FRACTURE – 1

FRACTURE CAVICLE:

- Fall on out-stretched hand or fall on shoulder.
- Junction of middle and outer one third is m/c site.
- Outer fragment is displaced medial and downward; inner fragment is pulled upward.
  T/t: Displaced fracture: Figure of '8' Bandage or triangular sling.
  Undisplaced: Triangular sling.
- M/c complication: Malunited fracture.

FRACTURE OF SCAPULA:

- Direct high injury trauma.
- Early healing due to good blood supply
- T/t: Rest with triangular sign early mobilization.

DISLOCATION (D/L)OF SHOULDER:

- M/c joint to dislocate
- Anterior D/L > Post D/L
- Post D/L is seen in electric shock/ epileptic fit.
- Bankart's lesion: Stripping of glenoid labrum.
- Hill-Sach's lesion: Depression in humeral head on postero lateral (P/L) quadrant.
- Attitude in any dislocation in obduction / external rotation/ flexion.
- On examination : Dugas test
  a. Hamilton ruler test.
  b. Callaway's test
  c. Dugas test

- T/t : Reduction under sedation
  a. Kocher's maneuver.
  b. Hippocrates maneuvers.

Complication:

M/c nerve injury in axillary nerve (Regimental Badge anesthesia)

- Recurrent dislocation: More common in young patient.

Posterior dislocation of shoulder: Direction of force causing posterior dislocation: Internal rotation and adduction.

- - Diagnosis is frequently missed, as shoulder looks normal. Front of the shoulder looks flat with a prominent coracoid process.
  Luxatio in erecta: Downward dislocation. Patient presents with the arm in full abduction.
- **Recurrent anterior dislocation of shoulder:**
- - Hill Sachs lesion
- - Bankart's lesion
- **Surgeries for recurrent dislocation of shoulder:**
- ***Bankart's operation***:
- ***Putt Platt's operations***

FRACTURE OF SHAFT HUMERUS:

- Direct trauma / indirect Twisting injury
- Displacement is distraction and lateral angulation
- T/t: children > 5 years of age: Arm-chest Bandage

Adult: M/c U-slab/ cast in c/o fracture at lower 1/3 Hanging Cast.
Operative with Narrow DCP in c/o unstable fracture / segmental fracture / Polytrauma.

Complication:
Radial nerve is most common nerve involved in Humerus (wrist Drop).
In c/o closed fracture wait & watch.
In c/o open injury / post reduction
Nerve injury = Exploration is required

- Delayed Neglected nerve injury tendon transfer and done i.e. modify J. NE's.
- Delayed union/ non union
- Common in transverse # of mid shaft.

INJURIES AROUND ELBOW:

- Three bony point relationship.
- Carrying angle: males 10 -11°
  14 -16°

Ossification around elbow:
CHMTLO
C: 2 years - capitate
H: 4 years - Hamate
M: 6 years - medial condyle
T: 8 years - trochlea
L: 10-12 years – lateral condyle
O: 8-10 years - olecranon

SUPRACONDYLAR FRACTURE:

- M/c injury in age group of 4-8 years
- Fall on out-stretched hand.
- Extension type > flexion type (95% : 5%)
- Displacement:
  Post shift
  Post tilt
  Internal rotation
- Complication:

Bilateral artery injury: injured due to sharp edge of proximal fragment.

- T/t: Immediate closed reduction of fracture. If pulse return than treat any other s/c fracture. If no return of pulse with in one hour explanation.
- **Injury to Nerve:**
  M/c. Median nerve followed by Radial nerve.
- Compartment syndrome
- Mal-union: M/c complication of S/c
  M/c deformity is cubitus varus
  M/c deformity Gun-Stock deformity
- Myositis ossificans:
- Volkmann's ischemic contracture:
  : Attitude flexion of PIP > DIP joint
  : Volkmann's sign will be positive

T/t: Passive stretching / muscle sliding operation

* **T/t of S/c #:**

- Undisplaced #: above elbow in 90° flexion at elbow with full pronation.
- Displaced #: Reduction with plaster application
- If not acceptable reduction K-wire fixation after reduction
- If excessive swelling or wound than continues traction i.e. Dunlop's traction

FRACTURE OF LATERAL CONDYLE:

- Fall on out-stretched hand with various strain
- Milch's classification : type I and II
- Salter and Harris classification: type II and IV

T/t: # of necessity
T/t in ORIF
Complication:

a. M/c complication in nonunion with cubitus valgus deformity
b. Tardy ulnar nerve palsy. T/t is anterior transposition of nerve.

INTER CONDYLAR FRACTURE:

- High energy trauma
- 'T' and 'Y' fracture
  T/t: OR IF
- Complication:
  a. Mal-union
  b. OA
  c. Stiffness

FRACTURE OF MEDIAL EPICONDYLE:

- Associated with ulnar nerve injury
- T/t: A/E plaster

DISLOCATION (D/L) OF ELBOW:

- Post dislocation more common
- Fall in out-stretched hand
- Three point relation is lost (reversal of triangle)
- M/c nerve injury is median nerve injury
- T/t: Reduction followed by splintage

FRACTURE OF OLECRONON:

- Fall on tip of elbow
- T/t: if undisplaced : A/E slob with elbow in 30° flexion
- Usually T/t is surgical tension bend wiring.
- M/c complication nonunion

FRACTURE OF RADIAL HEAD:

- Fall on out-stretched hand with valgus force
- MASON's CLASSIFICATION
- T/t: Undisplaced #: A/E slob followed by mobilisation
- Communited #: excision of fragments and whole head.

- **Pulled elblow:**
  a. Common in children age group 2-5 years
  b. Annular ligament pulled off the head of Radius
  c. X-rays = No Abnormality detected.
  d. Attitude of pronation with limitation of motion
  e. T/t: closed reduction

FRACTURE FOREARM BONES:

- Indirect blow: direct injury
- T/t: undisplaced children : closed reduction with splintage
- Adults: OR IF with plate and screw.

Complication:

1. Mal-union (with limitation of pronation and supination)

MONTEGGIA FRACTURE DISLOCATION:

- # of proximal 1/3rd of ulna with D/L of Radial head.
- Anterior angulation with anterior D/L of head radius more common.
- T/t: Of if
- Complication: Mal-union with limitation of motion

Galeazzi fracture dislocation

- Fracture distal 1/3rd of radius with dorsal dislocation of head of ulna.
- T/t: T.O.C. : ORIF
- Complication: Mal-union

COLLES'S FRACTURE:

- Commonest fracture in age > 40 years
- Fall on out-stretched hand
- # at 2 cm from distal articular surface.

- Displacements: "6"
  a. Impaction
  b. Dorsal displacement
  c. Dorsal tilt
  d. Lateral displacement
  e. Lateral tilt
  f. Supination
- Deformity: Dinner-fork deformity.
- T/t: Closed reduction + Below elbow cast (Colles's cast)
- Complication:
  a. M/c mal-union with stiffness of joints

SMITH'S FRACTURE:

- Reverse Colle's fracture
- "Garden Spade" deformity
- T/t: Closed reduction + plaster

BARTON'S FRACTURE:

- Fracture line going tilt articular surface of radius
- Volar: volar fragment
- Dorsal = dorsal fragment
- T/t: closed reduction, if fails than OR IF

SCAPHOID FRACTURE:

- M/c carpal bone fracture
- M/c site is waist of bone.
- Fall on out-stretched hand
- Tenderness in anatomical snuff –box
- X-rays oblique view of wrist is essential for diagnosis
- T/t: immobilize in scaphoid cast.

Complication:

a. avascular necrosis: Proximal fragment will become sclerotic
b. delayed / nonunion

LUNATE DISLOCATION
Most common dislocation at wrist
Causes Median Nerve palsy
Goes into AVN

HAND INJURY:

- ***Bennett's Fracture dislocations:**
  a. Oblique intra articular fracture base Ist metacarpal
  b. T/t: closed reduction with plaster application if not accurate or if:
  c. Complication: Osteoarthritis of joints

* **ROLANDO's fracture:**
  a. "T" or "Y" shape fracture of base of Ist metacarpal
  b. T/t: closed reduction with plaster if unacceptable than ORIF:

FRACTURE OF METACARPAL:

- Boxing: fall on out-stretched hand.
- Boxer's fracture: Fracture through neck of 5th metacarpal.
- T/t: closed reduction with plaster or ball bandage can also be used.
- In c/o # of phalanges treatment is Buddy Strapping

- **Mallet finger:**
  a. Sudden passive flexion on DIP joint
  b. Avulsion of extension Tendon from Base of distal phalange
  T/t: immobilization in splint for 6 week

FRACTURE - 2

FRACTURES OF LOWER LIMB

FRACTURE NECK OF FEMUR
Hip: * Ball and socket joint
* Neck shaft angle: 135°
* Angle of ante version: 10-12°
Blood Supply:

- Retinacular : Mainly- Lateral group most important (Branch of lateral circumflex)
- Medullary
- Metaphyseal (small vessels)
- Artery of Ligamentum teres

Classification: Anatomical, Pauwels, Gardens

The ***causes of nonunion*** in this fracture are:
1. Deprivation of the blood supply of the femoral head
2. Absence of cambium layer of periosteum which could promote callus formation
3. Synovial fluid prevents clotting of the fracture hematoma
4. Tamponade effect
5. Difficult to control proximal fragment

Clinical feature: Limb is externally rotated.
- Supra trochanteric shortening of the limb present.

X- ray: Shenton's line is broken

Treatment:
* Children - =CRIF with Moore's Pin / Knowles pin

*Adults up to 60 yrs
CRIF with Sliding/dynamic hip screw (DHS) / compression screw /Cannulated screw
Later on
Osteotomy or Prosthesis
*> 60yrs
Displaced or undisplaced = Prosthesis

Complications:
1. Thromboembolism - 25%
2. non union - 30-40%
3. Avascular necrosis 15-35%
- X-ray changes at 3-6 months
- Bone Scan is useful in diagnosis.

Subtrochanteric Fracture:
Between lesser trochanter and 2-3 inches distally
Due to direct trauma
In younger individual

Treatment:
* Conservative - If young patient
- If severely comminuted fracture
* Surgery - inter locking Nap - DHS

Intertrochanteric Fracture:
* Common than I/C fracture
* Elderly patients - Female

Clinical features:
* Marked Shortening
* More external rotation

Treatment:
* Surgery - CRIF with DHS

Complications:
- Malunion (commonest) coxa vera
- Secondary osteoarthritis
- Avascular necrosis (rare)

Dislocation of Hip:
- Posterior dislocation common:
- Mechanism of injury: Flexion and Neutral adduction (DASH BOARD INJURY)
- Commonly associated fracture : Posterior Acetabular rim

Clinical features:
* Shortening
* Attitude: FL.ADD. IR (Flexion, adduction, internal rotation)
* Vascular sign of Narath: Positive
* Injury to Sciatic Nerve

Treatment:

Close reducton by – allies method

Complication: Early
- Sciatic nerve injury (10%) usually common peroneal component

Late:
- Myositis ossificans
- Avascular necrosis - risk increases with time lapsed
- Secondary osteoarthritis - occurs with or without AVN
- Unreduced dislocation

Anterior Dislocation
- Attitude : FL ABD EX. ROT (Flexion,abduction,external rotation)
- Vascular sign of Narath + ve
- Injury of femoral artery/ vein/ nerve

Complications: Early
- Neurovascular injury - Irreducibility
Late: - Secondary O.A. * AVN * Recurrent dislocation

Fracture Shaft Femur:
* In young adults * Due to major violence
* Blood loss upto 1500ml
In proximal 1/3
Illio psoas – Flex, in distal 1 /3
Gastrocnemius flex the distal end of fracture

External rotators
- Adduction and externally rotate proximal fragment
Treatment: 0-2 yrs/12 kg wt. Or 20 pounds - Gallows / Modified Bryant traction
2-15 yrs - Skeletal traction / Casting
Adults - Internal fixation - Best Method
(K-nail was used previously) Interlocking nail – T/t of choice now

Supracondylar fracture of femur:
Distal fragment angulated and displaced posteriorly due to pull of Gastrocnemius muscle

Treatment
- Open Reduction to prevent knee stiffness

Displaced Fracture → Dynamic Condylar Screw (DCS)
In children: Type II Epiphyseal injury
If displaced - close reduction and AK cast with knee flexed to 60°

Complications:
- Vascular injury to popliteal vessel
- Knee stiffness
- Delayed union
- Mal union
- Common peroneal nerve injury
Hoffas' fracture: Intra - articular fracture of distal femur involving condyle (in coronal plane)
Treatment: OR IF

Fracture of proximal tibia:
- Unsually intra articular

- Commonest: Fracture of lateral tibial plateau (Bumper fracture)

Treatment:
- Undisplaced fracture : AK cast - non weight bearing of 6 wks
- Displaced fracture : Traction - cast brace
- Depressed fracture : < 8mm depression - AK cast
  >8mm depression - Traction (skeletal) - OR IF
- comminuted fracture : Skeleton Traction

Complications:
- Knee stiffness
- Secondary osteo arthritis (O.A)
- Popliteal artery injury

Fracture Tibia and Fibula:
- Commonest long bone fracture
- Subcutaneous, most common bone for open fracture
- Distal 1/3 more prone to non union and delayed because of deficient blood supply
- Mechanism of injury - RTA

In isolated fracture tibial shaft: Delayed union common because intact fibula acts as a structure to prevent close contact.
In isolated fracture fibula: Exclude ankle injury

Treatment: A conservative Treatment (95%)

(A) Close reduction and AK cast for 3 wks than PTB cast (Patellar tendon bearing cast) Functional cast bracing of Sar miento Allows knee movement
- Allows sitting
- Allows early ambulation
- Allows early union

Acceptable Reduction:
- Ankle and knee joint surface should be parallel
- Acceptable varus / valgus in AP view is 5°
- Anterior/ posterior angulation in lateral view is 10°
- At least 50° apposition
- Shortening 5-7 mm acceptable

(2) Pins above and below fracture with AK POP cast - for unstable /open fracture

(B) External Fixator: In compound fracture

Complications:
* Delayed union * non union 20%

Predisposing Factors:
- Significant initial displacement
- Comminution
- Distraction
- Mid shaft fracture
- Soft tissue damage
- Infection esp. in compound fracture
- Inadequate immobilization
- Intact fibula

- Infected nonunion
- Shortening
- Compartment syndrome
- Refracture
- Claw toes due to tethering of long extensors
- Malunion: If angulation > 10°leads to secondary O.A
- Infection
- Joint stiffness
- Fat embolism

Injuries of Knee Ligament
- Hinge joint- between tibia and femur compound synovial joint
- Saddle joint - between patella and femur

Anterior cruciate: prevents anterior glide of tibia on femur. Taut in 30 deg of flexion.
Posterior cruciate: prevents posterior glide. Taut in whole range of movement
Mechanism of injury: Most common (damage to medial structures) Abducent, flexion and internal rotation.

