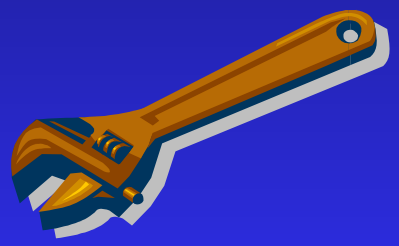
Elbow

Lateral Epicondylitis (tennis elbow)

- Pathology
  - 30 – 50 years old
  - Repetitive micro-trauma
  - Chronic tear in the origin of the extensor carpi radialis brevis

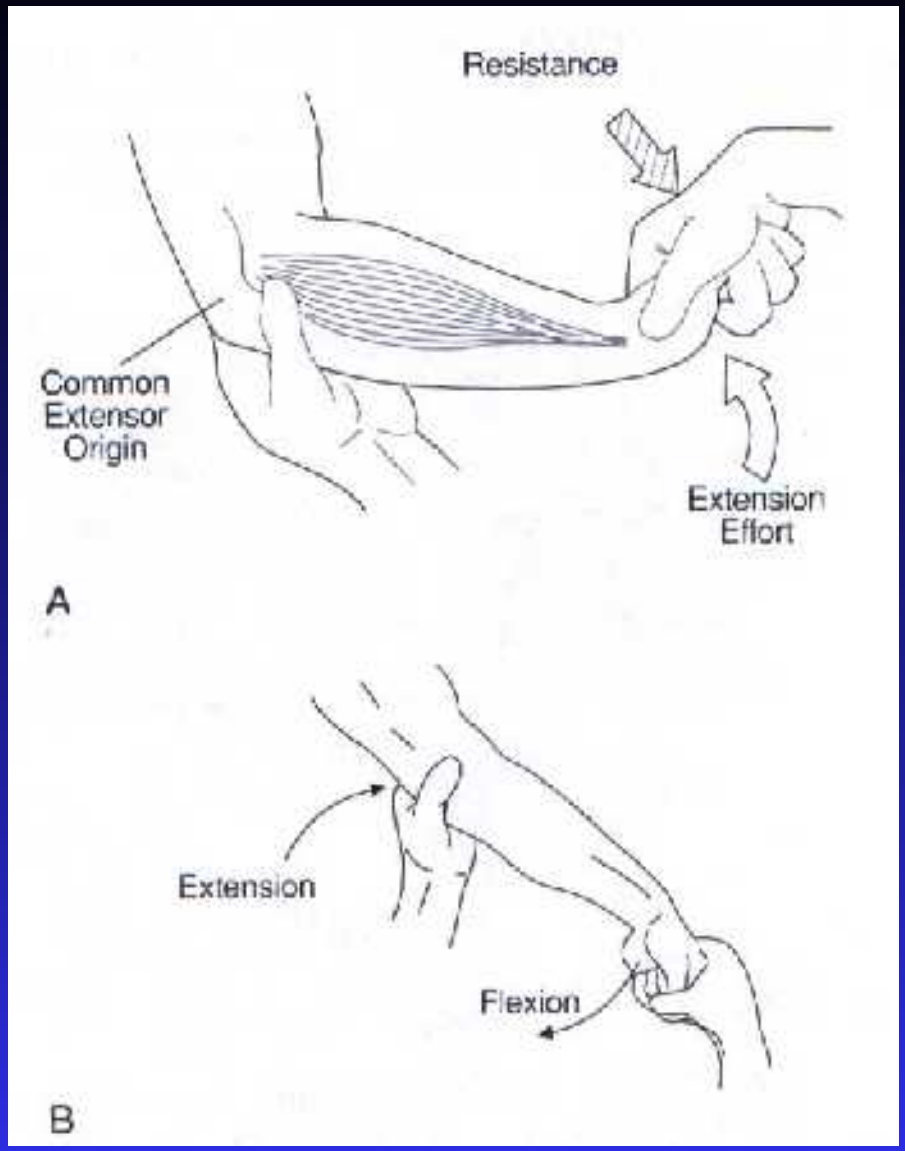
Lateral Epicondylitis (tennis elbow)

- Mechanism of Injury
  - Overuse syndrome caused by repeated forceful wrist and finger movements
  - Tennis players
  - Prolonged and rapid activities



Lateral Epicondylitis (tennis elbow)

- Clinical Signs and Symptoms
  - Increased pain around lateral epicondyle
  - Tenderness in palpation CET
  - Tests
    - AROM; PROM
    - Resisted tests
    - Lidocaine


Resistance
Common
Extensor
Origin
Extension
Effort
A
Extension
Flexion
B

Treatment of Tennis Elbow

Quick Facts

SIGNIFICANT RELIEF OF SYMPTOMS OF LATERAL EPICONDYLITIS[a]

