ORTHOPAEDICS

FOR PRIMARY HEALTH CARE

LION

LEARNING INNOVATION VIA ORTHOPAEDIC NETWORKS

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Femur fracture

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Learning objectives

1. Emergency management of femur fractures.
2. Signs of fat embolus syndrome.
3. Correctly communicate the injury to the team.

Introduction

Femur fractures are usually a result of high energy injuries. A high index of suspicion for other injuries is essential. Close adherence to advanced trauma life support (ATLS) principles is critical. An adult can lose up to two litres of blood following a femur shaft fracture and early, aggressive resuscitation is paramount.

Check closely for open wounds. Any laceration on the affected leg should be treated as an open fracture and managed accordingly. A femur fracture is a clinical diagnosis, and the initial splinting and resuscitation should be initiated before obtaining X-rays. You don't need an X-ray.

Clinical findings

History

Mechanism and time of injury, past medical history (smoker, diabetics or other comorbidities, job requirements).

Examination

ATLS. Examine for other injuries and perform a neurovascular examination. A careful examination of the pelvis (including pelvis and PR stability if there is pelvic tenderness) is mandatory). C-spine should be protected in high energy injury until cleared clinically. Assess for hypovolemic shock.

Exclude Fat Embolism Syndrome (FES) (Chapter: Orthopaedic emergencies)

Additional injuries to note

Depending on the mechanism of injury, it is vital to exclude spine, pelvis, tibia and chest injuries, especially for high energy injuries. Focus on potentially lethal injuries first (open pelvis, tension pneumothorax, cardiac tamponade, multiple long bone fractures, unstable c-spine)

Imaging

Two views are needed (AP and lateral, joint above and below included). A Thomas splint should be applied BEFORE X-ray. Exclude neck of femur fractures which occur in 10% of femur shaft fractures.

Lodox image of a patient with a diaphyseal femur and ipsilateral tibia fracture. A Thomas splint has already been applied.

Classification

It is essential to communicate the fracture with the team and to document the injury adequately. Documentation should be done based on:

1. The anatomic area of the fracture: diaphysis, metaphysis, intra-articular.
2. Fracture pattern: simple, complex (comminuted), spiral, oblique, transverse.
3. Communicate, 'LARA' parameters for conservative treatment do not apply to the femur (**l**ength, **a**pposition, **r**otation, **a**ngulation).

Management

1. Early resuscitation, including fluids and analgesia. Aim for a mean arterial pressure >60mmHg.
2. A Thomas splint must be applied to **all** femur shaft fractures **before** X-rays (reduced blood loss, pain and FES).
3. There is a very limited role for conservative treatment (unless the patient is not fit for theatre).
4. For initial stabilisation, skin traction in the form of a Thomas splint is indicated for comfort and to decrease the need for blood replacement therapy. Skeletal traction and 'balanced traction' is an option if delays of more than 12h are anticipated before the patient can receive surgical management.
5. Most femur fractures will need osteosynthesis, either with an intramedullary (nail) or extramedullary (plate) fixation.

Image of a common scenario in the emergency unit. The Thomas Splint is adequately sized, both in length and width. Access to assess the neurovascular function of the foot is provided. The next step is a radiographic assessment, continuous fluid monitoring, analgesia and referral to orthopaedic surgery for definitive management

Essential take-aways

- Femur fractures are high energy injuries.
- A Thomas splint and fluid resuscitation save lives.
- The majority of patients need surgery.

Assessment

What is the most critical urgent strategy in femur fractures?

A. Call an orthopaedic surgeon.
B. Apply a Thomas splint.
C. Manage fluids.
D. Administer morphine.

(B) is correct, as a Thomas splint reduces blood loss, pain and risk for FES.

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ABOUT THE BOOK

Informed by experts: Most patients with orthopaedic pathology in low to middle-income countries are treated by non-specialists. This book was based on a modified Delphi consensus study* with experts from Africa, Europe, and North America to provide guidance to these health care workers. Knowledge topics, skills, and cases concerning orthopaedic trauma and infection were prioritised. Acute primary care for fractures and dislocations ranked high.

Furthermore, the diagnosis and the treatment of conditions not requiring specialist referral were prioritised.

* Held et al. Topics, Skills, and Cases for an Undergraduate Musculoskeletal Curriculum in Southern Africa: A Consensus from Local and International Experts. JBJS. 2020 Feb 5;102(3):e10.

THE LION

The Learning Innovation via Orthopaedic Network (LION) aims to improve learning and teaching in orthopaedics in Southern Africa and around the world. These authors have contributed the individual chapters and are mostly orthopaedic surgeons and trainees in Southern Africa who have experience with local orthopaedic pathology and treatment modalities but also in medical education of undergraduate students and primary care physicians. To centre this book around our students, iterative rounds of revising and updating the individual chapters are ongoing, to eliminate expert blind spots and create transformation of knowledge.

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The information in this book is meant to supplement, not replace, Orthopaedic primary care training. The authors, editor and publisher advise readers to take full responsibility for their safety and know their limits. Before practicing the skills described in this book, be sure that your equipment is well maintained, and do not take risks beyond your level of experience, aptitude, training, and comfort level.

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