O' Donohue's Triad: Injury to
- Medial collateral ligament
- Anterior cruciate ligament
- Medial meniscus
- **Osteochondritis of tibial tubercle**- Os good Schlatter's disease
- **Osteochondritis of lower patella pole** - Sinding Larson Disease
- **Injury to femoral attachment of medial collateral ligament with new bone formation**
- Pellegrini Stieda's disease

Collateral ligament injuries:
Common on medial side (due to valgus stress)
Associated with other ligament injuries
Diagnosis: Stress test (Adduction / Abduction)
Treatment: Incomplete- cylindrical cast - Complete - Surgical repair

Cruciate Ligament Injury:
- ACL tear more common than PCL
- ACL tear due to hyperextension injury in internal rotation or external rotation with abduction of flexed knee
- PCL tear due to dash board injury
- Tears predisposed to instability and O.A. changes
- LACHMAN'S TEST : Useful in acute ACL tear
- DRAWER'S TEST, ROTATORY TEST : Useful in combined tears

Treatment:
- Reconstruction by patellar tendon/ hamstring

Meniscus injuries:
- Fibrocartilage in structure
- Functions of meniscus
- Makes joint stable
- Shock absorber
- Help in knee locking mechanism
- Controls gliding and rolling motions of knee
- Assists in nutrition by distribution of synovial fluid
- Weight transmission
- Increase contact area

Medial Meniscus:

Medial: Lateral meniscus tear = 20:1
Medial Meniscus tears of femur is rotated internally on tibia

- Giving way
- Locking
- Medial joint line tenderness
- Locking if present is diagnostic
- Quadriceps wasting

Signs:

- **Locking +ve**
- **McMurray test +ve**
- **Apley's grinding test +ve**: Distinguishes between meniscal and ligament lesions

Treatment:
Partial menisectomy by arthroscopoy

- Resuturing in peripheral tear

<u>Fracture Patella</u>

- Largest sesamoid bone

Functions:

- Increase the mechanical advantage of Quadriceps
- Aids in nutrition of articular cartilage
- Protects femoral condyle from injury
- Acts as hydraulic brake

Mechanism of injury

- Direct - Cause comminuted fracture
- Indirect - Cause transverse fracture/ fracture of proximal/ distal pole

❖ M:F Fracture = 2 : 1

X rays - AP/ Lateral/ Skyline view to reason of undisplaced vertical fracture
Treatment: undisplaced fracture / displacement < 1-2 mm with intact quadriceps expansion: Cylindrical cast

Displaced fracture: Surgery

- OR IF - TBW for transverse fracture
- Patellectomy with reconstruction of extensor apparatus – for communited fracture
- Partial- For small proximal/ distal pole fracture

<u>Ankle injuries:</u>
- Hinge joint - Supination: Raises medial aspect of foot (inversion + Adduction)

- Described by Pott
- Twisting injuries are commonest mode of ankle injuries
- Inversion injuries more common because foot is more stable in eversion and also injury due to external rotation
- Important factor is stability of tibiofibular mortice
- Classification depending on Mechanism of Injury:

Commonest mechanism of ankle fracture : Abduction - External rotation Inversion Ankle sprain : Rupture of anterior talofibular ligament (most common ligament to rupture)

Trimalleolar fracture: - cotton fracture

Pylon fracture: due to vertical loading eg: jumping
- Treatment: Conservative: If stable fracture
- Operative: OR IF

- Important: Accurate reduction of medial side

Third malleolus is fixed after reduction if forms more than one third of articular surface of tibia.

Complications:
- Malunion
- Non union - In medial, malleolus due to periosteal interposition
- Secondary O.A.
- Ankle stiffness

Fracture Calcaneum:
- Commonest tarsal bone to fracture
- Intraarticular (70-75%) - Extraarticular (30-35%)
- Mechanism of injury - Fall to height
  Associated injury to spine especially lumbar spine (10%)
  Associated injury to lower limb (26%)
  X-ray: AP - lateral - Axial Calcaneal view

Treatment: Conservative – below knee Plaster: Operative - ORIF

Fracture Talus:
- Precarious blood supply
- 3/5 th covered articular cartilage
- No muscle attached
- Aviator fracture : Fracture neck of talus due to sudden hyperextension of foot (Dorsiflexion)

Commonest site: Neck

Treatment: Conservative: Undisplaced (B/K plaster cast in planter flexion)

Operative: displaced - ORIF
Complications:
- Non union
- Avascular necrosis
- Post traumatic O.A

Injuries of Foot:
Tarsometatarsal injuries: Tarsometatarsal dislocation **(Lisfranc dislocation)**
- ORIF with k wires.

Complications: Compartment syndrome - Circulatory obstruction to forefoot

Matatarsal Injuries:
- Jones's fracture : Avulsion fracture of base of 5^{th} metatarsal due to forcead inversion of the foot
- March fracture : (Stress fracture)
- Usually affects second metatarsal. Also occur in tibia, fibula, pelvis, femoral neck and femoral shaft
- Fracture just distal to midshaft of metatarsal neck- Pain is presenting feature
- No displacement occurs usually
- Initial X-ray may be normal but isotope scan shows ↑ed uptake
- T/t Rest

Spine Injuries
- Spinal injuries carry a double threat: damage to the vertebral column & damage to the neural tissues.

Spinal cord injury:

Concussion: Spinal shock

- Nerve root involvement
- Cord involvement
- Complete
- Incomplete

Incomplete Cord lesions

- Persistence of any sensation distal to the injury (peri anal pinprick) suggests an incomplete lesion & therefore a favorable prognosis.

Presentation: 4 main types of presentation:
a) Central cord syndrome
b) Anterior cord syndrome
c) The posterior cord syndrome.
d) The Brown - Sequa rd syndrome

Bony injuries:
Dennis Weber classification: Based on three column concept.

- Anterior column: Consists of anterior half of the vertebral body & disc and anterior longitudinal ligament.
- Middle column: Consists of posterior half of the vertebral body and the disc and posterior longitudinal disc.
- Posterior column: Consists of the posterior vertebral arch consisting of transverse process, spinous process and the accompanying ligaments.

Injury to Stability

- 1 Column Stable
- 2 Columns Unstable
- 3 Columns Grossly Unstable

Middle column: Most important column. Its injury is leads to instability.

Whiplash injury: Occurs in cervical spine – is a hyper extension injury..

- ***Clay shoveler's fracture***: Avulsion of the tip of the spinous process of usually at $C_7$and T_1.
- ***Jefferson's #:*** Fracture of C_1.Usually no neurological damage.

Fracture Pelvis

- Usually due to RTA
- High mortality due to associated
  a) soft tissue injury
  b) head injury
  c) respiratory tract injury
  d) abdominal injury
- Most are stable and respond to conservative treatment
- Commonest Single Pubic Ramus Fracture

Classification:

- Single bone fracture without break in pelvic ring
  Avulsion fracture- Lesser trochanter (LUDLOFF SIGN). Pain on Hip Flexion

Tests: Compression- Distraction Test

X-rays:

CT Scan: Useful for posterior pelvic ring fractures and complex acetabular fractures

Complications:

- Haemorrhage: Injury to iliac vessels is cause of death

Diagnostic peritoneal lavage. CT scan

- Injury to urinary tract: Especially posterior urethra (membranous)
  Bladder injury usually extra peritoneal
- Iliofemoral venous thrombosis
- Sciatic nerve injury
- Heterotopic bone formation: Prophylactic Indomethacin is useful
- AVN of femoral head
- Secondary O.A.
- Fat embolism

Paralytic ileus due to retroperitoneal hematoma.

INFECTIONS

OSTEOMYELITIS:

- Pyogenic infection of the bone
- Types:
  - Acute (< 3 wks)
  - Chronic (> 3 wks)

ACUTE OSTEOMYELITIS:

- **STAPH. AUREUS** (commonest) In 80-90 % culture positive cases
- **H. INFLUENZAE** (7 months - 2 yrs) & GROUP B STREPTOCOCCI
- **SALMONELLA** (in Sickle cell disease)
  88% - in children

Starts in Metaphysis because of

- Hair pin bend of metaphyseal vessels (leads to vascular stasis)
- Defective phagocytosis in children
- Metaphyseal hemorrhage due to repeated trauma (acts as culture media)

Pathophysiology:

- Metaphyseal Abscess : It spreads:
  - Subperiosteal (in children, periosteum is loosely attached)
  - Joint involvement if - metaphysis is intracapsular

Infection rarely crosses growth plate because it has no blood vessels and periosteum is firmly attached to the plate at this level.

Symptoms:

- Pain in presenting symptom. Fever
- Localized bony tenderness is essential physical sign
- Local swelling/ restriction of movement
- Raised temperature / local erythema

Diagnosis:

Clinical examination: Blood investigation:

X-ray: around 48 hrs (non specific changes)
Rarefaction is earliest sign
Loss of demarcation of line between subcutaneous shadow and muscles
b/w 7-10 days
Periosteal reaction (new bone formation)

MRI within 24 -48 hrs

Blood Culture + ve in 60%
Aspiration and cytology

Management: Acute osteomylitis is an emergency-

Key to management:
- Early diagnosis
- High index of suspicion

General prinicples:
- Splintage
- Elevation
- IV fluids
- Appropriate Antibiotics -Effective before Pus forms and also prevents reformation of Pus
- Route (2 wks iv and 4 wks oral)

Local management:
Surgery (indications)
- Abscess formation
- Severely ill child
- Fails to respond to antibiotics for 48 hrs

Exploration and evacuation (I/ D), drill holes

Complication:
- chronic osteomyelitis
- Septicemia/ pyaemia /
- septic arthritis
- Pathological fractures
- growth disturbances

CHRONIC OSTEOMYELITIS:
Osteomyelitis persisting for more than 3 wks
Etiology:
- Sequelae of acute Osteomyelitis
- Compound fracture
- Surgery

Usually due to: **STAPH. AUREUS**

Clinical features: no systemic symptoms usually
- Irregular bony thickening
- Draining sinuses (fixed to underlying bone)
- Scars and muscles contractures
- Involucrum
- Growth disturbances- usually shortening
- Pathological fractures - commonest complication
- Restricted joint movements
- Amyloidosis
- Squamous cells carcinoma of discharging sinus

Treatment: Surgery
Sequestrectomy and Saucerization
↓ Cavity made shallow for effective drainage

Complications of Chronic Osteomyelitis:
1. Recurrent acute attacks

2. Chronic sinus
3. Pathological fractures
4. Joint contractures
5. Epithelioma of sinus tract
6. Growth retardation
7. Bone lengthening
8. Amyloidosis

BRODIE'S ABSCESS:
- Localized contained chronic Osteomyelitis
- In metaphyseal area
- In young adults
- Present with local tenderness and intermittent pain
- Due to low virulence **STAPH**. In 50%

X-ray:
Cavity at metaphysio- Epiphyseal junction with reactive new bone

Diagnosis: By Biopsy

Treatment: Curettage and bone grafting under antibiotic cover

SCLEROTIC OSTEOMYELITIS OF GARRE:
- Chronic or subacute Osteomyelitis
- No pus formation
- In children and young adults
- Affects subperiosteal region leading to thickening
- Due to low grade anaerobic infection

SALMONELLA OSTEOMYELITIS:
- In sickle cell anemia
- Diaphysial osteomyelitis
- Several bone affected
- Spine involved
- Stool culture may be + ve

SEPTIC ARTHRITIS
Septic arthritis is defined as a bacterial infection of the joint, which causes an intense inflammatory reaction with migration of polymorphonuclear leucocytes, and subsequent release of proteolytic enzymes.
MC organism: Staph aureus (50%)
Other common organism in children < 2 yrs.: H influenzae

Joint can become infected by:
1. most common route is hematogenous eg MC is knee
2. secondary to nearby osteomyelitis particularly when metaphysis is intra articular
3. Direct injury (Intra articular injection , Arthroscopy , Blood spread ,trauma)

Sites of involvement:
1. Knee (M.C.)
2. Hip

- Usually leads to bony ankylosis.

Pathology:
1. Infection starts in the synovial membrane.
2. Destruction of articular cartilage.

Outcome may vary

1. Complete resolution and return to normal.
2. Partial loss of articular cartilage and fibrosis of the joint.
3. Loss of articular cartilage and bony ankylosis. Most common
4. Bone destruction and permanent deformity of the joint.

Clinical features:

-Child is Irritable, febrile with high grade fever.
- Acute pain and swelling in a single large joint esp. hip.
- Resists joints movement in all directions (global restriction) and tenderness present.

Investigations:

1. Joint aspiration and synovial fluid analysis and gram staining: Most accurate diagnostic tool.
2. Lab investigations: WBC increases ESR increases.
3. Ultrasound: Shows a joint effusion early when x-rays are normal.

