STEP BY STEP
FRACTURE MANAGEMENT

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Introduction

- Fracture is considered an immediate emergency in horses
- Prior to surgery:
  - Immobilisation
  - Soft tissue protection
  - Superficial wound management

Evaluation:

Two steps:

1. Clinical examination (heart rate, rectal temperature, shock evaluation)
2. Imaging - radiology, CT and MRI

Most frequent: X-ray

Decission making: EUTHANASIA VS THERAPY

Key points in discussion with the owner:

- Risk of complication
- Cost
- Percentage of recovery/ function/ return to sport
- Age is a risk factor
- Weight is a risk factor (Body condition score)

Fracture types

1. epiphyseal/ diaphyseal
2. complete/incomplete
3. in green wood
4. joint etc.

Weight -> 70% recovery rate in diaphyseal fractures up to 400 kg

- Economical and emotional value (sport horses, pleasure horses, ”kids/wife horses”)

- The necessary time to recovery -> months/years
  - Return to initial activity depends
  - Functional for reproduction, hobby, companion etc.

END GAME/EUTHANASIA

Euthanasia if:

1. We have an open wound, with a lot of devitalised fragments

2. Nerves or high caliber vessles are affected

3. Fracture is epiphyseal with both articular epiphyses involved

4. there are secondary organic lesions eg.: splenic rupture, spine compression, pulmonary lesions

5. The owner does not possess of the finances to sustain surgery and/or long term recovery

TREATMENT STEP BY STEP

The ideal treatment follows the next steps:

1. Sedation
2. Wound management
3. Infection prophilaxys
4. Analgesia
5. Fracture fixation and mobilization
6. Intravenous fluid therapy
7. Safe transportation

SEDATION

- Sedation is recommended for better muscle and tendon relaxation – better coaptation
- Take into consideration: weight, age, temperament, type and location of fracture
- A good option: alpha 2-agonists + opioids

Xylazine, 0.5-1.1 mg/kg

Detomidine, 0.03 mg/kg

Butorphanol, 0.01-0.04 mg/kg and morphine, 0.05-0.1 mg/kg.

WOUND MANAGEMENT

1. Hair removal - shawing machine woth a small size blade
2. No razor blade shawing
3. Sterile gauze
4. Clorhexidine or betadine soap followed by alcohol and betadine

INFECTION PROPHILAXYS

It is mandatory !

For closed fractures with minimal trauma Penicilline, Streptomicine and Gentamicine (broad spectrum)

For complicated fractures, susceptible to infection -> Cephalosporines are recommended

PAIN MANAGEMENT

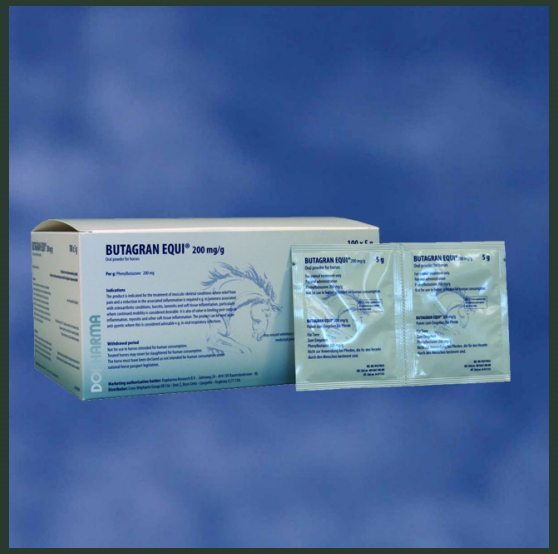
Pain management is an important step in fracture treatment.

Sedatives have a reduced analgesic effect, that is why they need to be supplimented with nonsteroidian anti-inflamatory drugs (NSAIDs)

Flunixin meglumine – 1.1 mg/kg (Niglumine, Norflunix, Fynadine)

Phenylbutazone – 2-4 mg/kg (Butagran, Phenylartrine)

Equioxx – oral paste/injectable 0.1mg/kg – **foal !**



FRACTURE IMMOBILIZATION

- SOLID IMMOBILIZATION
- TWO JOINTS IMMOBILIZATION – above and under the fracture line

1. Sterile gauze
2. Cotton – to avoid soft tissue trauma
3. Elastic bandage for compression
4. cast

FRACTURE IMMOBILIZATION OF THE PHALANX

- KIMZEY splints
- it is mandatory to minimise traction on the deep digital flexor tendon

- If Kimzey splint is not available , alternatively a 5-10 cm batten can be used, secured with an elastic wrap at the level of the heel (the same elastic wrap is used upwards to compress the rest of the leg)

- Next layer – thick cotton layer/ absorbing
  - Knee level
- Wood splint protectted with cotton on both ends
- Elastic bandage 10-15 cm width
- Protective layer – vet wrap

! alternatively casting can be done after heel elevation !

