

# Fractures of the Tibia and Fibula



Performance Enhancing?

“IAAF rules Oscar Pistorius ineligible to compete in Beijing Games”

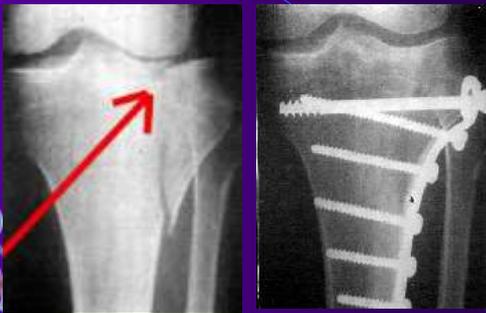
## The Tibia

- Weight-bearing long-bone of the lower leg.
- Vulnerable to torsional stresses transmitted through the feet.
- Commonly fractured via spiral or oblique fractures.
- When sufficient force is used to fracture the tibia, the fibula is rarely spared.
- Anterior third of the tibia lies superficially.

- With fracture along this region, protrusion through the skin is a probability.
- Muscle tone of the gastrocnemius and soleus tend to produce shortening or displacement post-trauma.
- Popliteal artery is susceptible to injury as it anchors to the tibia just below the origin of of soleus - leading to Volkmann's ischaemia.
- Important to ensure no angulation takes place during healing -> secondary problems.



### Fixation of a Tibial Plateau Fracture



## Treatment of Fractures of the Tibia

### Transverse Fracture

- Caused by direct violence with small area of bony contact.
- Healing may be delayed.
- Treated conservatively in a long leg PoP with leg elevated initially to ↓ swelling.
- Knee is kept in slight flexion.
- Regular checks on circulation.



## Deep Venous Thrombosis



## Unstable/Displaced Fractures

- May be several breaks in the bones resulting in many butterfly fragments.
- Open reduction may be necessary.
- Compression plates or intra-medullary nails may be required.
- External fixation may be selected.

## Other Fracture Sites

- **Tibial condyles** -> loss of muscle/ligament attachment.
- **Tibial plateau** -> secondary osteoarthritis.
- **Tibial tuberosity** -> impairment of quads function.

## Ilizarov Bracing



- Relative new to the West technique of external fixation
- External brace worn for 3-six months
- No need for internal fixation
- Small incision sites open to infection
- As strong as an internal fixator but removed after bone healing has occurred

## Physiotherapy Management

- Help the patient overcome their **FEAR**.
- Strengthen the upper body for crutch-walking.
- Foot/ankle exercises in bed.
- Static muscle contractions - quads, hams, gluts.
- Gentle knee bends, straight leg raises, seated foot slides, dorsiflexion exercises.

But what about the Fibula?

# Fractures of the Ankle



## Anatomy and Biomechanics

- Mortise and tenon joint with talus held in place by ligaments.
- Ant. part of talus is wider than post. part, so that the talus is firmly gripped by the malleoli when the ankle is dorsiflexed.
- If the malleoli are fractured the complex is weakened causing considerable damage.
- Soft tissues are at risk with ankle fractures.



## The Webber Classification System

(Formerly the Classification System known as Pott's Fractures)



## Basic Ankle Anatomy

- Three Malleoli.
- Head and Neck of Talus.
- Inferior Tibio-fibular ligaments - Syndesmosis.
- Interosseus membrane.
- Lateral Ligament Complex.
- Deltoid Ligament Complex.



## Mechanism of Injury

- Excessive inversion and plantarflexion.
- Direct violence/impact.
- Rotational injuries with foot fixed to the ground.
- Excessive eversion.
- Fall from a height.
- Front collision RTA.



## Webber Class 'A'

- Fracture occurs below the level of the syndesmosis.
- May be a fracture to one or all of the malleoli.
- Associated ligament disruption/damage.
- Avulsion of ligament off a malleolus.
- Weightbearing usually allowed.



## Webber Class 'B'

- Fracture occurs at the level of the syndesmosis.
- May be a fracture to one or all malleoli.
- Accompanied by sig. ligament damage.
- Diastasis occurs.
- Damage to the interosseus membrane.



## Webber Class 'C'

- Fracture of the fibula occurs above the level of the syndesmosis.
- Tibia not involved.
- Diastasis may be marked.
- Usually a line of failure travelling from lateral to medial aspects.
- Gross ligamentous damage.
- Damage to the interosseus membrane.



## Treatment of Webber Fractures

- Depends on class of fracture and nature of damage.
- Compression screws used to hold the syndesmosis in its shortened position.
- Plates and screws used to stabilise fractures of the fibula.
- Tibial malleolus held by screws.



- Weightbearing occurs at half the healing time (usually around the 3 week point).
- Swelling may be gross and can develop into blisters on the skin.
- Elevation used to combat this.
- Gentle exercise begun once fracture is reduced.
- Crutch-walking taught and mobilisation encouraged once the go ahead is given.