Treatment: -

1. Early cases :Arthrotomy with i/v antibiotics
2. Late cases :If articular cartilage is destroyed → arthrodesis in functional position

Complications: -

1. Joint destruction
2. Dislocation
3. Osteoarthritis
4. Ankylosis –bony
5. Acute osteomyelitis
6. Growth disturbance

TOM SMITH ARTHRITIS: Is septic arthritis of the hip joint seen in infants less than one year of age. There is destruction of the hip joint with painless abnormal mobility of the hip joint and shortening as the outcomevh

SKELETAL TUBERCULOSIS:

- Accounts for 1-3% of cases
- Percival POTT: Described the 'GIBBUS' deformity and did not describe the disease or its tuberculous nature
- Always secondary
- Commonest site: Spine (50%) next - Hip
- Mostly in first three decades of life
- Usually due to human T.B. Bacillus
- Route of spread
  - Blood : Through BATSON'S PLEXUS to spine
  - Lymphatic
  - Direct

Clinical features:

- Insidious onset with dull chronic ache
- Monoarticular : H/O night cries
  ↓ed joint movements gross wasting of muscles
- Constitutional symptoms: Only in 20%

Investigation:

- Hematological : Hb, TIC, DLC, ESR
- Mantoux Test: Non specific
- ZN staining / Biopsy
- X-ray - no typical findings
  - earliest - rarefaction

- late - joint destruction

❖ Exploratory Arthrotomy

Principle of Treatment:

❖ General Treatment
❖ Chemotherapy: Main stay is ATT
❖ Local Treatment: Aims to prevent , correct or decrease the deformity

Disease → Synovial - Mobility by traction
Disease → Osseous - Ankylosis in functional position

❖ Surgery
❖ Cold abscess: Treatment is usually conservative

TUBERCULOSIS SPINE;

Types of Involvement

- Para discal
- Central
- Anterior
- Posterior

❖ 50% of skeletal tuberculosis
❖ Dorsal (42%)
❖ Dorsolumbar (12%)
❖ Lumbar (26%)
❖ 98% paradiscal (Metaphyseal)
❖ Exudative type - common
❖ Caseous type

Clinical features:

❖ Insidious onset
❖ Constitutional symptoms
❖ Back pain/ back stiffness
❖ Cold abscess

Physical findings:

❖ Protective attitud**e**
❖ Tender spinous process
❖ Wasting of muscles
❖ Neurological complications
❖ Restricted movements especially forward flexion
❖ Cold abscess/ sinuses
❖ In 95%- Kyphosis (Knuckle)

Diagnosis: can only confirmed on aspiration and cytology

Lab test:
X-rays: Average number of affected vertebra: 3

1. Early - ↓ed disc space
   - bones rarified (after 30% calcium loss)
   - irregular articular margins

2. Late - anterior wedging
   - central body collapse (concertina collapse)
   1. Soft tissue swelling and its calcification

Paravertebral Abscess:

1. In cervical - Retropharyngeal abscess
2. Upper thoracic - V- shaped and widened mediastinum
3. Below D_4 - Fusiform / Bird nest
4. Psoas abscess

TREATMENT: Middle path regime

- ❖
- ❖ CHEMOTHERAPY: Main stay- Effective in 90%
- ❖ Indication for surgery:
  - Patients with neurological complications
  - Patients not responding to chemotherapy

- ❖ Surgical Procedures:
  - Anterior decompression with or without fusion
  - Anterolateral decompression with or without fusion

Complications of T.B. Spine:

1. Paraplegia : In 10-30 %
   Common in dorsal spine
   Causes:
   - Inflammatory edema
   - Caseous tissue (most common cause)
   - Sequestra

Early onset : With active disease
: With in 2 yrs of disease
Late onset : With healed disease

2 yrs after onset of disease
Motor functions are affected first.

First Sign: Ankle clonus and upward planters

TUBERCULOSIS OF THE HIP JOINT:

- ❖ Second most commonly affected site
- ❖ Hematogenous spread
- ❖ Affects Acetabulum (upper part) most commonly
- ❖ Heals by fibrous ankylosis
- ❖ Most common early symptoms: Painful limp
  # fixed flexion deformity (detected by Thomas test)
  # Adduction/ abduction deformity

Stages of T.B. Hip:

- ❖ Stage of Synovitis
  - Flexion , Abduction and external rotation of hip
  - Apparent lengthening

- ❖ **Stage of early Arthritis:**
  - Flexion adduction and internal rotation deformity
  - Apparent shortening (True shortening < 1cm)

  Washing of muscles with decreased movements\

- ❖ **Stage of late Arthritis:**
  - Exaggerated flexion, adduction and internal rotation
  - True shortening

❖ **Stage of Subluxation/ Dislocation due to advanced arthritis**, leading to
- Migratory Acetabulum (wandering acetabulum)
- Protrusio acetabuli

Treatment:

a. **Stage of Synovitis and early arthritis:**
- ❖ Chemotherapy
- ❖ Traction
- ↓ed muscular spasm
- corrects deformity
- maintains joint space

Gradual mobilization: Synovectomy and Debridement

b. **Stage of advanced arthritis:**

❖ Aim is fibrous ankylosis in functional position
Osteotomy: For ankylosis in bad position
Arthrodesis: For painful ankylosis
Girdlestone Arthroplasty

TUBERCULOSIS OF KNEE:

Deformities
- Flexion
- Posterior subluxation
- Lateral rotation
- Abduction of Tibia

CHARNLEY'S Compression arthrodesis

TUBERCULOSIS OF SHOULDER:

Caries Sicca (because there is no effusion into joint i.e. dry type)

TUBERCULAR OSTEOMYELITIS:

In short tubular bones
- Involves metacarpal and metatarsals
- In phalanges
- Affects shaft (lytic lesion in middle of the bone with subperiosteal new bone formation)
- Spindle shaped expansion of bone
- **SPINA VENTOSA**

ARTHRITIS AND CONGENITAL DISORDERS

- Articular cartilage doesn't has blood supply or nerve supply

Osteoarthritis
- Primary : Idiopathic,
- Secondary: Secondary to preexisting abnormality i.e. #, some other arthritis.

1. M/c joint involved are knee and hip
2. OA of DIP joint leads to " Heberden's node's. It has genetic predisposition.

3. Nodes on PIP joints are called " Bouchard's nodes"

4. **Radiological features**
    a. Joint space narrowing
    b. S/c sclerosis
    c. S/c cysts
    d. Osteophytes

Treatment
- Conservative. NSAID + Physiotherapy + spintings
- In severe disease : joint replacement

RHEUMATOID ARTHRITIS

- Female > male
- Genetic predisposition presence
- It is B/L symmetrical polyarthritis with involvement of small joint of hand and feet.
- HLA- DR_4 and DR_1 is associated with ↑ risk of R.A
- M/C joint involved in MCP of hand –85% other can be PIP joint intertarsal joint
- Cervical spine is involved in 40% of cases.

- Diagnosis:
  ACR criteria: four of following

    1. Stiffness > 1 have in around joint
    2. Arthritis > 3 joint C swellys / fluids)
    3. Arthritis of PIP, MCP or with joints
    4. B/L symmetrical
    5. Rheumatoid nodules
    6. Positive RF test
    7. Radiological change (i.e. symmertic destruction of joint, periarticular osteopenia, erosions)

- Rheumatoid factor: it is positive in 5% of normal population, 85% in R.A.

- **Blood test:**
  ESR and C- reactive protein ↑

Normocytic – normochromic anemia, thrombycytosis,
hypergamma globulinemia.

- **Pathology:** "Pannus" formation leading to articular cartilage destruction.

T/T:
- **Conservative T/T:**
  DMARD's + physiotherapy+ NSAID

- Severe cases surgical T/t:
    1. Synovectomy
    2. Arthrodesis
    3. Replacement of joints
- Still disease: Juvenile R.A

Charcot's joints:
- Seen in joint with loss of sensory supply
- Seen in tabes darsalis, leprosy, diabetes, syringomyelia

- M/C cause is diabetes
- Painless arthritis with new bone formation with gross destruction of bones.
- T/t: Combative (splintage): fusion is difficult to achieve.

Gout:
- Mono sodium urate crystal deposition in joint
- Male > female
- Females usually post menopausal
- M/c joint individual is MCP of great toe in foot.
- TOPHI may get deposited in s/c tissue

Diagnosis Characteristic clinical presentation
1. ↑blood uric acid level
2. Synovial fluid examination will reveal negatively birefringent needle shape crystal
3. Tophi in s/c tissue
4. Radiologically periarticular erosion with radio opaque deposit in between erosion

T/t: Acute disease NSAIDs or colchicine

Chronic:
1. Allopurinol- ↓ uric acid production
2. Probenecid- ↑ excretion of uric acid

Pseudogout:
- Deposition of calcium pyrophosphate dihydrate (CPPD)
- M/c joint knee
- Radiological calcification in menisci or in articular cartilage

Ankylosing spondylitis:
- Male > female
- Young age group
- Associated with HLA – B27 (almost diagnostic)
- Central joint involved initially i.e S.I joint, lower lumbosacral joint, hip etc
- Main C/O Backache
- Spine X-ray : "BAMBOO spine"

Paget's Disease:
- Seen in 5^{th} and 6^{th} decade
- ↑ in osteoclastic as well as osteoblastic activity
- Bone become coarse, dense and deformed
- Blood: ↑ serum alkaline phosphatase levels
- Complication: Pathological fracture, secondary malignancy, CHF etc
- T/t: in C/O pain:
  1. Calcitonin
  2. Bisphosphonates
  3. Prevention of fracture

Carpal tunnel syndrome:
- Compression of median nerve of carpal tunnel
- M/c idiopathic
- Also seen in c/o pregnancy, acromegaly, hypothyroidism, rheumatoid arthritis malunited colles #, compound palmar ganglion
- Tingling in thumb and index finger with muscle Wasting (thenar Hump)
- Test:
  1. Phalen test

- Confirmation :Nerve Conduction Value (NCV) will be delayed
- T/t: splintage, Local Steroid injection, Surgical release

Osteopetroisis
- Also called marble bone disease.
- Alber Schonberg Disease

Congenital Disease:
- **Developmental dysplasia of Hip (DDH):**
- Girls > boys : : 5:1
- (L) side > ® side
- m/c in C/o Breech Presentation, first born child and cesarean section
- Associated with foot deformity or torticollis

Pathology:
- Capsule is contracted
- shallow acetabulum
- Ossification in delayed
- Anteversion is more

Diagnosis:
- Test: Ortolani test : Reduction of dislocated head
- Barlow' test
- Galeazzi sign
- Trendelenburg test
- Waddling gait
- Telescoping Present

Investigation:
Ultrasonography
- Radiography: Usually of help in > 3 month of age
    1. Von –Rosen view

Treatment:
0-2 yrs Reduction
2-6 yrs Osteotomies
6-11 yrs U/L Osteotomies/ B/L leave it as such
> 11 yrs: leave if sec OA than replacement

- **Complications:**
    1. AVN
    2. Secondary OA

Club foot (Congenital talipes equino varus)
- Planter flexion at ankle, inversion at tarsometatarsal joint and forefoot adduction
- Male > female
- 50% b/c : R> L

Diagnosis:
    1. Clinical appearance
    2. X ray of foot: Kites angle
- Pathology is D/L Talonavicular joint
- T/t should be started as early as possible
- Initially t/t is splintage / cast

- Sequence of correction of deformities i.e. first in forefoot adduction followed by inversion followed by equinus deformity
- If residual deformity than surgical procedure like Tendo Achillis(T.A) lengthening, postero medial soft tissue release, Dilwyn Evan procedure (excision of calcaneocuboid joint),
- triple arthrodesis
- ***0 Days to 1 Years of Age***: Manipulation of foot & above knee casting.
- ***2 . 1 Years to 4 Years of Age***: ***Turco operation*** (Posteromedial soft tissue release) or CSTR for children less than 4 yrs. of age.
- ***4 Years to 12 Years of Age***: Bony procedures
- ***Delwyn Evan's operation***: Dorsolateral wedge excision of the calcaneocuboid joint
- ***Dwyer's operation***: Osteotomy of the calcaneum to correct varus
- ***After 12 yrs. of age***: Triple Arthrodesis
- ***Talectomy***: For severe uncorrected clubfoot
- - In Arthrogryposis multiplex congenita
- **Rocker bottom foot:** Due to enthusiastic overcorrection of equinus deformity before correcting adduction and inversion.

Perthes disease:

- Osteochondritis of femoral head
- Boys > girls
- M/c age is 4-10 years
- B/L in 20 % of cases

Diagnosis:

1. Patient will present with painless limp
2. There will be loss of abduction and Int. rotation
3. Radiography will show:
   a. Initially ↑ joint space
   b. Flatting and deformation of lateral epiphysis
4. MRI will show the extent of damage
5. Classification was given by Catterall,

- T/t: if age < 4 year with less than 50 % head involved : conservative
- If age > 4 year and head involvement > 50 % then surgical t/t i.e. osteotomy to realign joint

BONE NEOPLASIA

M/C bone tumor is metastasis (secondary)

M/C primary malignant bone tumor is Multiple Myeloma

M/C benign bone lesion is osteochondroma

Primary malignant bone tumor (children > adults)

Secondary bone lesions (adult > children)

BENIGN LESION: Lesion that do not metastasize

Sites of origin:

1. **Epiphyses**
   a. Skeletally immature – chondroblastoma
   b. Skeletally mature – giant cell tumor (GCT)

2. **Metaphysis**
    a. Osteochondroma
    b. Osteosarcoma
    c. Chondrosarcoma
    d. Secondaries
3. **Diaphysis**
    a. Ewing's sarcoma
    b. Osteoid osteoma
    c. Adamantinoma

Investigation:
IMAGING

1. **Plain X-ray**: - Of the part in two planes: AP & lateral.
   - Diffuse periosteal new bone formation and extension of the tumor into the soft tissues → suggestive of malignant change.
   - Chest x-rays is essential for evidence of secondaries in chest: Osteogenic sarcoma metastasizes very early to lungs.

