

Master degree exam in Orthopedics and Traumatology:
Course Title: Orthopedics and Traumatology
Date: 20 / 04 / 2022
Term: paper I Orthopedics
Time Allowed: 3 hours
Total assessment marks: 270 marks



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SHORT NOTES (80 marks) (10 marks each)

- Q1) Enumerate methods of bone tumor excision.
- Q2) Enumerate characteristics of osteoid osteoma
- Q3) Indications and goals of radial head arthroplasty
- Q4) Enumerate diagnostic criteria for rheumatoid arthritis.
- Q5) Possible causes of snapping hip syndrome (SHS)
- Q6) Principles of the Ponseti method for correction of talipes equinovarus deformity in children.
- Q7) Enumerate symptoms and signs of pronator teres syndrome
- Q8) Diagnosis of osteitis fibrosa cystica



Sixty MCQ questions to be answered (180 marks) (3 marks each):

1. Osteoporosis results in:

- a) Increase in skeletal mass
- b) Decrease in the amount of mineralized bone
- c) No change in the mineral to matrix ratio
- d) Decrease in the cortical diameter of a long bone
- e) Increase in bone mineral density by DEXA scanning

2. Paget's disease of bone is:

- a) A disease of decreased bone turnover
- b) Common in young males
- c) Rarely seen in the skull
- d) Is most common in the foot
- e) None of the above

3. Bone as a tissue:

- a) Is largely devoid of cells
- b) Contains more water than cartilage
- c) Contains type II collagen in its ground substance
- d) Depends on its lamellar structure for strength
- e) Has amorphous calcium phosphate as its major mineral constituent

4. Causes of rickets include all except:

- a) Sprue
- b) Genetic renal tubular defects
- c) Vitamin C deprivation
- d) Dilantin therapy
- e) Renal phosphate retention

5. Hyaline cartilage:

- a) Is a hypocellular tissue
- b) Depends on the glycosaminoglycans for resiliency
- c) Is primarily water by weight
- d) Is found in diarthrodial joints
- e) All the above

6. Achondroplasia:

- a) Is an aberration of epiphyseal growth
- b) Is the most common skeletal dysplasia
- c) Is characterized by knock knees
- d) Is often associated with mental retardation
- e) Is fatal in infancy

7. Rheumatoid arthritis:

- a) Is a disease of the articular cartilage
- b) Typically results in hyperostosis around the joints
- c) Commonly causes early fibrosis of the synovium
- d) Is considered a noninflammatory arthritis
- e) Radiographically is characterized by juxtaarticular osteopenia



8. All the following are characterized by generalized osteopenia on the radiograph except:

- a) Gout
- b) Hyperparathyroidism
- c) Osteomalacia
- d) Multiple myeloma
- e) Osteoporosis

9. Avascular necrosis of bone:

- a) Can result from exogenous steroid administration
- b) Is characterized by relative radiodensity
- c) Can involve the femoral head and talus among other bones
- d) Can be associated with sickle cell disease
- e) All the above

10. Carcinomas tend to grow in an invasive manner, infiltrating surrounding soft tissues.

Sarcomas —

- a) Grow in a ball-like manner and typically compress surrounding
- b) tissues
- c) Behave exactly like carcinomas and always grow invasively
- d) Immediately spread to the lymph nodes and metastasize through
- e) the lymphatic system
- f) None of the above

11. When performing a biopsy, the preferred approach would include:

- a) An open or incisional biopsy to obtain a large amount of tumor
- b) A fine-needle aspirate of the fluid surrounding the tumor
- c) Biopsy is typically not indicated for sarcomas because typically radiographs and staging studies are conclusive
- d) A core-needle biopsy in the same anatomic planes as any planned surgical resection
- e) None of the above

12. When evaluating a plain radiograph of a patient with a suspected osteosarcoma, the following characteristics may be seen with regard to the affected bone:

- a) Intramedullary sclerosis and/or cortical destruction
- b) Periosteal elevation
- c) Extrasosseous extension with ossification
- d) a, b, and c
- e) a, and b

13. The most common location of origin of an osteosarcoma is:

- a) The distal femur
- b) The acetabulum
- c) The spine
- d) The ribs

14. Benign bone tumors should be surgically removed under which of the following circumstances?

- a) There is a pathologic fracture
- b) They are painful
- c) They have the potential to undergo malignant transformation or have recurred
- d) All of the above
- e) None of the above



