
- Splints applied over bandage
- Ideally 2 splints applied at 90° to each other
- Splints taped firmly in place
 - Splint migration is possible which can lead to "fulcrum effect"



Slings

- Prevent animal from using leg
- Velpau – Front leg
 - "Velpau for the Elbow"
- Ehmer – Hind leg
 - "Ehmer for the Femur"

Chemical Restraint

- Xylazine
 - 0.3 mg/kg IV (alpacas)
 - 0.2 mg/kg IV (llamas)
- Butorphanol
 - 0.05 mg/kg IV
 - 0.1 mg/kg IM or SQ
- Is pain protective?

Radiographs

- Lateral and DP views
- Oblique views can be helpful
- Splints can provide stabilization during radiographs
- Sedation

Fracture – Mgt. Options

- Conservative Therapy (Stall Rest)
- Casts / Splints
- Schroeder – Thomas splints
- Transfixation Pin Casts
- External Skeletal Fixation
- Internal Skeletal Fixation
- Amputation
- Euthanasia

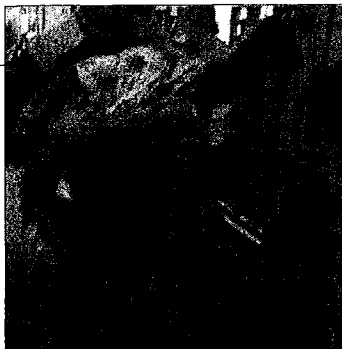
Conservative Therapy

- Proximal limb fractures are not amenable to casting
 - "Fulcrum Effect"
- Proximal limb fractures are inherently more stable due to stability provided by large muscle masses
- Stall Rest in well bedded box stall
- Analgesics
 - Is pain protective?

CASTS

How far to cast?

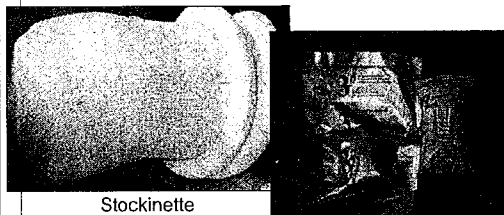
- A joint above and a joint below the fracture
- Fractures of distal metatarsus / metacarpus or below
 - Half limb casts
- Fractures of the proximal metatarsus / metacarpus
 - Full limb casts



Prevent Cast Sores

- Stockinette
- Use adequate padding
- Don't use too much padding
 - Too loose is as bad as too tight
- Extra padding around pressure points
 - Accessory carpal bone
 - Calcaneous
 - Talus
 - Proximal sesamoid bones

Cast Padding



Stockinette

3M Custom Support Foam

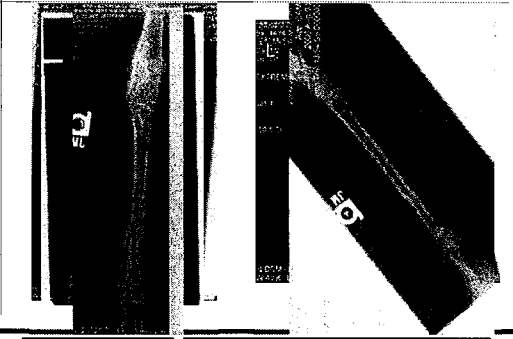
Cast Material



Transfixation Pin Cast

- Transcortical pins placed through the bone proximal to the fracture
- Pins transfer the animal's weight to the sidewalls of the cast
- Pin placed distal to fracture?
- Can fix more proximal fractures than with standard casts
 - Ideally cast is extended proximal to the pin
 - Pin site fractures possible

Transfixation Pin Cast



How long can I leave the cast in place?

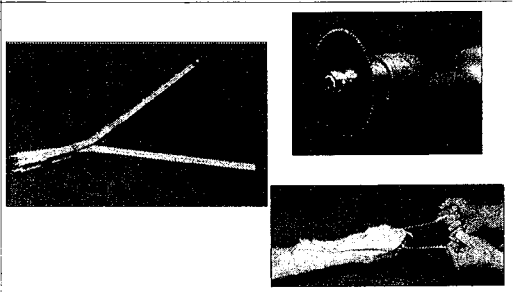
How long to leave cast on?