2. **CT scan**
   - It picks up the metastasis of the size of 2 mm compared to x-rays, which does so at 2 cm size.
   - Detects pulmonary metastasis at the earliest: ***Investigation of choice***.

3. **MRI**
   - Most accurate method in assessing bone and soft tissue involvement.

4. **Radio Nuclide (bone) scanning**

Skeletal scintigraphy (99m **Tc –MDP**) is the best method of detecting skip lesions, silent secondary deposits and the extent of spread of bone tumor to other areas of skeletal system.

5. **Biopsy**

STAGING: -
ENNEKING STAGING
IA: low grade Intra-compartmental (lesion confined to single anatomical plane).
IB: - Low grade extra-compartmental (beyond single compartment).
IIA: - High grade intra-compartmental.
IIB: - High grade extra – compartmental.
III: - Lesion high or low grade, intra or extra compartmental with distant or regional metastasis.

BENIGN TUMORS

OSTEOCHONDROMA:

- Commonest benign lesion of the bone
- It is a Hamartoma in nature
- M/C site is around knee joint, located in the metaphysis
- Usually it is pedunculated, it has stalk with head pointing away from the metaphysis
- T/t is extraperiosteal excision, if there is pain due to trauma, compressive symptoms, rapid increase in the size of lesion, cosmetic abnormalities
- Complication: 1% has malignant transformation into Chondrosarcoma
- Diaphysial achalasia: multiple exostosis (Champagne glass appearance on x ray) more chance of malignant transformation i.e. 5%.

ENCHONDROMA:

- M/C site is small bone of hand and feet
- Age group of presentation 20-40 year
- It is slowly expansible lesion
- X ray showing lytic area with cortical thinning with intralesional calcification
- T/t is curettage and bone grafting
- Ollier's disease: Multiple enchondroma with deformity
- Maffucci syndrome: Multiple enchondroma with cavernous hemangiomas.

CHONDROBLASTOMA:
- Age less than 20 years
- (Before closure of epiphysis)
- M/C site near knee joint in the epiphysis
- Radiological there will be lytic area with speckled calcification
- T/t: curettage with bone grafting

FIBROUS DYSPLASIA:
- Normal bone is replaced by fibrous tissue
- Radiologically, there is lytic area with subperiosteal bone formation
- M/C location is metaphysic
- It can be Monostotic or Polyostotic
- In case of Monostotic M/C bone is femur, tibia or ribs
- Polyostotic lesion in which multiple bones are involved
- Diagnosis: X ray findings, biopsy, increase in serum alkaline phosphatase
- Presentation is with pain / deformities
- M/C complication is pathological fractures
- "Shepherd crook" deformity in femur.
- T/t: Curettage with bone grafting
- "Albright Syndrome": Precocious puberty in females with polyostotic fibrous dysplasia with cutaneous pigmentation

OSTEOMA:
- M/C site is skull and facial bone
- T/t can be left alone but if cosmetically unacceptable the simple excision

OSTEOID OSTEOMA:
- Age group 5 -25 years
- Diaphysial location, M/C site is tibia followed by posterior element of spine
- Aspirin tumor: pain characteristically relived on medication with aspirin
- M/C symptoms is pain
- Diagnosis: X ray will show zone of sclerosis surrounding a radiolucent nidus
- Size < 1 cm
- T/t: Excision of the lesion

OSTEOBLASTOMA:
- 2nd decade at presentation
- Diaphysial location, M/C site is long bone / vertebrae
- Size > 2 cm
- Pain is the presenting symptom
- T/t is curettage with or without bone grafting

SIMPLE BONE CYSTS:
- True cysts
- Age of presentation is 10 - 20 years.
- M/C site is upper end of humerus (metaphysial)
- Radiologically central location with no or minimal expansion of the cortex

- Lesion if present near the growth plate it is called "active lesion" if away from the growth plate it is called "static lesion"
- Cyst is filled with fluid containing prostaglandin
- T/t:

1. Aspiration of the cyst and injection of Methylprednisolone
2. If big cyst, then Curettage with bone grafting
3. If already fractured than treatment is plaster application because with fracture healing lesion may correct spontaneously

Complication: M/C is pathological fracture

HEMANGIOMA:
- M/C site vertebral body and skull
- Pain
- Radiologically, there is loss of the horizontal trabeculae with prominence of the vertical trabeculae. (Corduroy appearance)
- T/t: In case of pain – radiotherapy

LOCALLY INVASIVE TUMORS

ADAMANTINOMA:
- M/C site jaw bone / appendicular skeletal Tibia
- Honeycomb lesion radiologically
- T/t: Resection because local recurrence is very common after curettage

CHORDOMA:
- Locally malignant lesion
- Origin from the remnant of notochord
- M/C site sacrum followed by cervical area
- Radio logically there will be destruction of bone with expansion
- Presenting symptom is pain with or without neurological abnormalities
- T/t: Complete excision with or without radiotherapy

GAINT CELL TUMORS (OSTEOCLASTOMA):
- M/C age of presentation is 20 - 40 years (after epiphysial closure)
- M/C site is around knee joint (Lower end femur)
- M/C location is epiphysis with extension into the metaphysis
- Tumor usually does not enter the joint
- Radiologically: Eccentrically placed, solitary lytic area, expansile lesion,
- Soap Bubble appearance
    - T/t: Wide excision with reconstruction of the limb or curettage with cryotherapy with or without bone grafting

MALIGNANT BONE LESIONS:

OSTEOSARCOMA:
- Second most common primary malignant bone lesion
- Tumor cell produces new bone
- Age group is between 10-20 years
- M/c site is lower end of femur followed by upper end of tibia
- Primary: age group 10-20 years, no preexisting lesion, more aggressive lesion
- Secondary: Pre-existing lesion i.e. Paget's disease, fibrous dysplasia, irradiation to the bone, bone island.
- Age group > 45 years, less malignant

- Classified according to histopathology: Osteoblastic, Chondroid, Fibroblastic (they are less malignant). Telangiectatic (more malignant)
- Diagnosis: Radiologically: Irregular destruction with erosion of cortex with pathological new bone formation, CODMAN'S triangle, SUN-Ray's appearance

- Serum alkaline phosphatase: Elevated; only prognostic value
- Biopsy is confirmatory in nature
- T/t: Confirmation of diagnosis: Radiological finding, followed by biopsy
- Assessment of spread: X-RAY chest for lung metastasis. CTscan /bone scan for local skip lesions and MRI

EWING SARCOMA:

- Age group 10-20 years
- M/C site is diaphysis of long bone (two third cases), flat bone (one third cases)
- Presenting complaints: pain and swelling with mild fever.
- Radiological: Lytic area in the medullary canal with subperiosteal new bone formation i.e. ONION-PEEL appearance
- Confirmation: Biopsy of the lesion: Uniform small cells arranged in PSEUDO-ROSETTE pattern
- T/t: highly radiosensitive tumor.
- Metastasis by blood, Bone-to-Bone metastasis common
- Prognosis poor

MULTIPLE MYELOMA:

- Malignant neoplasm of plasma cells
- Affect flat bones i.e. skull, pelvis, and vertebrae
- Can be solitary in location - PLASMOCTOMA
- Age group >50 years,
    - Presenting complaints are severe back pain with or without pathological fractures and neurological symptoms

Diagnosis: Radiologically: Multiple

PUNCHED OUT, LYTIC lesions.
Blood: Increase ESR (>100), Increase serum protein level, REVERSAL OF A: G RATIO, increase serum calcium level with normal Serum alkaline phosphatase,

M- SPIKE on electrophoresis in 90% cases
 Urine: Bence - Jones protein in 30% cases
 Confirmation: Percutaneous/open biopsy showing MYELOMA CELLS
 T/t: Chemotherapy DOC: Melphalan in combination with vincristine and prednisolone, in cases of neurological symptoms local RT will help.
 M/C cause of death is renal complication.

CHONDROSARCOMA;

 Age group 40-60 years
 Secondary in cases of pre-existing lesions i.e. osteochondroma, multiple enchondroma
 X ray will show destruction with intralesional MOTTELED CALCIFICATION (Popcorn app)
 Confirmation: biopsy
 T/t: Wide resection

SECONDARY MALIGNANT LESIONS:

 M/C malignant bone lesion
 M/C primary in case of males are LUNGS
 M/C primary site in case of female is BREAST
 M/C site is SPINE and proximal limb girdle
 Investigation: of choice is BONE SCAN

 On X-ray most of them are osteolytic
 OSTEOBLASTIC: are seen in case of carcinoma prostate and some breast tumors

 Blood: Increase serum calcium level and high ESR, increased serum acid phosphatase level in cases of prostatic cancer.
 T/t: Prophylactic fixation in cases of long bone if size > 2cm, more than 50% width, intractable pain
Tumor with Increased ESR: Multiple Myeloma
Tumor with increased acid phosphatase: Prostatic carcinoma.

NERVE INJURIES AND NEUROLOGY

Peripheral Nerve Injury:

- Spinal nerves 31 pairs
- Dermatomal distribution
- Degeneration distal to injuries (Secondary or Wallerian degeneration)
  At proximal end forms - Neuroma
  At distal end forms - Glioma

Classification: By SEDDON

Neurapraxia:

- Temporary (physiological disruption of nerve impulse conduction)
- Axis cylinder preserved
- Incomplete loss of function
- Complete recovery in 6 wks
- No wallerian degeneration

Axonotmesis:

- Axon breakdown
- Endoneurium intact
- Motor March
- Spontaneous recovery expected
- Tinel's sign +ve

Neurotmesis:

- Complete anatomic section
- No recovery/ incomplete recovery even with surgery

Management:

- In closed fracture
- In open fracture
  - Primary repair : Within 6-8 hrs
  - Delayed primary repair : 7-18 days
  - Secondary repair: After 18 days
- Nerve Graft:
  - Sural nerve
  - Sensory branch of radial nerve
  - Medial/ lateral cutaneous nerve of forearm

ENTRAPMENT SYNDROMES

Chronic nerve compression causes slowing of conduction & variable degree of demyelination.
Common sites for nerve entrapment are

- Carpal tunnel – Median nerve
- Cubital tunnel – Ulnar nerve
- Tarsal tunnel – Posterior tibial nerve
- Inguinal ligament – Lateral cutaneous nerve of the thigh **(**Meralgia Paresthetica)
- Neck of the fibula – Common peroneal nerve

IATROGENIC INJURIES

Nerves most frequently involved are

1. Axillary & musculocutaneous nerve: During operations for recurrent dislocation of the shoulder.
2. Radial nerve: During humeral shaft surgery.
3. Posterior interosseous branch of the radial nerve: During approaches to the proximal end of the radius.
4. Median nerve at the wrist: In tendon surgery.
5. Sciatic nerve: In hip arthroplasty.
6. Common peroneal nerve: In operations around the knee.

Peripheral Nerve Injury:

Ulnar Nerve:

- Root valve : C_8 - T_1
- Branch of medial cord of branchial plexus
- Distribution
  - Arm : Nil
  - Forearm: Flexor carpi ulnaris, Medial half of Flexor digi. Prof
  - Hand - Sensory
  - Motor
- Lumbricals (medial 2)
- Interossei (Dorsal and palmar)
- Hypothenar
- Adductor pollicis
- Injury leads to : Claw Hand (Ulnar claw hand)
  - Hyperextension at M.P. joints and flexion at I.P. joints of digit (Intrinsic minus hand)
- Complete Claw Hand (both ulnar and median nerve paralysis)
  - Syringomyelia
  - Poliomyelitis
  - Peripheral neuritis
  - Volkmann ischemic contracture
  - Leprosy
  - Amyotrophic lateral sclerosis

- **Tests for ulnar nerve injury:**
  - Froment's sign
  - Egawa test
  - Card test
  - Ulnar Paradox

Treatment:

- For acute injury: KUNCKLE BENDER SPLINT
- Of clawing : Modified Bunnell's / Brand operation

Principle of Tendon Transfer: (usually done after 18 months after nerve repair)

Immediate: if little hope of recovery)

- Age > 5 yrs
- Synergistic
- Power >4
- Own nerve and vascular supply
- Straight line, in subcutaneous tissue
- Adequate tension
- No malunion/ joint stiffness/ infection
- Good range of passive movements

Tardy Ulnar nerve Palsy (late onset)

- Ununited fracture lateral condyle of humerus
- Fracture medial epicondyle humerus
- Cubitus valgus
- O.A. Elbow
- Dislocation elbow
- Shallow ulnar groove

Treatment:
Anterior transposition

Median Nerve injury:

- **Tests:**
  - Pen test (paralysis of abd. Pollicis brevis)
  - Simian / ape thumb like hand
  - Pointing index finger

Radial nerve injuyr:
Crutch palsy/ Saturday night palsy/ injection palsy Fracture shaft humerus/ Tourniquet palsy

- Branch of post cord
- Root value C_{5-8} T_1
- Braches and distribution/ loss of sensation over dorsum of 1^{st} web space
- Commonest - Peripheral nerve injured
- High type/ low type
  - Wrist drop

Treatment:

- Cock up splint
- Surgery

Brachial plexus injury:
Causes:

- Traction injury - RTA , birth injury
- Penetrating injury
- Surgery in area

Traction injury:

- Upper brachial plexus lesion: ERB- DUCHENNE (C_{5-6}) : Mainly
- Lower brachial plexus lesion : KLUMPKE
- Total
- If preganglionic, due to Avulsion of root from cord - no recovery

Poliomyelitis
Lower Motor Neuron
Asymetrical
Pure motor
No sensory involvement

Spina bifida
Congenital disorder in which the two halves of the posterior vertebral arch have failed to fuse during fetal life.

(A) Spina bifida occulta:
1. Midline defect between the laminae (occulta – hidden).

Common in the lumbosacral spine: **S_1** being the commonest site

MISCELLANEOUS

GAIT
- Gait - 2 phases:
    A) Stance phase
    B) Swing Phase

Type of gait:
1. ***Trendelenburg gait***:
2. ***Gluteus maximus gait***: Patient lurches backwards.
3. ***Waddling or Duck Waddle gait***:
4. ***Antalgic gait***: When the gait is painful.
5. ***Scissoring gait***: in spasticity, e.g. C.P. - Legs cross while walking.

