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Knee, Shoulder, Elbow Surgery

ORTHOSPORTS

Elbow Examination Handout Summary

I. History

A. Primary complaint and previous injuries

B. Mechanism of injury

1. Overstretch
   a) Hyperextension, Hyperflexion, Valgus stress, Varus stress
   b) Radioulnar pronation, supination, Radial head distraction
   c) Excessive forceful muscular contraction
   d) Overuse
      (1) Wrist extensor - supinator
         (a) Mechanism / cause:
            weak wrist extensors, incorrect grip on the racket, incorrect grip size on racket, too heavy, too stiff, or strung incorrectly racket, inadequate warm-up or training, hitting the ball to hard, incorrect wrist motion
         (b) Lateral epicondylitis or periostitis
         (c) Tendinitis or strain of wrist extensors, particularly the extensor carpi radialis brevis (over age 35)
         (d) Radial tunnel syndrome or posterior interosseus entrapment
         (e) Rule out cervical radioculopathy-C6 nerve root dysfunction weakness in wrist extensors
      (2) Wrist flexion with Valgus Force at the extending elbow
      (3) Repeated elbow extension with valgus force
      (4) Repeated wrist flexion
      (5) Repeated elbow flexion
   e) Reenacting the Mechanism
   f) Force involved - ask about degree of force
   g) Nature of sport - movements involved in sport skills

C. Pain

1. Location - point with one finger
2. Local pain:
   Local point tenderness: Olecranon bursitis, Lateral epicondylitis, Medial epicondylitis, Muscle strains, Ligament sprains
3. Diffuse pain
3. Onset of pain: Immediate, Gradual onset, 6 to 24 hours
4. Type of pain
   a) Sharp - superficial muscle (common wrist flexors/extensors) superficial ligament (collateral), olecranon bursa, periosteum
   b) Dull Ache - subchondral bone (chronic epicondylitis, chondromalacia), fibrous capsule, chronic bursitis
   c) Tingling (Paresthesia) - Peripheral nerve damage, Nerve root irritation, Circulatory problem
   d) Numbness - cervical nerve root, peripheral cutaneous nerve
   e) Twinges - muscular strain, ligamentous sprain
   f) Stiffness - capsular swelling, arthritic changes, muscle spasms
5. Severity - mild, moderate, severe
6. Timing of pain

7. Aggravating activities
    (1) Gripping increases lateral epicondylitis pain
    (2) Throwing aggravates medial compartment problems
    (3) Repeated pronation/supination aggravates radioulnar joint
    (4) Muscles more painful when stretched or contracted
    (5) Bursa more painful when pinched or compressed
    (6) Internal derangement (osteochondral fx., joint mice, synovitis) aggravated with movements
  b) Alleviating activities

D. Swelling
1. Location
2. Timing

E. Function
1. Range of motion
  a) Immediate ROM indicates normal function
  b) Immediate limitations indicate substantial injury or strong psychological fear
  c) Immediate disability indicates severe injury
  d) Locking - loose body limiting ROM
  e) Weakness - reflex inhibition
  f) Flexion/extension problems - humeroulnar or humeroradial joints
  g) Pronation/supination problems - proximal or distal radioulnar joints
  h) Daily function - how affected gives better idea of problem

F. Sensations
1. Clicking - loose body, secondary to dislocations
2. Grating - osteoarthritic changes (chondromalacia, osteochondritis, osteoarthritis
3. Tingling or Numbness
4. Warmth - active inflammation or infection

II.Observation

1. Arm swing during ambulation
2. Clothing removal

B. Observe posture - Have patient stand with arms by their side to observe the alignment, position, and hanging posture
1. Anterior
  a) Cranial & cervical position, Shoulder position, Anterior glenohumeral joint, AC & SC joints, Thoracic outlet
  b) Elbow joint:
    (1) Carrying angle
    (2) Cubital varus (Gunstock deformity) versus cubital valgus
    (3) Hyperextension
    (4) Biceps atrophy
  c) Forearm - supinated or pronated, muscle hypertrophy/atrophy
  d) Hand
2. Posterior
  a) Shoulder level
  b) Elbow joint - extended (straight line between medial & lateral epicondyles & olecranon process) or flexed (isosceles triangle between medial & lateral epicondyles & olecranon process)

C. Lesion site
1. Swelling - intracapsular, extracapsular, intramuscular, or intermuscular
2. Joint deformity & bony contours
3. Bony exostosis medially or laterally form epicondylitis
4. Muscle atrophy or hypertrophy
5. Skin condition

D. Observe signs of trauma
1. Abrasions
2. Contusions
3. Ecchymosis
4. Redness
5. Scars

III. Palpation

A. For pain, specific tenderness, swelling, effusion, local temperature increase

B. Bony

1. Medial epicondyle
2. Medial supracondylar ridge
3. Trochlea
4. Ulnar nerve groove
5. Olecranon
6. Olecranon fossa
7. Ulnar ridge to styloid process
8. Lateral epicondyle
9. Lateral supracondylar ridge
10. Capitellum
11. Radial head to radial styloid

C. Muscles

1. Triceps & attachments
2. Biceps & attachments
3. Wrist flexors
4. Wrist extensors: “the mobile wad of three”

D. Soft-tissue

1. Medial Aspect
   Ulnar nerve, Ulnar collateral ligament
2. Posterior Aspect
   Olecranon bursa
3. Lateral Aspect
   Lateral collateral ligament, Annular ligament, Radial-humeral bursa
4. Anterior Aspect
   Cubital fossa, Brachial artery, Median nerve, Musculocutaneous nerve

E. Check Sensation

1. C5: lateral arm
2. C6: lateral forearm
3. C7: middle finger
4. C8: 4th & 5th fingers, ulnar side of distal forearm & hand
5. T2: medial arm
6. T1: medial forearm

F. Manual muscle tests

1. Elbow flexion/extension: stabilize elbow & grasp wrist
2. Pronation/supination: with elbow at 90 degrees shake hands or grasp forearm at wrist
3. Wrist flexion/extension: stabilize forearm & grasp hand, for flexion use closed fist, for extension use extended fingers

G. Reflexes

Biceps reflex, Triceps reflex, Brachioradialis reflex

H. Functional Tests

1. Sitting - Bring hand to mouth lifting weight (elbow flexion)
2. Standing 90 cm from wall, leaning against wall - Push arms straight (elbow extension)
3. Standing facing closed door - Open door starting with palm down (supination of arm)
4. Standing facing closed door - Open door starting with palm up (pronation of arm)

I. Stress Tests

IV. Investigations

V. Treatment

D. SHER	knee shoulder and elbow surgery			J.GOLDBERG	shoulder surgery
N.ROWDEN	knee & hip surgery	C. WALLER	hip & knee surgery	R.PATTINSON	paediatric & general
A.LOEFLER	hip, knee & spines	J.NEGRINE	foot & ankle surgery	L.KUO	shoulder, elbow, knee & paediatrics
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