15. Skeletal dysplasias:

- a) Are focal abnormalities of the skeleton
- b) Are frequently hereditary
- c) Rarely involve the craniofacial structures
- d) Are typically due to a vitamin deficiency
- e) Are not associated with angular deformity of the knees

16. Developmental dysplasia of the hip:

- a) Is multifactorial in origin
- b) Is more common in females
- c) Usually involves the left hip
- d) All of the above
- e) None of the above

17. The periosteum:

- a) Is osteogenic in the child
- b) Usually blocks fracture reduction
- c) Is of no mechanical significance
- d) Is a cartilaginous membrane
- e) Extends over the articular surface

18. The physis:

- a) Is the strongest structure of a long bone
- b) Has three zones
- c) Is critical for growth in girth of the diaphysis
- d) Is rarely fractured
- e) Is the site of pathology in achondroplasia

19. Slipped capital femoral epiphysis:

- a) Is more common in thin children
- b) Usually is classified as stable versus unstable
- c) Is often treated by femoral osteotomy
- d) Causes an internal rotational deformity of the hip
- e) Presents as a painless limp

20. Avascular necrosis of the femoral head can be seen in:

- a) Perthes' disease
- b) Developmental dysplasia of the hip
- c) Slipped capital femoral epiphysis
- d) All of the above
- e) None of the above

21. Which of the following can be the presenting symptoms of patients with cervical myelopathy?

- a) Gait disturbance
- b) Clumsiness and loss of manual dexterity
- c) Weakness in the lower extremities
- d) Urinary incontinence
- e) All the above

22. A unilateral decrease in the triceps reflex is most likely evidence of what clinical syndrome?

- a) C5 radiculopathy
- b) C6 radiculopathy
- c) C7 radiculopathy
- d) Cervical myelopathy
- e) None of the above



23. Weakness of the extensor hallucis longus is evidence of nerve root compression at what level?

- a) L2
- b) L3
- c) L4
- d) L5
- e) S1

24. Spondylolysis (pars defect) is most widely believed to be caused by what?

- a) A congenital defect in the pars
- b) An acute traumatic defect in the pars
- c) A stress fracture of the pars
- d) A benign neoplasm involving the pars
- e) None of the above

25. All the following are treatment options for adhesive capsulitis except:

- a) Arthroscopic rotator cuff repair
- b) Arthroscopic adhesiolysis
- c) Manipulation under anesthesia
- d) Glenohumeral corticosteroid injection
- e) Physical therapy

26. Which of the following is NOT a common finding in cubital tunnel syndrome?

- a) Finger abduction weakness
- b) Numbness over the small finger
- c) Thenar atrophy
- d) Positive Froment's sign
- e) Tinel's sign posterior to the medial epicondyle

27. Treatment options for lateral epicondylitis include which of the following choices?

- a) Corticosteroid injection
- b) Arthroscopic debridement
- c) Counterforce bracing
- d) Physical therapy
- e) All the above

28. Which of the following is not a common symptom in carpal tunnel syndrome?

- a) Night pain
- b) Loss of dexterity
- c) Numbness localized to the small finger
- d) Global numbness in the hand
- e) Weakness of the hand

29. Dislocation after total hip replacement can result from:

- a) Impingement on an anterior osteophyte
- b) Soft tissue laxity
- c) Malposition of the components
- d) Poor patient compliance
- e) All the above



- 30. During the anterior approach to the hip for a total hip replacement, which muscle is partially detached from the greater trochanter?**
- Gluteus medius
 - Gluteus maximus
 - Tensor fascia lata
 - Piriformis
 - Quadratus femoris
- 31. Deep periprosthetic infection after total hip replacement is:**
- An easy complication to treat
 - Can be managed without surgery with antibiotics alone
 - A devastating complication requiring several surgeries and long courses of intravenous antibiotics
 - Associated with good range of motion
 - Less frequent in patients taking oral corticosteroids
- 32. The most common complication after total knee replacement is:**
- Stiffness
 - Infection
 - Instability
 - Deep venous thrombosis
 - Neurovascular injury
- 33. On postoperative day 3 after a total knee replacement, the patient is noted to have an open area of the wound with a black necrotic edge. The most worrisome complication of this clinical situation is:**
- Deep venous thrombosis
 - Infection
 - Poor scar appearance
 - Nerve injury
 - Medial collateral ligament rupture
- 34. Patients with chondromalacia of the patella have which of the following symptoms?**
- Anterior knee pain with prolonged sitting
 - Anterior knee pain when descending stairs
 - Buckling or giving way of the knee with ambulation
 - Crepitus in the anterior aspect of the knee
 - All the above
- 35. Hallux valgus includes:**
- A lateral deviation of the first toe
 - Metatarsus primus varus
 - Medial first metatarsal phalangeal joint exostosis
 - Pronation of the first toe
 - All the above
- 36. What is the most common presenting sign or symptom in an adult with lumbar pyogenic infection?**
- Fever
 - Night sweats
 - Unexplained weight loss
 - Foot drop
 - Back pain