PROLAPSED INTER VERTEBRAL DISC (PIVD)
- ***M.C. site: L_4-L_5 than L5-S1***
- Disc herniation at L_4-L_5 level compresses the L_5 nerve root.

Based on location of disc
1. Central disc
2. Posterolateral disc

Clinical Features:
- Backache
- Sciatica: Radicular pain
- Early urinary retention (Cauda equina syndrome)

Examination:
1. ***SLR test*** + ve
2. ***Lasègue test.***
3. With
    L_5: Weakness of big toe extension and knee flexion.
    S_1: Weak plantar flexion & eversion of the foot.
    - Diminished ankle jerk.

Investigation:
1. X-ray: To exclude other bone disease
2. ***MRI: Investigation of choice***

Treatment:
1. Rest: Bed rest with physiotherapy.
2. Removal: ***Indications:***
    a) Cauda equina compression syndrome
    b) Failed conservative management after 3 weeks (persistent pain).
    c) Progressive neurological deficit

    Discectomy.

SPONDYLOLISTHESIS

- Forward shift of the spine.
- ***MC site: L_5 over S_1***

Essential lesion: Interruption in the continuity of the past interarticularis.

Spondylolysis: The defect in the pars exists but without the forward slip.

Classification:

1) ***Lytic (Isthmic):*** True Spondylolisthesis.
   M. C. type (50%)
   - Defect in the pass interarticularis, which is occupied by fibrous tissue.
2) ***Dysplastic***: Least common type.
3) ***Degenerative***: Due to long standing inter segmental instability.
4) ***Pathological***: Due to generalized or localized bony disease.

Clinical Features:

- Backache or sciatica may occur in adults.
- Steps can often be palpable.

X-rays:

Oblique views: "

Treatment:

Mild: Rest, NSAID, brace, spinal flexion exercises.
Severe: Operative: ***fusion***.(***Slip >30%),***.

LUMBAR CANAL STENOSIS :

- Most common in lumbar spine.
- Lateral or antero poaterior diameter of spinal canal is decreased, due to bone or ligament hypertrophy.

Causes : * Degenerative * Achondroplasia * PAGET's disease
* Fluorosis * Fracture spine

- Common in males, below 40 yrs of age.
- Low backbone
- Neurogenic claudication : Pain in buttocks and legs after walking which decreases on sitting and forward bending. Peripheral pulse normal. Neurological deficit may be present. No tropic changes.

Investigation : C.T. diagnostic

Treatment : Conservative , surgery - Laminectomy.

DE QUERVAIN'S DISEASE

- Painful thickening of the ***common tendon sheath containing*** extensor policies brevis ***and*** abductor pollicis longus at the radial styloid process.
- It is stenosing tenosynovitis.
- ***Finkelstein test***.

T/t:
1. Rest , splintage & NSAID.
2 Local infiltration of hydrocortisone
3. Slitting of the tendon sheath

OSTEOCHONDRITIS

- Occurs in children & adolescents during phases of rapid growth
- Affected bone shows features of avascular necrosis

Three types

1. **CRUSHING** – Spontaneous necrosis of the ossific nucleus in a long bone epiphysis (secondary ossification center) or one of the cuboidal bones of the onset or foot

Head of Femur	**Perthes**
Metatarsal head	**Freiberg**
Navicular	**Köhler**
Lunate	**Kienbock**
Capitulum	**Panner**
Vertebrae	**Scheuermann's**

2. PULLING OSTEOCHONDRITIS

Excessive pull by a large tendon may damage the apophysis to which it is attached
Tibial tuberosity – Osgood Schlatter's disease
Calcaneus apophysis – Sever's disease

3. **SPLITTING OSTEOCHONDRITIS** (osteochondritis dissecans)

A small segment of articular cartilage & the subjacent bone may separate (dissect) as an avascular fragment commonest joint – knee – lateral surface of medial femoral condyle

TRIGGER FINGER

- ***Stenosing tenosynovitis of the digital flexor tendons***.
- It is called trigger finger because of the snapping observed when the patient actively flexes or extends the I.P. joint.

Treatment:

1. Rest, NSAID
2. Local infiltration of hydrocortisone & Division of the tendon sheath.

ACUTE INFECTIONS OF THE HAND

Nail fold infection: ***Paronychia (MC hand infection)***
Organism: S. aureus
Kanavel Sign
Bunnell's no man land (Tendon rupture)

Treatment

1. Antibiotics
2. Rest and elevation
3. Splintage: ***Position of safety – Intrinsic plus position***.

Drainage of the sites of maximal tenderness, never across the skin crease.

OSTEOPOROSIS

- Decreased mass per unit volume of normally mineralised bone due to loss of bone proteins.
- No change in the ratio of mineral phase to organic phase.
- in cortical thickness and reduced no. and size of trabeculae of cancellous bone.
- Osteoid seams are of normal width.
- Commonest cause : Involutional bone loss in perimenopausal age.

Other causes :

* Prolonged bed rest
* Prolonged casting
* Alcoholism
* Drug : Heparin, Methotrexate , Steroids
* Hyperparathyroidism, Cushing syndrome, thyrotoxicosis, Diabetes.
* Rheumatoid arthritis, scurvy
* Cirrhosis
* Sarcoidosis
* Osteogenesis imperfecta
* Acidosis
* Epilepsy

* Malabsorption

- Most common symptom : Back pain secondary to vertebral compression - occurs after trivial trauma.
  Spinal cord compression rare.
  Pathological fractures of hip.
- Xray : Generalised rarefaction
  Cod fish vertebrae
  Fractures in lower thoracic & upper lumbar vertebrae
- Serum Investigation : Calcium Phosphate & Alkaline Phosphatase - normal
  ESR - normal
- Bone mass measurement : Dexa (Dual energy X -Ray Densito Metry) - Gold Standard
- Bone biopsy :

Treatment :

* Acute : NSAIDS, bed rest, physiotherapy
* Hormone (Estrogen) replacement therapy is most effective measure for prevention. ↓es bone resorption.
* Calcium intake : 1500 mg/day
* Vitamin D
* Regular exercise
* Calcitonin : 50 U, Subcutaneous / Nasal spray
* Anabolic steroids
* Biphosphonates : ETI Dronate, Alien Dronate (anti resortive agent)
* Fluoride : Stimulates osteoblastic proliferation and function
  ↑ bone formation

IMPORTANT COMPLICATIONS OF FRACTURE

FAT EMBOLISM:

1. Occlusion of small blood vessels by the circulating fat globulins.
2. Seen in c/o long bone fractures i.e. fracture femur or fracture pelvis or multiple fractures
3. Onset of symptoms are seen after 48 hours
4. Patient will be restless, confused, drowsy, febrile with tachypaenea
5. Diagnosis: CXR: Snow storm appearance, Petechial hemorrhages in the supraclavicular area, ABG showing hypoxia i.e. PaO2 < 80 mmHg.
6. Sizzling test: Detect the presence of fat in the urine.
7. T/t: Symptomatic T/t, self-limiting condition but if marked hypoxia Than IPPV and assisted ventilation will be required.

COMPARTMENT SYNDROME:

1. Normal compartment pressure is 0 – 8 mmHg
2. Increase in the intracompartmental pressure leading to loss of microvascular circulation of the distal limb
3. Pressure above 30 mmHg is abnormal
4. Diagnosis: 5 P`s: pain, paresthesia, Pulseless- ness, pallor, and paralysis. Clinically there will be stretch pain. Confirmation: by measuring the intracompartmental pressure by the Stryker method.
5. T/t: Once the diagnosis is made the treatment is Fasciotomy
6. If not treated in time can lead to Volkmann's ischemic contracture
7. most common compartment to be affected is fore arm flexor compartment
8. Next most common is Ant compartment of leg.

CRUSH SYNDROME:

- Severe and extensive injury to the muscle along with ischemia

- Can also occur after removal of forgotten tourniquet
- Myoglobin from the damage muscle goes to circulation leading to the myoglobinuria followed by acute renal failure
- Usually take 2 to 3 days to develop
- Patient will have scanty dark colored urine with restlessness, apathy and delirium
- T/t is removal of all necrotic material and conservative and supportive management of ARF with or without dialysis

MYOSITIS OSSIFICANS:

1. Post traumatic ossification
2. It is a type of heterotrophic ossification
3. Ossification in the fracture hematoma due to invasion by the osteoblast cell from striped periosteum
4. M/C site is around elbow and in the thigh.
5. Common in children due loose periosteum, more common in patient with head injury and patient of paraplegia due to spinal injury.

T/t: In Active stage (when pain present, local area is warm, x-ray showing fluffy mass) it should be plaster immobilization for few weeks followed by active mobilization. In Mature stage if bone is hindering with the joint motion than T/ t is surgical excision of fragment.

FRACTURES IN CHILDREN

- **Green stick fractures**
- **Torus (Buckle) Fracture**
- **Epiphyseal injuries: -** ***Salter and Harris classification:***
- ***Thurston Holland sign.***

Fractures MCQS 1

1.Sling and swathe bandage is used for
   a. AC joint dislocation
   b. Clavicle fracture
   c. Scapula fracture
   d. Shoulder dislocation

2.Most common site for autologous Bone graft
   a. Iliac crest
   b. Fibula
   c. Tibia
   d. Ulna

3.The operative procedure known as “microfracture” is done for the
   a. Delayed union of femur
   b. Non union of tibia
   c. Loose bodies of ankle joint
   d. Osteochondral defect of femur

4.All of the following can be complication of malunited Colles fracture except
   a. Rupture of flexor pollicis longus tendon
   b. Reflex sympathetic dystrophy (RSD)
   c. Carpal tunnel syndrome
   d. Carpal instability

5.bankart’s lesion is
   a. anterior superior glenoid
   b. superior glenoid
   c. anterior inferior glenoid
   d. inferior glenoid

6.Hanging cast is used in
   a. Humerus #
   b. Tibia #
   c. Femur #
   d. Radius and ulna #

7.Recurrent dislocation are most common in
   a. Shoulder
   b. Patella
   c. Hip joint
   d. Elbow joint

8.In children, best remodeling is seen in fracture with
   a. Angulation in metaphysis
   b. Angulation in diaphysis
   c. Rotation in diaphysis
   d. Rotation in metaphysic

9.Thurston- Holland sign is seen in
   a. Oblique # of lower 1/3rd humerus
   b. Reverse oblique # of intertrochanteric femur
   c. Salter-Harris type II #
   d. Coronal # of femoral condyles

10.Traumatic anterior dislocation of shoulder with sensory loss in lateral side of forearm and weakness of flexion of elbow joints. The most likely injured nerve is
   a. Radial nerve
   b. Ulnar nerve
   c. Axillary nerve
d. Musculocutaneous nerve

11.Muscles involved in Volkmann's ischemic contracture
   a. Flexor pollicis longus
   b. Flexor profundus
   c. Flexor sublimis
d. All

12.Excision of head of radius is NOT done in children since it causes
   a. Tardy ulnar nerve palsy
   b. Instability of elbow joint
   c. Secondary osteoarthritis of elbow
d. Subluxation of inferior radioulnar joint

13.Management of smith fracture is
   a. Open reduction and fixation
   b. Plaster cast with forearm in pronation
   c. Closed reduction with below elbow cast
   d. Above elbow cast and forearm in supination

14.Most common type of supracondylar fracture is
   a. Flexion type
   b. Extension type
   c. Abduction type
d. Adduction type

15.Common site in scaphoid fracture is
   a. Waist
   b. Proximal fragment
   c. Distal fragment
   d. Tilting of the Lunate

16.Open reduction and internal fixation is done in all except :
   a. Patella #
   b. Olecranon #
   c. Volar Barton #

d. Lateral condyle of humerus #

17.Collie's fracture is classified by
a. Gustilo
b. Neer
c. Frykman
d. Tronzo

18.Baseball finger is
a. Flexion deformity of DIP joint
b. Extension deformity of DIP joint
c. Flexion deformity of PIP joint
d. Extension deformity of PIP joint

19.Dislocation of which of the carpal bones can present as median nerve palsy
a. Scaphoid
b. Hamate
c. Lunate
d. Trapezium

20.Most important Sign of Compartment syndrome
a. Pain on passive stretching
b. Numbness
c. Paraesthesia
d. Pallor

21.Which of the following is an indication for open reduction-

a. # Lateral condyle humerus
b. # both bones of forearms
c. # Supracondylar humerus
d. # Femoral condyle

22.Which of the following statements is true?
a. Transverse fracture unites faster than spiral fracture and is stable on compression.
b. Spiral fractures unite more rapidly and are not stable on compression.
c. Comminuted fractures are slow to Join and are stable on compression
d. Bending causes Spiral fractures.

23.Indications for operative treatment of fractures include all except
a. Intra articular fractures
b. Fractures in children
c. Compound fractures
d. Fractures associated with vascular Injury

24.Physeal injuries are classified by
a. Gustilo & Anderson
b. Tronzo
c. Salter and Harris
d. Neer

25.Monteggia fracture is
a. Fracture of distal radius with dislocation of inferior radio ulnar joint
b. Fracture of the distal ulna with dislocation of the inferior radio ulnar joint
c. Fracture of the proximal ulna with dislocation of the radial head.
d. Elbow dislocation with coronoid fracture.