- Juveniles – 4 to 6 weeks
 - Rapidly growing animals may need more frequent cast changes
 - Physeal fractures heal faster than non-physeal fractures
- Adults – 8 to 10 weeks
 - Soft tissue damage can affect healing
- Drastic increase in lameness warrants removal

Too long in Cast



Cast Removal



Cast Complications

- Fracture Instability
- Inadequate reduction
- Cast Sores
- Infection under cast
- Tissue strangulation



Schroeder – Thomas splints

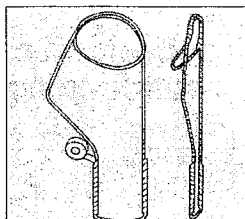
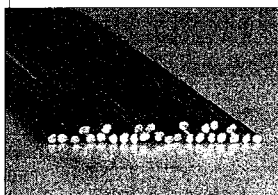
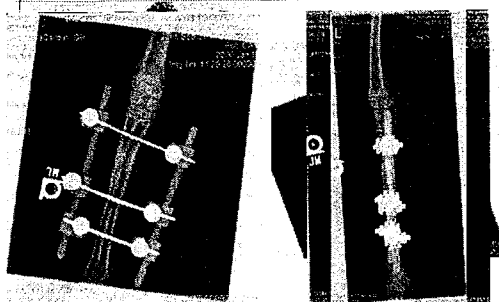
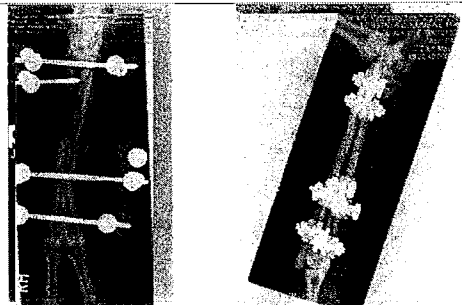


FIG. 197. A pelvic limb Schroeder-Thomas splint. The finished splint is shown with fastened elastic girdle ties. Tape is applied to keep the traction members from slipping.

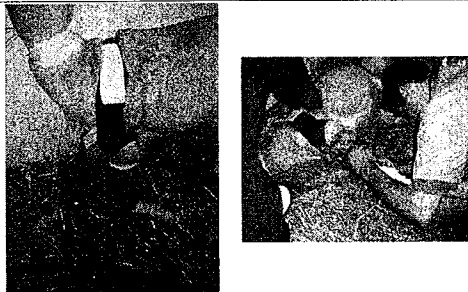
External Skeletal Fixation



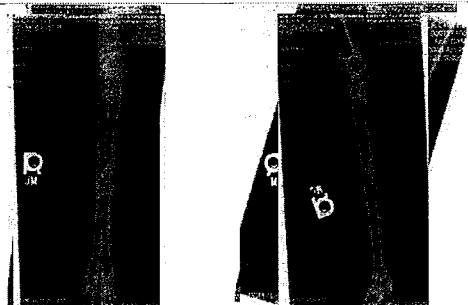
External Skeletal Fixation



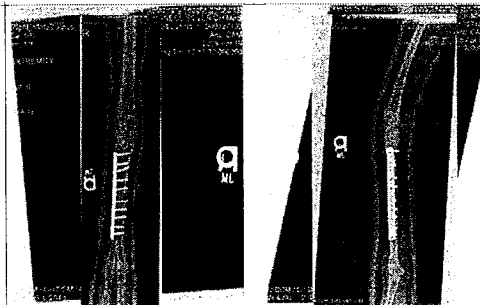
Ring Fixator



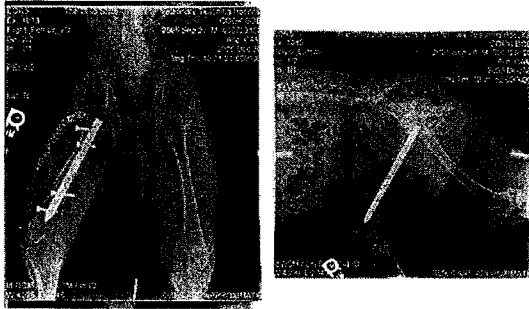
Bone Plate



Combination Therapy Plate & Cast



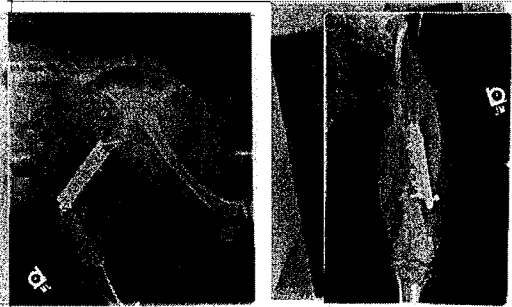
IM Interlocking Nail



Complications Implant Infection



Complications Fixation Failure



Amputation with Prosthesis