- 37. What does Dual Energy X-ray Absorptiometry (DEXA) testing, as a technique, measure?**
- Qualitative value of core bone mineral content
 - Differentiation of trabecular and cortical bone content
 - Core bone mineral density unchanged by osteoarthritis at or around the site
 - Bone mineral content and soft-tissue composition
 - Bone mineral content and density without need for cross-sectional dimension
- 38. What is the typical MRI signal intensity of bone marrow affected by acute osteomyelitis?**
- Decreased on T₁-weighted imaging, increased on T₁-weighted imaging with gadolinium enhancement, increased on T₂-weighted imaging
 - Decreased on T₁-weighted imaging, increased on T₁-weighted imaging with gadolinium enhancement, decreased on T₂-weighted imaging
 - Increased on T₁-weighted imaging, increased on T₁-weighted imaging with gadolinium enhancement, increased on T₂-weighted imaging
 - Increased on T₁-weighted imaging, increased on T₁-weighted imaging with gadolinium enhancement, decreased on T₂-weighted imaging
 - Increased on T₁-weighted imaging, decreased on T₁-weighted imaging with gadolinium enhancement, decreased on T₂-weighted imaging
- 39. The involucrum is best described as:**
- Necrotic bone within a bed of osteomyelitis
 - Rim of soft tissue enhancement surrounding an infection
 - Reactive new bone formation around a sequestrum
 - Thickened joint capsule following a septic arthritis
 - None of the above
- 40. Which of the following organism is the most common pathogen in pediatric age group osteomyelitis?**
- Streptococcus pneumoniae*
 - Streptococcus viridans*
 - Group-B streptococci
 - Staphylococcus aureus*
 - None of the above
- 41. Plain radiographs begin to demonstrate changes within the bone consistent with osteomyelitis after?**
- 2 days
 - 10 days to 2 weeks
 - 4 weeks
 - 3 months
 - 6 months
- 42. What is the earliest identifiable change consistent with osteomyelitis that may be evident on plain radiographs?**
- Bone destruction
 - Soft tissue swelling
 - Joint effusion
 - Bony sclerosis
 - Bone softening
- 43. Initial management of Achilles tendonitis includes:**
- Nonsteroidal medication
 - Activity modification
 - Physical therapy
 - Corticosteroid injection
 - Surgical debridement



44. In a postganglionic brachial plexus lesion at Erb's point (point of formation of the upper trunk by the C5 and C6 nerve roots), which of the following nerves will still function normally?
- Suprascapular
 - Musculocutaneous
 - Axillary
 - Lateral pectoral
 - Dorsal scapular
45. The posterior circumflex humeral artery and the axillary nerve usually lie in a space bordered superiorly by the
- teres minor, medially by the long head of the triceps, laterally by the humerus, and inferiorly by the teres major.
 - teres major, medially by the humerus, and inferiorly by the teres minor.
 - supraspinatus, inferiorly by the infraspinatus, and posterior to the scapular body.
 - supraspinatus, inferiorly by the scapular body, and covered by the superior transverse scapular ligament.
 - infraspinatus, inferiorly by the teres minor, and laterally by the long head of the triceps.
46. What component (pulley) of the flexor tendon sheath is commonly involved in trigger finger?
- A1
 - A2
 - A4
 - C1
 - C2
47. What is the most common presentation of a benign bone tumor in childhood?
- Pain
 - Deformity
 - Pathologic fracture
 - Presence of a mass
 - Incidental finding*
48. What is the current 5-year survival rate for patients with classic nonmetastatic, high-grade osteosarcoma of the extremity?
- 10%
 - 20%
 - 40%
 - 70%
 - 90%
49. Which of the following tumors is most likely to present with a pathologic fracture in a child?
- Unicameral bone cyst
 - Fibrous cortical defect
 - Osteosarcoma
 - Ewing sarcoma
 - Giant cell tumor