26.In Colles fracture, the distal fragment is
a. Shifted dorsally
b. Angulated radially
c. Supinated
d. All of the above

27.Patient comes with fracture femur in a RTA, the first priority is
a. Splinting of fracture
b. Immediate x-ray to r/o associated posterior dislocation

c. Secure airway & treat the shock
d. Prepare for nailing

28.In children, the displacement of fractured fragment in which plane is not remodeled
a. Angulation
b. Side to side displacement
c. Rotation
d. Shortening

29.Following movements are responsible for dislocation of shoulder
a. Abduction & ext. rotation
b. Abduction & int. rotation
c. Flexion & int. rotation
d. Extension

30.Dugas test is done for
a. Fracture neck of femur
b. Ant. Dislocation of shoulder
c. Post dislocation of Hip
d. S/C # of humerus

31.Apprehension sign is present in
a. Perthes disease
b. TB hip
c. Recurrent dislocation of patella
d. Stress fracture

32.A patient had injury to the upper limb 3 years earlier. He now has valgus deformity in the elbow and paresthesia over the medial border of the hand. The injury most likely to have been
a. Supracondylar # humerus
b. Lateral condyle # humerus
c. Medial condyle # humerus
d. Posterior dislocation of the humerus

33.Bennett's fracture is fracture dislocation of base of metacarpal
a. 4^{th}
b. 1^{st}
c. 3^{rd}
d. 2^{nd}

34.All of the following fracture almost always need open reduction and internal fixation except
a. Fracture of lateral condyle of humerus
b. Fracture of olecranon
c. Transverse fracture of patella
d. Fracture of scaphoid

35.The symmetry of 3 point at elbow should be maintained in humerus
a. Supracondylar #
b. Intercondylar #
c. Lateral Condylar # humerus
d. Medial epicondyle #

36.Most common complication in colle's fracture
a. Stiffness of fingers
b. Sudeck's atrophy
c. Nonunion
d. Tendon rupture

37.Tardy ulnar nerve palsy is seen with
a. Medial humeral condyle #
b. Lateral humeral condyle #
c. Fracture capitellum
d. Supracondylar fracture

38.All are excised in severe injury EXCEPT
a. Comminuted # patella
b. Head of radius

c. Olecranon process #
d. Lateral condyle # humerus

39.All of the following fracture require operative reduction, EXCEPT
a. Lateral Condyle of humerus
b. Patella
c. lower 1/3 of radius
d. Olecranon

40.Fracture of both bone forearm at same level, position of the arm in plaster is
a. Full Supination
b. 10° Supination
c. Full pronation
d. Mid prone

41.Treatment of choice is 65 years old female with impacted # neck of humerus is
a. Triangular sling
b. Arm-chest strapping
c. Arthroplasty
d. Observation

42.A 4 year old boy fall from a 2 meter height and complain of pain at the ankle joints, the mother takes him to the hospital, when X-ray of the ankle joints reveals nothing, two years later, the boy develops equines, valgus deformity of the same leg, the cause could be
a. Avascular necrosis of talus
b. Distal epiphyseal fracture
c. Undiagnosed fracture
d. Inferior tibial joint dislocation

43.A father playing with his 2 years old son pulls up by holding both his hands in the air. The child cries out in pain and does not allow the father to touch his hand, cause is
a. Pulled elbow
b. Supra condylar # humerus
c. Dislocation of radial head
d. Posterior dislocation of elbow

44.A fracture of posterior ends of 3rd to 5th ribs on right side requires
a. Analgesic + breathing exercise
b. Strapping + antibiotics
c. Exploration
d. Masterly inactivity

45.Most reliable clinical diagnosis feature of fracture is
a. Local tenderness
b. Loss of function
c. Crepitus
d. Deformity

46.Chemically plaster of Paris is
a. Calcium phosphate
b. Sodium thio sulphate
c. Hemi hydrated calcium sulphate
d. Hydrated calcium sulphate

47.Which of the following statement about shoulder dislocation is not true
a. Usually anterior
b. Radial nerve palsy is most common in anterior dislocation
c. Kocher's maneuver is used to reduce the dislocation
d. Hill Sachs lesions is seen on posterolateral aspect of head of humerus

48.Fracture of clavicle is most common at
a. Junction of medial 1/3rd and lateral 2/3rd
b. Junction of medial 2/3rd and lateral 1/3rd
c. Midpoint
d. Scapular end

49.Tardy ulnar palsy is seen in

a. Ununited fracture lateral condyle of humerus
b. Fracture medial epicondyle of humerus
c. Dislocation of the elbow
d. All of the above

50.Chauffeur's fracture involves
a. Radius
b. Ulna
c. Humerus
d. Vertebra

51.Blood supply of the head of femur is mainly by
a. Artery of ligamentum teres
b. Retinacular artery
c. Nutrient artery
d. Periosteal artery of Hip

52.About displacement of distal fragment in Colles fracture, true is
a. Anteriorly and medially
b. Anteriorly and laterally
c. Posteriorly and laterally
d. Posteriorly and medially

53. Subsequent to a fall, a young man is unable to lift injured upper limb. On inspection, the normal rounded contour of the shoulder is found to have been lost; the upper arm appears longer on the injured side and the acromion is prominent. The most likely diagnosis is
a. Fracture neck of the humerus
b. Anterior dislocation of the shoulder
c. Posterior dislocation of the shoulder
d. Acromioclavicular dislocation

54. Treatment of choice for displaced fracture of radius and ulna in an adult is
a. Plaster for 8 weeks
b. Closed reduction and cast bracing
c. Open reduction and internal fixation
d. Intramedullary nailing

55. Most common type of epiphyseal injury is
a. Type I
b. Type II
c. Type III
d. Type IV

Fractures MCQS 1 Answer key

1. D
2. A
3. D
4. A
5. C
6. A
7. A
8. A
9. C
10. D
11. D

12. D
13. D
14. B
15. A
16. C
17. C
18. A
19. C
20. A
21. A
22. B
23. B
24. C
25. C
26. D
27. C
28. C
29. A
30. B
31. C
32. B
33. B
34. D
35. A
36. A
37. B
38. D
39. C
40. D
41. A
42. B
43. A
44. A
45. C
46. C
47. B
48. B
49. A
50. A
51. B
52. C
53. B
54. C
55. B

Fractures MCQS - 2

1. Which Meniscal injury should be repaired?
    a. Outer third of Meniscus
    b. Middle third of the Meniscus
    c. Inner third of the Meniscus
    d. Meniscal injury with ACL tear

2. An elderly woman was admitted with a fracture of the neck of right femur which failed to unite. On examination an avascular necrosis of the head of femur was noted. The condition would have resulted most probably from the damage to
    a. Superior gluteal artery
    b. Inferior gluteal artery
    c. Acetabular branch of obturator

d. Retinacular branches of circumflex femoral arteries

3. The stability of the ankle joint is maintained by all of the following, except
   a. Planter calcaneonavicular (spring) ligament
   b. Delotoid ligament
   c. Lateral ligament
   d. Shape of the superior talar articular surface

4. You have treated a simple and undisplaced fracture of shaft of right tibia in a nine year girl with above knee plaster cast. Parents want to know the prognosis of union of the fractured limb which was affected by poliomyelitis four years ago. What is the best possible advice will you offer to the parents?
   a. Fracture will unite slowly
   b. Fracture will not unite
   c. Fracture will unite normally
   d. Fracture will unite on attaining puberty

5. Posterior cruciate ligament true statement
   a. prevents posterior displacement of tibia
   b. Intra synovial
   c. Attaches to lateral femoral condyle
   d. Attached anteriorly over Tibia

6. A patient presented with RTA with fracture pelvis, few drops of blood passed per uretherally without passing urine, palpable bladder, and likely cause is
   a. Ureteral injury
   b. Urethral injury
   c. Bladder rupture
   d. Urine extravasation to peritoneum

7. Jones fracture is
   a. # subtrochanteric femur
   b. Avulsion # base of 1^{st} metacarpal
   c. Avulsion # base of 5^{th} metatarsal
   d. # base of 2^{nd} metatarsal

8. Most common cervical spine fracture is of
   a. C1
   b. C2
   c. C4
   d. C5

9. Meyer's operation is done for
   a. Dislocation of patella
   b. Fracture neck of femur
   c. Dislocation of shoulder
   d. Fracture fibula

10. Vascular sign of Narath is positive in
   a. Fracture neck of femur
   b. Posterior dislocation of hip
   c. Perthes disease
   d. Coxa vara

11. Extra capsular fracture neck femur is indicated when there is external rotation of limb of
   a. 15 degree
   b. 45 degree
   c. 60 degree
   d. 90 degree

12. A 9 years old boy is brought by his parents. He has multiple abrasions and ecchymosis over the area of the femur and has spiral fracture. The cause may be
   a. Child abuse
   b. Run over accidents
   c. Hockey injury
   d. Fall from height

13. A 60 years old female lands up in emergency with history of fall with attitude of limb in extension and external rotation. The most probable diagnosis is
    a. Intracapsular # neck femur
    b. Posterior dislocation of hip
    c. Intertrochanteric #
    d. Acetabulum #
14. Shoveler's fracture is
    a. Stress fracture of spinous process
    b. Fracture of forearm bones
    c. Fracture of the body of atlas
    d. Fracture dislocation of axis vertebrae
15. Dislocation without fracture is possible in
    a. Cervical region
    b. Upper dorsal region
    c. Lower sacral region
    d. Lumbodorsal region

16. Bohler's angle is useful in detecting the # of
    a. Calcaneum
    b. Talus
    c. Acetabulum
    d. Thoracic spine
17. A 50 yrs. male with fracture neck of femur comes after 3 days .The treatment of choice is
    a. Hemiarthroplasty
    b. Total hip replacement
    c. Hip spica
    d. Cancellous screws fixation
18. Treatment of choice for 2 weeks old fracture neck of femur in 65 yrs.' old man is-

    a. Hemi replacement arthroplasty
    b. S.P. nailing
    c. McMurray's osteotomy
    d. Total hip replacement
19. Which of the following is correct in medial meniscal tear.-
    a. Rotation of femur on tibia
    b. Menisci do not heal
    c. Locking and unlocking episodes
    d. Menisci should be excised
    e. All of the above are correct
20. Drawer's sign is diagnostic for injuries of
    a. Neck femur
    b. Shaft femur
    c. Collateral ligaments of knee
    d. Cruciate ligaments of Knee
21. In transverse fracture of patella, the treatment is
    a. Excision of a small fragment
    b. Wire fixation
    c. Plaster Cylinder
    d. Patellectomy
22. Most common complication of intertrochanteric femur-

    a. Malunion
    b. Nonunion
    c. Osteoarthritis
    d. Nerve injury
23. Deformity in Anterior dislocation of hip is
    a. Ext. Rotation, Abduction, flexion

b. Ext. Rotation, Adduction, flexion
c. Int. Rotation, Abduction, flexion
d. Int. Rotation, Adduction, flexion

24. Commonest dangerous complication of posterior dislocation of knee is
a. Popliteal artery injury
b. Sciatic nerve injury
c. Ischemia of lower leg compartment
d. Femoral artery injury

25. On accident, there in damage of cervical spine, first line of management** is
a. X-ray
b. Turn head to side
c. Maintain airway
d. Stabilize the cervical spine

26. Deformity in posterior dislocation of hip is
a. Flexion, adduction, Internal rotation
b. Flexion, abduction, external rotation
c. Extension abduction, Internal rotation
d. Extension adduction, external rotation

27. Treatment of Non-union of # shaft femur
a. Open reduction with external fixation
b. Excision of the bone
c. Bone grafting with internal fixation with inter locking Nail
d. All of the following

28. Avascular necrosis of head of femur occurs most commonly after fracture of the femoral neck at
a. Subcapital region
b. Transcervical
c. Subchondral region
d. Trochanteric region

29. Jefferson's # is of
a. C1
b. C2
c. C2 C1
d. C2 C3

30. Fall on heel with fracture calcaneum is associated with commonly
a. Fracture clavicle
b. Fracture vertebrae
c. Fracture femur
d. Fracture humerus

31. Apley's grinding test is used for
a. Ulnar N palsy
b. Median N palsy
c. ACL rupture
d. Torn meniscus

32. The complications of posterior dislocation of hip include following except
a. Femoral nerve injury
b. Traumatic arthritis
c. AVN
d. Sciatic N injury

33. The most common site for ligamentous injuries are those of the
a. Shoulder joint
b. Ankle joint
c. Hip joint
d. Elbow joint

34. Lisfranc dislocation is
a. Posterior dislocation of elbow
b. Lunate dislocation

c. Scaphoid dislocation
d. Tarsometatarsal dislocation

35. A man suffered from dashboard injury. On examination his affected lower limb found short, adducted & internally rotated. The most likely diagnosis is
a. Fracture neck of femur
b. Intertrochanteric fracture
c. Fracture femur
d. Posterior dislocation of hip

36. Pott's fracture is
a. Fracture in a tubercular spine
b. Fracture of the fibular neck
c. Fracture of talus neck
d. Fractures around ankle

37. Lachman's test is used for the diagnosis of
a. ACL rupture
b. Medial meniscus tear
c. Medial collateral ligament tear
d. Tubercular knee

38. Shaft of the femur fracture is associated with loss of blood into the thigh which is approximately
a. 500 ml
b. 750 ml
c. 2500 ml
d. 1000 ml.

