INTRODUCTION TO TRAUMA AND ORTHOPAEDICS

2016

We will discuss
• History of the speciality
• Broad definitions
• Basic principles
• History taking
• Examination & Investigations
• Fractures – General principles
• Orthopaedics – General principles

Origin of the speciality
• 18th century
• Nicholas Andry – French Physician (released an article in 1741)

Why it is called orthopaedics
• Andry Nicholas derived the name in 1741
• Greek phrase “Orthopedia” means straight child.
  • Orthos - straight
  • Pais - child

Symbol of orthopaedics
• Nicolas Andry in 1741
• Nicholas Andry coined the term Orthopaedics

HISTORY
• Nicholas Andry
  “art of correcting deformities”
• Hugh Owen Thomas
  “fundamental principles of orthopaedics”
**HISTORY**

- Discovery of anaesthesia – C Long - 1842
- Use of Antisepsis – J Lister – 1867
- Research on bacteria – L Pasteur – 1870’s
- X-ray by Roentgen - 1895

**Sub divisions of the speciality**

- Trauma – deals with fracture
- Orthopaedics – deals with non-traumatic conditions of the bone and joints
- More than 10 specialities in Orthopaedics

**Key instruments needed**

- Measuring tape
- Goniometer
- Tendon Hammer
- Marker pencil
- A pin with protected point

**Basic principles in examination**

- Ensure privacy
- Listen to patient (50% of time he will give you the diagnosis)
- Examine patient as a whole
- “Do not hurt the patient at any cost”
- **CHAPERONE WHENEVER NEEDED**

**Basic principles in examination**

- Keep a watch on patients face all the time
- **Wash your hands after each examination**
  Infection is a preventable cause of failure of treatment.

**HISTORY TAKING**

- This is an art
- Applies to all surgical specialities
- 70% - 80% of time it will give you the diagnosis
History taking

• Name/Age
• Presenting complaints
• Any current treatment history
• Past history
• Medical history
• Drug history / Allergies
• Family history
• Social history
• Personal history

History taking

• Chief Complaints
  • Pain
  • Swelling
  • Deformity
  • Instability
  • Decreased ROM/stiffness
  • Fever
  • Discharging Wound

History taking

• Onset & Duration
  • How did it start ? Mechanism – Insidious/Trauma
  • How long?

History taking

• Pain
  • Site of pain
  • Type of pain(dull, sharp)
  • Pattern of pain
  • Radiation
  • Aggravating factors
  • Relieving factors
  • Interference with normal functions
    • Mainly SLEEP disturbance

History taking

• Swelling
  Duration and onset
  associated with pain (inflammation)
  interference with function

  Size – constant or sudden increase in size(malignancy)
History taking

• Deformity
  • Onset
  • Constant or getting worse
  • Interference with function
  • Associated pain

• Trauma
  • Mechanism
  • Treatment had
  • Current follow up

• Other specific history
  • Loss of weight and loss of appetite if you suspect malignant problems e.g. Metastasis in bones

History taking – current treatment

• Pain killers
• Visit to the GP/Hospital
• Physiotherapy
• Any walking aid needed
• Any surgery for current problem planned
• Any follow up
• Response to the current treatment

Past history

• Ask for relevant past history
• Any operations for current problem
• Any similar past episodes
• Past history of malignancy if you suspect any secondaries (malignancy) now in the bones

Medical & Surgical history

To assess for any surgical treatment
• Diabetes
• Hypertension
• Asthma
• Stroke
• Epilepsy
• Renal problems
• Any history of cardiac problems e.g. Infarction, angina

Patients may not come up with the list of diseases. They need asking everything

Drug history

• Current medications
  • Ask details the reason for taking them
• Ask for warfarin history – for thrombosis
• Allergic to any drugs
• Ask for OC pills in females
Family history
Usually important in congenital problems
e.g.
- Congenital dislocation of hips (children)
- History of rheumatoid arthritis
- History of increased flexibility – in cases of connective tissue diseases like Ehler Danlos syndrome
- History of bony lumps (In exostosis family history can be noted)

Personal history
- Job
- Smoking – ask for number / day
- Alcohol – ask for units
- Any drug history
- Menstrual history in females – if relevant
- OC pills if not asked in drug history

Social history
Important in rehabilitation planning impact of current problem on the social life
- Living alone or any help
- Type of accommodation
  - House / Flat / bungalow / warden controlled flat
- Stairs at home or not
- Any problems in cooking
- Any problems in having bath / dressing / shopping / driving

PHYSICAL EXAMINATION
General examination
- Nutrition
- Anaemia
- Jaundice
- Cyanosis
- Temperature
- Blood pressure and Pulse
- Respiratory rate
- Pedal oedema
- Lymphadenopathy

Local examination
- Upper limb
  - Expose neck / shoulders and chest wall
  - Notice the difficulties in undressing
- Lower limbs
  - Expose from umbilicus downwards (maintain dignity)
  - Make them to walk – check gait
  - Standing gives more information for inspection