- 50. A 2-week-old infant has been referred for evaluation of movement of the left hip. History reveals that the patient was delivered 6 weeks premature by cesarean section. Examination reveals no fever, and there is mild swelling of the thigh. Passive movement of the hip appears to elicit tenderness and very limited hip motion. A radiograph of the pelvis shows mild subluxation of the left hip. The next step in evaluation should consist of:**
- aspiration of the left hip.
 - application of a Pavlik harness.
 - a gallium scan.
 - an MRI scan of the spine.
 - modified Bryant traction.
- 51. What is the prognosis for ambulation, from best to worst, for patients with an incomplete spinal cord injury?**
- Central cord syndrome, anterior cord syndrome, Brown-Sequard syndrome
 - Central cord syndrome, Brown-Sequard syndrome, anterior cord syndrome
 - Brown-Sequard syndrome, anterior cord syndrome, central cord syndrome
 - Brown-Sequard syndrome, central cord syndrome, anterior cord syndrome
 - Anterior cord syndrome, central cord syndrome, Brown-Sequard syndrome
- 52. What spinal nerves in the cauda equina are primarily responsible for innervation of the bladder?**
- L1, L2, and L3
 - L4 and L5
 - L5 and S1
 - S2, S3, and S4
 - Filum terminale
- 53. Subluxation caused by rheumatoid arthritis is most commonly seen at what level of the cervical spine?**
- Occiput-C1
 - C1-C2
 - C2-C3
 - C3-C4
 - C4-C5
- 54. Which of the following findings is a prerequisite for a high tibial valgus osteotomy for medial compartment arthrosis?**
- Inflammatory arthritis
 - Ligamentous instability
 - Lateral tibial subluxation
 - Preoperative arc of motion of at least 90°
 - Narrowing of the lateral compartment cartilaginous joint space
- 55. During total knee arthroplasty using a posterior cruciate-retaining design, excessive tightness in flexion is noted, while the extension gap is felt to be balanced. Which of the following actions will effectively balance the knee?**
- Resect more distal femur.
 - Resect more anterior tibia.
 - Use a larger femoral component.
 - Use a smaller polyethylene insert.
 - Recess the posterior cruciate ligament.



56. The anterior portal of a hip arthroscopy places what structure at greatest risk for injury?

- a) Ascending branch of the lateral circumflex femoral artery
- b) Ascending branch of the medial circumflex femoral artery
- c) Femoral nerve
- d) Lateral femoral cutaneous nerve
- e) Superior gluteal nerve

57. Varus intertrochanteric osteotomy for coxa valga commonly produces which of the following results?

- a) Decreased abductor lever arm
- b) Increased hip joint reaction force
- c) Increased center edge angle
- d) Abductor lag and lurch
- e) Lengthening of the leg

58. During a posterior cruciate ligament-sacrificing total knee arthroplasty with anterior referencing, 8 mm of distal femur is resected. It is noted that the flexion gap is tight and the extension gap appears stable. What is the next most appropriate step in management?

- a) Cut more proximal tibia.
- b) Cut more distal femur.
- c) Cut both the proximal tibia and distal femur.
- d) Decrease the size of the femoral component.
- e) Decrease the tibial polyethylene insert thickness.

59. Failure of high tibial osteotomy (HTO) is most closely associated with which of the following factors?

- a) Patient age of less than 50 years at the time of surgery
- b) Stable fixation of the osteotomy
- c) Development of deep venous thrombosis postoperatively
- d) Type of osteotomy performed (ie, opening wedge versus dome osteotomy)
- e) Presence of a lateral tibial thrust preoperatively

60. During the implantation of a cementless acetabular component in total hip arthroplasty, a screw in the anterior superior quadrant puts which of the following structures at risk for damage?

- a) Sciatic nerve
- b) Internal iliac vessels
- c) External iliac vessels
- d) Femoral vessels
- e) Obturator vessels

Good Luck