39. Avascular necrosis is common in
a. Distal part of scaphoid
b. Fibular head
c. Femoral head
d. Calcaneus

40. Fracture of the pelvis at the pubic rami is usually associated with
a. Perforation of the rectum
b. Avulsion of the ureter
c. Bulbar urethral injury
d. Rupture of membranous urethra

41. A 70-year-old man fell, developed pain in the pelvic region, external rotation and shortening of limb. Diagnosis is
a. Fracture neck femur
b. Fracture pelvis
c. Dislocation of pelvis
d. Trochanteric fracture

42. Mc-Murray's sign is positive in injury to
a. Anterior cruciate ligament
b. Post cruciate ligament
c. Medial meniscus
d. Lateral meniscus

43. Avascular necrosis of a fractured fragment is known to occur after a fracture of all of the following EXCEPT
a. Fracture neck of femur
b. Fracture of scaphoid
c. Fracture of talus
d. Fracture of medial femoral condyle

44. Patient with fracture of lumbar spine is transported in a
a. Neutral supine position
b. Left lateral position
c. Supine hyperextended position
d. None of the above

45. Foot drop results from

a. Tibial nerve injury
b. Femoral nerve injury
c. Common peroneal nerve injury
d. Rupture tendo Achilles

46. The pain around the Hip joint with flexion, adduction & internal rotation of lower limb in a young adult after a road traffic accident is suggestive of

a. Intracapsular fracture of the femoral neck
b. extracapsular fracture of the femoral neck
c. posterior dislocation of Hip
d. Anterior dislocation

Fractures MCQS-2 Answer key

1. A
2. D
3. A
4. C
5. A
6. B
7. C
8. D
9. B
10. B
11. D
12. A
13. C
14. A
15. A
16. A
17. D
18. D
19. E
20. D
21. B
22. A
23. A
24. A
25. D

26. A
27. C
28. A
29. A
30. B
31. D
32. A
33. B
34. D
35. D
36. D
37. A
38. D
39. C
40. D
41. D
42. CD
43. D
44. A
45. C
46. C

Bone & Joint Infection MCQS

1. False about Tubercular Osteomyelitis

a. Abundant Periosteal reaction
b. Sequestrum present
c. Signs of Inflammation less common
d. Secondary infection

2. Kanavel's sign is seen in:

a. Tenosynovitis
b. Dupuytren's contracture
c. Carpal tunnel syndrome
d. Trigger finger

3. Tuberculosis of the spine commonly affects all of the following parts of the vertebra except

a. Body
b. Lamina
c. Spinous process
d. Pedicle

4. Sequestrum is a

a. Bone graft
b. New bone
c. Dead bone surrounded by infected granulation tissue
d. Woven bone

5. Which part of the bone is usually involved in acute hematogenous Osteomyelitis

a. Epiphysis
b. Metaphysis
c. Diaphysis
d. Area of nutrient artery distribution

6. Dead bone is recognized on X-rays because

a. More radiolucent than normal
b. More radiopaque
c. Osteophytes grow out from it

d. It has soap bubble appearance

7. Commonest site for acute Osteomyelitis infant is
   a. Tibia
   b. Femur
   c. Hip joint
   d. Shoulder
8. Brodie's abscess is seen in
   a. Flat bones
   b. Long bones
   c. Vertebral bone
   d. Short bones
9. Which of the following is not associated with chronic Osteomyelitis
   a. Sequestrum
   b. Myositis ossificans
   c. Cloacae
   d. Amyloidosis
10. Following are true of Garré's sclerosing Osteomyelitis except
   a. Tibia commonest site
   b. Thick foul smelling pus
   c. Radio logically dense lesions
   d. Common in children
11. The end result of Tom smith Arthritis is
   a. Ankylosed joints
   b. Fibrosis ankylosis
   c. Hypermobile joint
   d. None of the above
12. When does the lesion of acute Osteomyelitis appear in X – rays?
   a. 2 hours
   b. 24 hours
   c. 9 days
   d. 3 weeks
13. The sequelae of tuberculosis arthritis of hip is usually
   a. Bony ankylosis
   b. Charcot's joints
   c. Fibrous ankylosis
   d. None of the above
14. Earliest manifestation of spinal TB is
   a. Cold abscess formation
   b. Paraplegia
   c. Gibbus
   d. Muscle spasm
15. Tom Smith arthritis involves
   a. Head of Femur
   b. Knee joint
   c. Head of humerus
   d. Elbow
16. Following are complications of acute Osteomyelitis except
   a. Septicemia
   b. Septic Arthritis
   c. Sinus tract malignancy
   d. Osteonecrosis
17. 15-year-old is diagnosed to have tuberculous synovitis lt hip joint. The characteristic posture would be
   a. Flexion, adduction, internal rotation
   b. Extension, abduction
   c. Extension, adduction
   d. Flexion, abduction & extension rotation

18. Commonest site of involvement in TB hip is
    a. Greater trochanter
    b. Ward's diagnosis
    c. Babcock's diagnosis
    d. Acetabular roof
19. Most common cause of bony ankylosis is
    a. Traumatic
    b. Pyogenic infection
    c. Tuberculosis
    d. Rheumatoid
20. Which of the following modality is used for managing tubercular arthritis of the hip joint
    a. Joint debridement
    b. Hip arthrodesis
    c. Girdlestone arthroplasty
    d. All of the above

Bone & Joint Infection Answer key

1. A
2. A
3. D
4. C
5. B
6. B
7. A
8. B
9. B
10. B
11. C
12. C
13. C
14. D
15. A
16. C
17. D
18. D
19. B
20. D

Arthritis & Congenital Disorders MCQS

1. Pollicization of thumb
    a. Reconstruction of thumb
    b. Shortening of finger
    c. Amputation of thumb
    d. Reconstruction of finger from thumb
2. A 2-year-old child is diagnosed having congenital dislocation of hip on right side. His gait would be
    a. Antalgic gait
    b. Ankylosed gait
    c. Calcaneus gait
    d. Trendelenburg gait
3. All of the following statements are true about Developmental Dysplasia of Hip except
    a. more common in females

b. Oligohydramnios is associated with a higher risk of DDH
c. The hour glass appearance of the capsule may prevent a successful closed reduction
d. Twin pregnancy is a known risk factor

4. Commonest presentation of congenital dislocation of knee is
a. Varus
b. Valgus
c. Flexion
d. Extension

5. In a new borne child, abduction and internal rotation produces a click sound. It is known as
a. Ortolani's sign
b. Barlow's sign
c. Lachman's sign
d. Mac Murray's sign

6. Club foot is seen in a 15 year's old could be treated successfully by-
a. Appropriate footwear
b. Soft tissue operation
c. Triple arthrodesis
d. Quadruple fusion

7. Dorsiflexion of foot before correction of other factors in clubfoot commonly results in:
a. Flat foot
b. Rocker bottom foot
c. Claw foot
d. Equinus deformity

8. Madelung's deformity pertains to
a. Spine
b. Chest wall
c. Hip
d. Wrist

9. Congenital bilateral dislocation of hip shows
a. Waddling
b. Lordosis
c. Positive Trendelenburg test
d. All of the above

10. Rocker bottom foot results from
a. Congenital vertical talus
b. Poliomyelitis
c. Club foot over correction
d. Spina bifida

11. Which of the following is not seen in bilateral congenital dislocation of hip
a. Waddling gait
b. Shenton's line is broken
c. Trendelenburg test positive
d. Allis test positive

12. Congenital dislocation of the hip is common in
a. Boys
b. Breech presentation
c. Second born child
d. All of the above

13. Investigation of choice for diagnosis of CDH at birth
a. Radiographs
b. Bone scan
c. Hematological
d. Ultrasound

14. Following illness are common in males than females except
a. CTEV
b. Ankylosing spondylitis

c. Gout
d. CDH

15. In correction of clubfoot by manipulation, which deformity should be corrected first
    a. Forefoot adduction
    b. Varus
    c. Equinus
    d. Internal tibial torsion
16. Child aged 3 1/4 years treated by CTEV with
    a. Triple arthrodesis
    b. Posteromedial soft tissue release
    c. Lateral wedge resection
    d. Tendo achillis lengthening and posterior capsulotomy
17. Which test is done for diagnosis of congenital dislocation of hip
    a. Barlow's test
    b. Ober's test
    c. Trendelenburg test
    d. Thomas test
18. Which one of the following splints used in treatment of congenital dislocation of hip
    a. Von Rosen's splint
    b. Volkmann's splint
    c. Denis brown splint
    d. Böhler-Braun splint
19. Congenital vertical talus in a child of 1 year age is best managed by
    a. Open reduction
    b. Corrective cast splinting
    c. Triple arthrodesis
    d. Calcaneal osteotomy
20. Pavlik harness is used in
    a. CDH
    b. CTEV
    c. Scoliosis
    d. Torticollis
21. Allis sign is seen in
    a. CDH
    b. Osteoarthrosis
    c. Pott's spine
    d. Marfan's syndrome
22. A new born with, telescoping positive on the left hip, muscle wasting and shortening of left lower limb has
    a. Tuberculosis of hip
    b. Congenital dislocation of hip
    c. Fracture neck of femur
    d. Polio
23. In clubfoot, the deformity involves
    a. Foot only
    b. Foot and ankle joint
    c. Foot, ankle joint and leg
    d. Foot, ankle joint, leg and knee joint
24. In club foot all of the following deformities are seen except
    a. Equinus at ankle
    b. Vertical talus
    c. Forefoot-adduction
    d. Varus at heel
25. Osteo arthritis of knee leads to weakness of mainly:
    a. Hamstring
    b. Quadriceps
    c. Both A & B

d. Gastrocnemius

26. Erosive arthritis is seen in all except
    a. Gout
    b. Psoriatic arthritis
    c. Rheumatoid arthritis
    d. SLE
27. Intervertebral disc calcification seen in
    a. Gout
    b. Alkaptonuria
    c. Osteoarthritis
    d. Psoriasis
28. Pseudogout differs from gout in all aspects except
    a. Large joints involvement
    b. Normal uric acid
    c. Weakly positive birefringent crystals
    d. Needle shaped crystals
29. In rheumatoid arthritis the pathology starts in
    a. Articular cartilage
    b. Synovium
    c. Capsule
    d. Muscles
30. Which of the following joint is involved in early stages of Ankylosis spondylitis
    a. Hip joint
    b. Intervertebral joint
    c. Sacroiliac joint
    d. Knee joint
31. Hyperextension of PIP joints & hyperflexion of DIP joint is knows as
    a. Swan neck deformity
    b. Mallet finger
    c. Boutonniere's deformity
    d. Trigger finger
32. Earliest visible change in osteoarthritis is
    a. Loss of water
    b. Fibrillation
    c. Decreased collagen content
    d. Decreased hyaluronic acid
33. Radiological sign of osteoarthritis include all except
    a. Juxta articular cysts
    b. Marginal osteophytes
    c. Subchondral sclerosis of bone
    d. Widening of the joint surface
34. Bamboo spine is seen in
    a. Ankylosing spondylitis
    b. Rheumatoid arthritis
    c. Scheuermann's disease
    d. Pott's spine

Arthritis & Congenital Disorders Answer key

1. A
2. D

3. D
4. D
5. A
6. C
7. B
8. D
9. D
10. A
11. D
12. B
13. D
14. D
15. A
16. B
17. A
18. A
19. A
20. A
21. A
22. B
23. C
24. B
25. B
26. D
27. B
28. D
29. B
30. C
31. A
32. B
33. D
34. A

Bone Neoplasia MCQS

1. Staging of bone tumors is done by:
    a. Enneking
    b. Manchester
    c. Edmonton
    d. TNM

2. An 18-year-old female presented with a distal femoral lesion. Staging studies showed the lesson to arise from the femur with soft – tissue extension into the anterior compartment of the thigh. The bone scan & CT showed no evidence of distant metastasis – An incisional biopsy revealed a high – grade osteosarcoma. The stage is
    a. I – A
    b. I – B
    c. II – A
    d. II – B

3. A 58 years old woman, who had backache and recurrent chest infections for last 6 months, develops sudden weakness of the legs and urinary retention. Her investigations show a hemoglobin of 7.3 gm/dl, serum calcium 12.6mg/dl, phosphate 2.5mg/dl, alkaline phosphatase 100u/l , serum albumin 3g/ dl, globulin 7.1 g/dl & urea 178mg/dl. What is the most likely diagnosis?
    a. Lung cancer
    b. Disseminated tuberculosis
    c. Multiple myeloma
    d. Osteoporosis

4. Which of the following condition is least likely to present as an eccentric osteolytic lesion

a. Aneurysmal Bone Cyst
b. Giant cell tumor
c. Fibrous cortical defect
d. Simple bone cyst

5. All the statements are true about exostosis, except
a. it occurs at growing end of bone
b. growth continues after skeletal maturity
c. It is covered by cartilaginous cap
d. Malignant transformation may occur

6. All of the following ate the causes of sudden increase in pain in osteochondroma , except
a. Degenerative changes
b. Bursitis
c. Fracture
d. Sarcomatous change

7. Management plan for ostogenic sarcoma of the lower end of femur must include
a. Radiotherapy – amputation- chemotherapy
b. Surgery alone
c. Chemotherapy – limb salvage surgery- chemotherapy
d. Chemotherapy – radiotherapy

8. Which of the following tumors involves epiphysis?
a. Ewings sarcoma
b. Osteosarcoma
c. Osteoclastoma
d. Chondromyxoma

9. Commonest site of chondroblastoma
a. Diaphysis
b. Periosteum
c. Metaphysis
d. Epiphysis

10. Radiologically soap bubble appearance is seen in
a. Osteogenic sarcoma
b. Chondrosarcoma
c. Osteoclastoma
d. Ewing's sarcoma

11. Most radiosensitive bone tumor is
a. Chondrosarcoma
b. Osteoclastoma
c. Ewing's sarcoma
d. Osteosarcoma

12. Histology of Ewing's sarcoma shows small round cells. These cells are filled with
a. Glycogen
b. Mucin
c. Fat
d. Iron

13. The most common site of origin of an osteoid osteoma is
a. Spine
b. Diaphysis of long bones
c. Skull
d. Pelvis

14. An osteoblastoma histologically resemble closely to
a. Osteoclastoma
b. Osteosarcoma
c. Chondrosarcoma
d. Osteoid Osteoma