IMMOBILIZATION OF THE 2ND AND 3RD PHALANX

- MIDDLE OF METACARPUS/METATARSUS
- CAST
- INCLUDING THE HOOF

IMMOBILIZATION OF A METACARPAL FRACTURE

- SAME TECHNIQUE
- CAST
- From hoof to upper third of the tibia for posterior limb

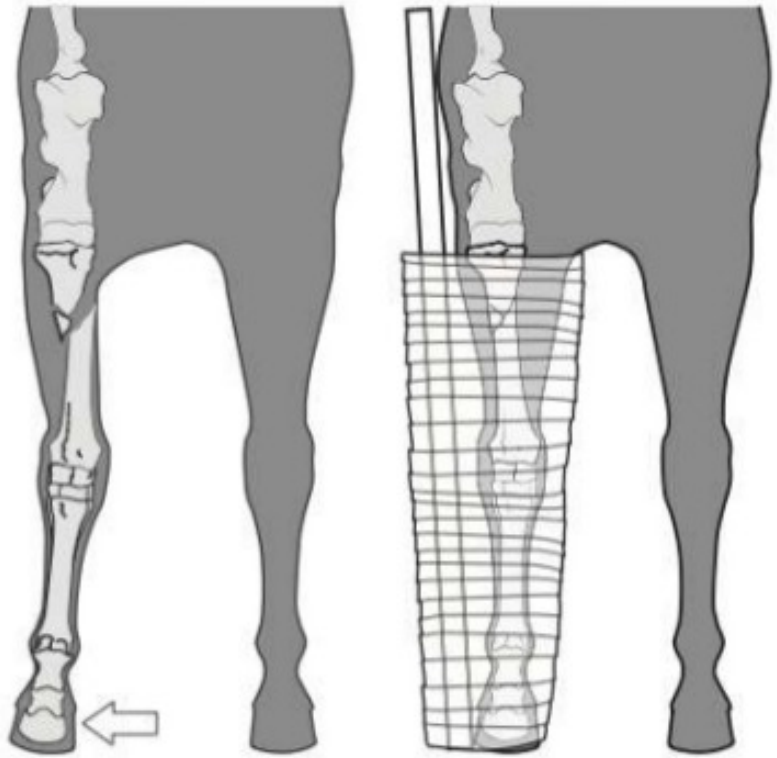
IMMOBILIZATION OF THE RADIUS / TIBIA FRACTURE

For this cathegory of fractures, the Robert Jones bandage is the best option.

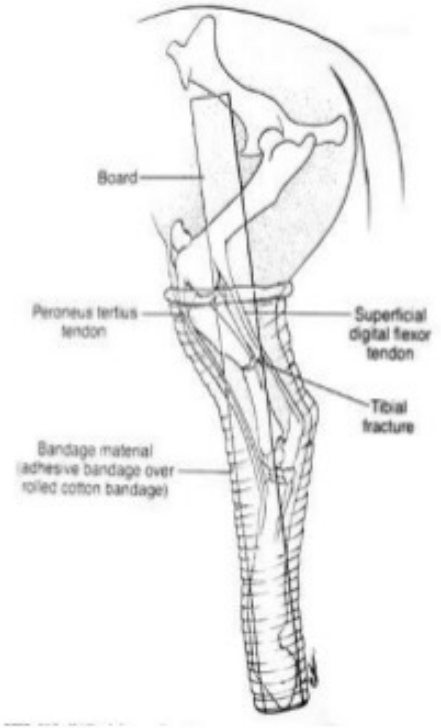
Structure:

1. if we don’t have cutaneous lesions, firt layer is represented by a 5-10 cm layer of cotton
2. elastic bandage
3. immobilization: a piece of wood, metal splint or polymer reysin splint, placed on the side of the limb
4. 5-10 cm. cotton layer
5. elastic bandage
6. vetwrap, 4-5 layers

Radius



Tarsus, Tibia



IMMOBILIZATION OF THE ULNA

ROBERT JONES BANDAGE

- SPLINT - plastic tube or plymer reysin on the caudal aspect of the limb

IMMOBILIZATION OF THE HUMERUS / FEMUR

- IN THIS CASE IMMOBILIZATION CAN NOT BE DONE PROPERLY
- Robert Jones bandage to the level of the back can improve outcome by minimising movement and reducing soft tissue trauma