MAKE THEM COMFORTABLE
LOCAL EXAMINATION

Look / Feel / Move

- Inspection
- Palpation
- Movements - Active & Passive
- Distal neurological status
- Measurements
- Special tests

MANAGEMENT

Differential Diagnosis
Investigations
Treatment

Investigations in Orthopaedics

- Bloods – (Infection)
- X rays -- Always ask for 2 views
- CT scanning
- MRI (Magnetic resonance imaging)
- Ultrasound
- Bone scan
- Arthrograms

Aim of treatment

Treatment in context of life (eg. middle aged solicitor v. footballer)
Treatment tailored to level of symptoms
- Restore function
- Do no harm

Factors affecting function

- Pain
- Deformity
- Stiffness
- Instability

Fracture

- What is a fracture
- Break or discontinuity of the bone

FUNCTION

Movement is life
Fractures – Basic principles

To restore the function of the limb

Fracture types

- Transverse
- Oblique
- Spiral
- Comminuted - multifragmentary
- Pathological
- Greenstick

Pattern varies based on force

Ask for Mechanism of injury

- Spiral
  - Twisting force

- Bending
  - Butterfly fragment

- Compression
  - Short oblique

- Tension
  - Transverse

Paediatric fractures

- Greenstick fractures

- Epiphyseal injuries

Paediatric fractures always remodel – depends on the age and the site of fracture

Be aware of Non-accidental injuries in children. Be suspicious if history does not match the injury. Examine the child completely.

Epiphyseal fractures

SALTER-HARRIS TYPES

- Type V

Principles in fracture examination

- Make sure the patient is stable
- Joint above and below should be examined
- Neurological / vascular status to be assessed
- X RAYS – Always ask for 2 views
  - Joint above and below to be seen
How to describe a fracture (X-ray)

- Name of the patient
- Date taken
- View – Antero-posterior / Lateral
- Bone and site involved
- Type of fracture
- Involvement of Joint (above and below)

Fracture types

- CLOSED (SKIN INTACT)
- OPEN (SKIN BREACHED)
- COMPOUND FRACTURES

Surgical emergency

Principles in fracture management

**Basic principles**
- Pain relief
- Immobilisation

**Main principles**
- Acceptable reduction
- Immobilisation
- Rehabilitation

First make sure that the patient is stable (Airway, breathing, circulation)

AIM OF INTRA-ARTICULAR #

- ANATOMICAL REDUCTION
- STABLE FIXATION
- EARLY MOBILISATION

TREATMENT

- CONSERVATIVE
- SURGICAL
TREATMENT

SURGICAL FIXATION

EXTERNAL  INTERNAL

DISTAL TIBIA #

Intra articular fractures

ORIF OF TIBIA

EXTERNAL FIXATION

Supracondylar fracture

Fracture distal radius
Fixation of Tibia and fibula

TROCHANTERIC #

DYNAMIC HIP SCREW FIXATION

# NECK OF FEMUR

Fixation with screws
Remodelling in paediatric fractures

Bone is a dynamic structure with constant turn over

# SHAFT OF FEMUR AT 6 WEEKS

AT 3 MONTHS

AT 6 MONTHS

AT 9 MONTHS

AT 1 YEAR
RESULT OF CONSERVATIVE TREATMENT

Orthopaedics - Principles
Aim is to restore function

Types of orthopaedic problems
• Congenital - e.g. congenital dislocation of hip
• Inflammatory – e.g. Rheumatoid arthritis
• Infective pathology – e.g osteomyelitis
• Tumours - e.g. Benign or Malignancy
• Degenerative – age related - e.g osteoarthritis

Osteoarthritis
• Common
• Pain and disability
• Usually degenerative but can follow infection and trauma
• Pain relief is the key
• Management – conservative or surgical depending on the stage of presentation

Main principles in treatment
• Osteotomy - for realignment
• Arthroplasty - Joint replacements
• Arthrodesis - fusion

Principles in treatment
• Infection control is a key issue.
• Extreme precautions in theatre.
• Infection is the biggest threat to success in orthopaedic surgical procedures.
 Congenital problem

Congenital dislocation of hip
Pelvic osteotomy

Infection

RHEUMATOID ANKLE JOINT

OSTEOARTHRITIS OF KNEE

Key radiological features in osteoarthritis

• Joint space narrowing
• Osteophytes
• Subchondral sclerosis
• Cystic lesions

TOTAL KNEE REPLACEMENT
Problems in surgical management

- Infection
- Peri-prosthetic fractures
- Dislocation of prosthesis
- Surgical damage to neurovascular structures
CABLE-PLATE FIXATION

Peri-prosthetic fracture of knee

RETROGRADE NAILING

1ST STAGE REVISION-Infection

2ND STAGE REVISION TKR

DISLOCATED THR
Summary
• Proper History and examination
• Right treatment for the right patient
• Always aim to restore function – cosmetic is secondary.