15. Osseous hemangiomas commonly occur in
    a. Small bones of the hand
    b. Vertebral bodies
    c. Tibial diaphysis
    d. Pelvis
16. Physaliferous cells are pathognomic of
    a. Chondrosarcoma
    b. Ameloblastoma
    c. Chordoma
    d. Ewing's sarcoma
17. A 10-year-old child presents with a mass on his thigh arising form diaphysis & involving the soft tissues, the child is having fever also. The most probable diagnosis is
    a. Osteosarcoma
    b. Chondrosarcoma
    c. Ewing's sarcoma
    d. Osteoid Osteoma
18. Adamantinoma of limb bones are most frequently found in
    a. Humerus
    b. Femur
    c. Tibia
    d. Radius
19. Pain in osteoid Osteoma is specifically relieved by
    a. Radiation
    b. Narcotics
    c. Splinting
    d. Salicylates
20. Myeloma is commonly associated with all of the above except
    a. Multiple punched out lesions
    b. Hypercalcemia
    c. Raised alkaline phosphatase
    d. Raised ESR
21. Commonest benign bone tumour is
    a. Osteochondroma
    b. Osteoid Osteoma
    c. Simple bone cyst
    d. Osteoma
22. Osteogenic sarcoma can develop in
    a. Paget's disease
    b. Osteoid Osteoma
    c. Chondroblastoma
    d. All of the above
23. Fibrous dysplasia of bone with precocious puberty & pigmentation is seen in
    a. Adrenal hypoplasia
    b. Achondroplasia
    c. Albright's syndrome
    d. Gardner's syndrome
24. A boy presenting with swelling at lower end femur with calcified, nodular shadow in lung has
    a. Osteochondroma
    b. Tuberculosis femur lower end
    c. Osteosarcoma
    d. Osteomyelitis
25. Most common mode of metastasis in osteogenic sarcoma
    a. Lymphatic
    b. Hematogenous

c. Transcortical
d. Subperiosteal spread

26. Following are true of simple bone cyst except
a. Common in age group 40-60
b. Upped end of humerus – commonest site
c. Usually asymptomatic
d. Cyst fluid contains cholesterol crystals

27. Following are true of chordoma except
a. Locally malignant
b. Forms very large tumor mass
c. Large osteolytic areas with calcification
d. Most common over thoracic spine

28. A 8-year-old boy presents with fracture of upper end humerus. X ray reveals a lytic lesion at the upper end. The likely diagnosis is
a. Grant cell tumor
b. Osteochondroma
c. Osteosarcoma
d. Unicameral bone cyst

29. Codman's tumor refers to
a. Chondroblastoma
b. Chondrosarcoma
c. Enchondroma
d. Osteosarcoma

30. Bone tumor metastasizing to bone is
a. GCT
b. Chondrosarcoma
c. Osteosarcoma
d. Ewing's sarcoma

Bone Neoplasia Answer key

1. A
2. D
3. C
4. D
5. B
6. A
7. C
8. C
9. D
10. C
11. C
12. A
13. B
14. D

15. B
16. C
17. C
18. C
19. D
20. C
21. A
22. A
23. C
24. C
25. B
26. A
27. D
28. D
29. A
30. D

Nerve injuries & Neurology MCQS

1. Best prognosis after repair
    a. Radial Nerve
    b. Median Nerve
    c. Sciatic Nerve
    d. Ulnar Nerve
2. Ulnar injury in the arm leads to all except:
    a. Sensory loss of the medial 1/3rd of the hand
    b. Weakness of the hypothenar muscles
    c. Claw hand
    d. Adductor pollicis paralysis
3. Meralgia paraesthetica involves
    a. Medial cutaneous nerve
    b. Lateral cutaneous nerve of thigh
    c. Sciatic N
    d. Sural N
4. Common peroneal nerve related to
    a. Neck of fibula
    b. Lateral condyle of Tibia
    c. Shaft of fibula
    d. Medial Condyle of Tibia
5. Cock up splint is used for
    a. Ulnar nerve injury
    b. Radial nerve injury
    c. Axillary nerve injury
    d. Median nerve injury
6. 'Card test' is done for
    a. Median nerve
    b. Ulnar nerve
    c. Axillary nerve
    d. Radial nerve
7. Post Injection radial nerve palsy is characterized by
    a. wrist drop
    b. Loss of extension of thumb
    c. Loss of extension of MP joints of fingers
    d. All of the above
8. Policeman tip hand is seen in
    a. Radial nerve palsy

b. Erb's palsy
c. Median nerve palsy
d. Klumpke's palsy

9. Posterior interosseous nerve injury leads to
   a. Claw hand
   b. Wrist drop
   c. Finger drop
   d. Ape like hand

10. Equinus deformity in post polio residual paralysis is done to weakness of
   a. Plantar flexors
   b. Dorsiflexors
   c. Evictors
   d. Invertors
11. Ape thumb deformity occurs due to injury to
   a. Median nerve
   b. Ulnar nerve
   c. Musculocutaneous nerve
   d. Radial nerve
12. Froment's sign is positive in lesions of
   a. Median nerve
   b. Radial nerve
   c. Ulnar nerve
   d. None of the above
13. Saturday night paralysis is which type of nerve injury
   a. Neuropraxia
   b. Neurotmesis
   c. Axonotmesis
   d. All of the above
14. Which nerve injury causes pointing index finger
   a. Median
   b. Ulnar
   c. Radial
   d. Axillary
15. Nerve responding best to repair is
   a. Median
   b. Radial
   c. Sciatic
   d. Ulnar
16. Total claw hand is caused by injury to
   a. Ulnar only
   b. Ulnar & radial
   c. Ulnar & median
   d. Radial & median
17. Winging of the scapula is usually due to
   a. Long thoracic nerve
   b. Circumflex nerve
   c. Radial nerve
   d. Lateral pectoral nerve
18. Delayed ulnar palsy occurs in fracture of humerus at
   a. Supracondylar
   b. Medial epicondyle
   c. Lateral condyle
   d. Shaft

19. The nerve most usually to be injured in fracture of upper end of radius is

a. Median
b. Ulnar
c. Posterior interosseous
d. Any of the above

20. Thumb in palm deformity is characteristically seen in
    a. Poliomyelitis
    b. Cerebral palsy
    c. Radial nerve injury
    d. All of the above
21. Loss of finger counting movements is due to injury of
    a. Radial nerve
    b. Ulnar nerve
    c. Median nerve
    d. Posterior interosseous nerve
22. The spastic child usually exhibits
    a. Ataxic gait
    b. Scissoring gait
    c. Fixed hip gait
    d. Trendelenburg gait
23. Nerve regeneration can be clinically monitored with
    a. Phalen's test
    b. Finkelstein test
    c. Tinel's test
    d. All of the above
24. A 30-year-old man suffers from post injection radial nerve palsy. His nerve injury would be classified as
    a. Axonotmesis
    b. Neurotmesis
    c. Neuropraxia
    d. None of the above
25. Which of the following is not true about neuropraxia
    a. Physiological injury to a nerve
    b. Transient paralysis
    c. No reaction of degeneration
    d. Motor march present
26. Tardy ulnar nerve palsy occurs as a non union of
    a. Supracondylar fracture of humerus
    b. Olecranon #
    c. Fracture – Lateral condyle of humerus
    d. Posterior dislocation of elbow

27. The nerve compressed in Guyon's canal is
    a. Radial Nerve
    b. Posterior interosseous N
    c. Median Nerve
    d. Ulnar Nerve

Nerve injuries & Neurology Answer key

1. A
2. C
3. B
4. A

5. B
6. B
7. D
8. B
9. C
10. B
11. A
12. C
13. A
14. A
15. B
16. C
17. A
18. C
19. C
20. B
21. C
22. B
23. C
24. B
25. D
26. C
27. D

Miscellaneous MCQS

1. False about Myositis ossificans
    a. Pneumonia is common
    b. Life longetivity is normal
    c. Due to involvement of bone morphogenic factor
    d. Torticollis may be seen
2. Which waves are not used for deep seated heat therapy?
    a. Ultra sonic wave
    b. Short wave diathermy
    c. Micro wave diathermy
    d. Infrared
3. Pain & tenderness over the lateral condyle of humerus with a painful dorsiflexion of the wrist is indicative of
    a. Golfer's elbow
    b. Tennis Elbow
    c. Pitcher's Elbow
    d. Cricket Elbow
4. Sever's disease refers to osteochondritis of
    a. Calcaneum
    b. Radius
    c. Talus
    d. Capitulum
5. Thomas test is useful for evaluation of
    a. Abduction contracture at hip joint
    b. Fixed flexion deformity hip joint
    c. Amount of scoliosis
    d. Fixed flexion deformity at knee joint
6. Osteochondritis of lunate is called
    a. Köhler ds
    b. Panner
    c. Freiberg
    d. Keinböck
7. Bankart's lesion is seen in

a. Anterior glenoid cavity
b. Posterior glenoid cavity
c. Anterior border of head of humerus
d. Posterior border of head of humerus

8. Arthrodesis is not done in children < 12 years old because
a. Deformity may recur
b. Deformity can't be corrected fully
c. Shortening of limb will occur
d. Instability will occur

9. Triple arthrodesis refers to fusion of-

a. Calcaneocuboid, Talonavicular and subtalar
b. Calcaneocuneiform, Subtalar and ankle
c. Calcaneocuneiform, talonavicular and ankle
d. Calcaneo-cuboid, ankle and subtalar

10. Cozens test is positive in
a. Tennis elbow
b. De-Quervain's disease
c. Carpal tunnel syndrome
d. Ulnar bursitis

11. TRUE about trigger finger is
a. Constriction of the fibrous digital sheath
b. Pain and swelling in radial styloid process
c. Inflammation is at the origin of the flexor tendons of the medial epicondyle
d. Causes compression of the median nerve

12. Commonest cause of loose body in knee joint is
a. Osteoarthritis
b. Chondromatosis
c. Fibroid myxomatosis
d. Synovial osteochondritis

13. Cruciate ligament of knee prevents
a. Forward and backward rolling movements of tibia on femur
b. Forward and backward rolling fibula on femur
c. Abduction at knee joint
d. Adduction of knee joint

14. Tendons affected by de Quervain's tenosynovitis are
a. Extensor pollicis longus and abductor pollicis
b. Extensor pollicis brevis and abductor pollicis
c. Extensor pollicis brevis and extensor carpi radialis longus
d. Extensor pollicis longus and extensor pollicis brevis

15. Raised anterior superior iliac spine in adduction deformity of hip can be leveled by
a. Tilting the pelvis
b. Abducting the normal limb
c. Adducting the normal limb
d. Adducting the affected limb

16. Cramer wire is a
a. Splint
b. Skeletal traction device
c. Internal fixation device
d. External fixator

17. Osgood- Schlatter disease affects the
a. Upper end of the tibia
b. Lower end of the tibia
c. Distal end of the femur
d. Proximal end of the femur
e. Patella

18. Genu Varus deformity is caused by shortening in which of the following structures
    a. Medial collateral ligament
    b. Lateral collateral ligament
    c. Anterior cruciate ligament
    d. Posterior cruciate ligament
19. Positive Thomas test indicates
    a. Fixed flexion deformity of hip
    b. Fixed adduction deformity of hip
    c. Real supra trochanteric shortening
    d. Fixed external rotation deformity
20. Which of the following is not true about coxa vara
    a. Positive telescoping movements test
    b. Positive Trendelenburg test
    c. Decreased femoral neck shaft angle
    d. Decreased internal rotation and abduction at hip
21. Dupuytren's contracture most commonly involves
    a. Thumb
    b. Ring finger
    c. Middle finger
    d. Little finger
22. In vertebroplasty/ Kyphoplasty what is injected
    a. Poly ethyl Methacrylate
    b. Poly methyl Methacrylate
    c. Isoethyl Methacrylate
    d. Isoethyl Methacrylate
23. Insertional type of Achillis tendinitis is seen in
    a. Chronic repetitive stain
    b. Improper shoes
    c. Local Steroid injection
    d. Jumping and running
24. Risser localizer cast is used in
    a. Lumber scoliosis
    b. Kyphoscoliosis
    c. Thoracolumbar scoliosis
    d. Spondylolisthesis
25. Transient synovitis (toxic synovitis) of the hip is characterized by all of the following except
    a. May follow upper respiratory tract infection
    b. ESR and white blood cell counts are usually normal
    c. ultrasound of the joint reveals widening of the joint space
    d. The hip is typically held in adduction and internal rotation
26. Not seen in rickets in infancy
    a. Bow legs
    b. Craniotabes
    c. Rachitic Rosary
    d. Wide open Fontanelle
27. All are features of disc prolapse at L4-5 level *except*
    a. Absent ankle jerk
    b. No reflex change
    c. Weakness of EHL
    d. Loss of sensation on dorsum of foot including big toe
28. Which one of the following tests will you adopt while examining a knee joint where you suspect an old tear of anterior cruciate ligament?
    a. Anterior drawer test
    b. Mc Murray test
    c. Lachman's test
    d. Pivot shift test

29. Which activity will be difficult to perform for a patient with an anterior cruciate deficient knee joint?
    a. Walk downhill
    b. Walk uphill
    c. Sit cross leg
    d. Getting up from sitting
30. Which statement is TRUE regarding genu varum (bow leg?)
    a. In infants, it may be considered normal
    b. Occurs due to epiphyseal Dysplasia
    c. Seldom associated with tibial angulation
    d. Affects only the tibia, but never the femur
31. A 30-year-old person falls and sustains injury following which he develops complete claw hand. The spinal segment affected is
    a. $C_{5,6}$
    b. $C_{6,7}$
    c. $C_{7,8}$
    d. C_8T_1
32. Schober's test is done for
    a. Flexion of spine
    b. Extension of spine
    c. Lumbar disc prolapse
    d. Spinal stenosis

33. In disc prolapse at C5-6, which of the following nerve root is pressed?
    a. C_5
    b. C_6
    c. C_7
    d. C_8
34. Normal disc space with collapse of L_{2-3} is seen in
    a. Malignancy
    b. Trauma
    c. Tuberculosis
    d. Congenital defect
35. Disc prolapse is most common at
    a. L_{3-4}
    b. L_{4-5}
    c. L_5S_1
    d. $T_{12}L_1$

Miscellaneous Answer key

1. B
2. D
3. B
4. A
5. B
6. D
7. A
8. C
9. A
10. A
11. A
12. A
13. A
14. B
15. D
16. A
17. A
18. A
19. A
20. A
21. B
22. B
23. D
24. C
25. D
26. A
27. A
28. A
29. A
30. A
31. D
32. A
33. B
34. A
35. B