FLUID THERAPY

- Fractures can be associated with hemmorhage and/or neurogenic shock – iv catheter for fluid therapy

Usually we use: 5% glucose, electrolytes, polyionic fluids - taking into account the % of dehydration and cardiovascular response

TRANSPORT OF PATIENTS WITH FRACTURES

The transport must be DONE

1. In safe conditions- suspension harness?
2. Special vehicles
3. Sedation (if necessary)

SURGICAL FRACTURE REPAIR

PHALANX FRACTURES – screw technique

Materials:

1. scrotex screw 4.5 and 5 mm
2. drill at 4.5 and 5 mm
3. drill guide at 4.5 and 5 mm
4. depth gauge
5. tape
6. drill machine
7. screw driver

Surgical technique:

1. Drill a small hole using a 4.5 mm drill machine – up to the middle of the bone
2. Continue to the other side
3. Measure the entire bone with the depth gauge and choose the appropriate screw
4. With a 5 mm surgical tap we make the screw thread inside the hole
5. Screws will pe placed using a screwdriver


RF


RF
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FRACTURE REPAIR WITH SURGICAL PLATES

LONG BONE FRACTURE REPAIR

- Each plate has to be secured using minimum 3 or 4 screws on each side of the fracture
- A minimum of 2 plates – lateral and medial- are necessary to secure a fracture

Materials:

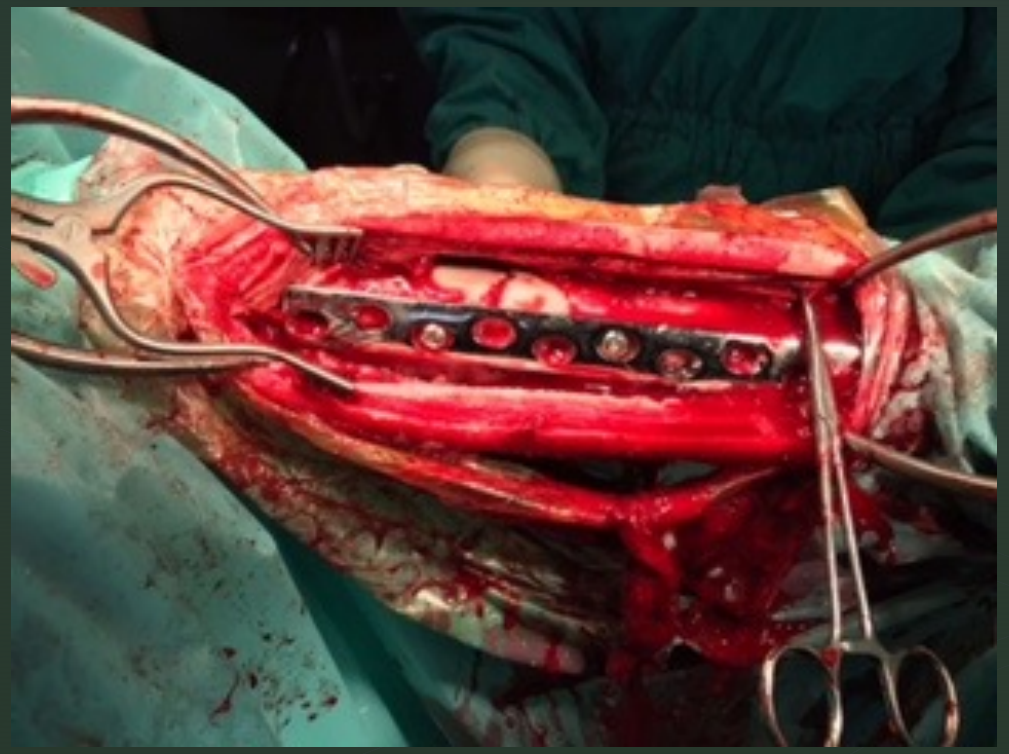
1. scrotex screw 4.5 and 5 mm
2. drill at 4.5 and 5 mm
3. drill guide at 4.5 and 5 mm
4. depth gauge
5. tape
6. drill machine
7. screw driver

Sirurgical technique:

1. soft tissue incision – identify bone parts – remove small bone pieces

2. place fractured ends in anatomical position

3. fixate plate on the cranial aspect using Spitzigen clam and then secure screws in place



FRACTURE COMPLICATIONS

1. Pulmonary infection
2. Screw dislocation
3. Implant failure (plate dislocation, srew head rupture)
4. Other limb fracture

THANK YOU FOR YOUR ATTENTION!