Treatment	*% Relief*
Changing tennis stroke or getting lessons	92
Stretching and strengthening exercises	84
Wearing forearm splint or brace	83
Use of medication	
Aspirin	70
NSAIDs	85
Steroid injection	88
Modalities	
Heat	73
Cold	63
Ultrasound	53
Rest > 1 month	72

[a] Complete relief (lack of recurrence) requires combined, intensive therapy.[35]

Medial Epicondylitis (golfer's elbow)

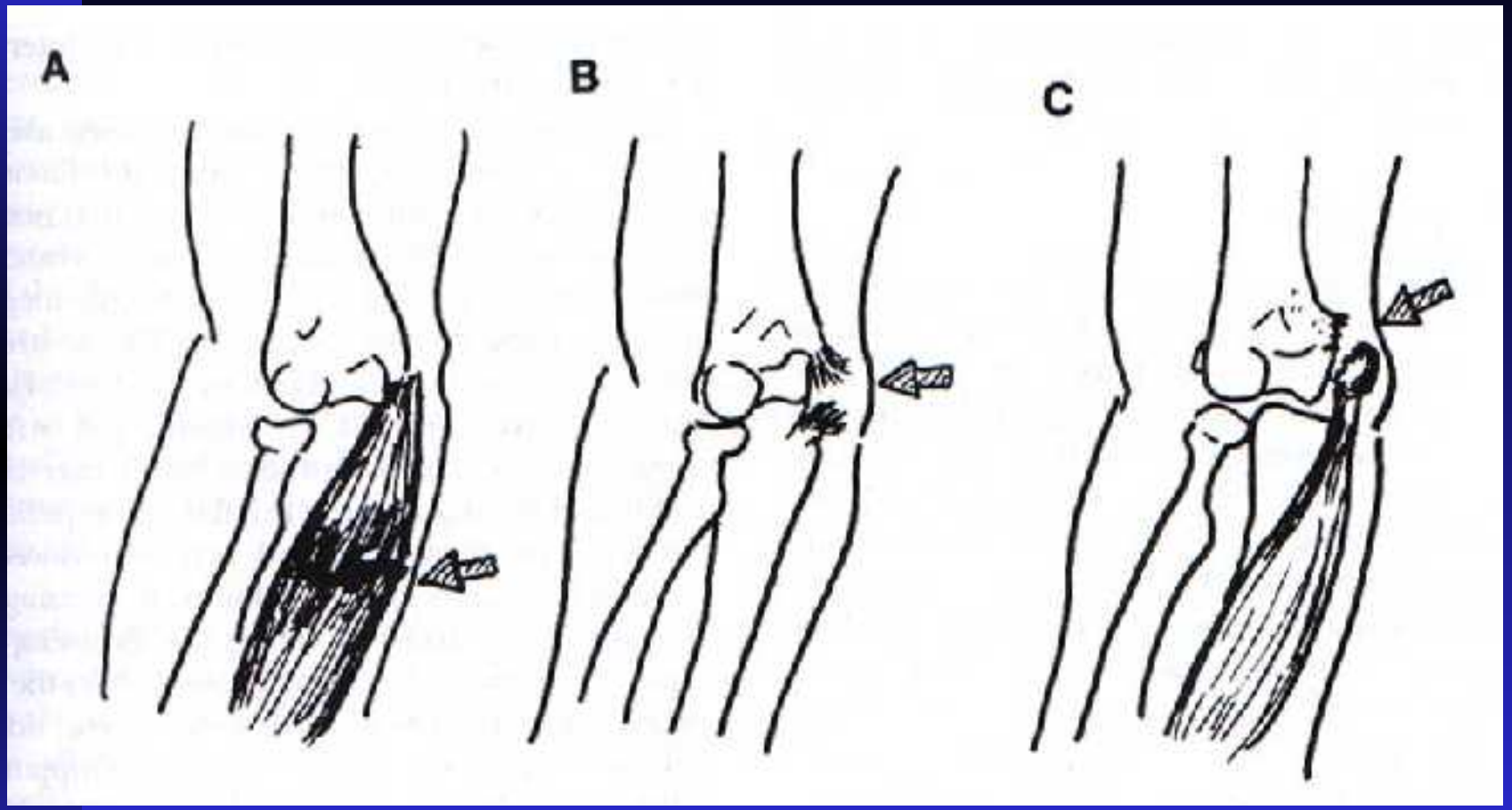
- Pathology
  - 30 - 50 years old
  - Repetitive micro trauma to common flexor tendon

Medial Epicondylitis (golfer's elbow)

- Mechanisms of injury
  - Throwing a baseball
  - Racquetball or tennis
  - Swimming backstroke
  - Hitting a golf ball

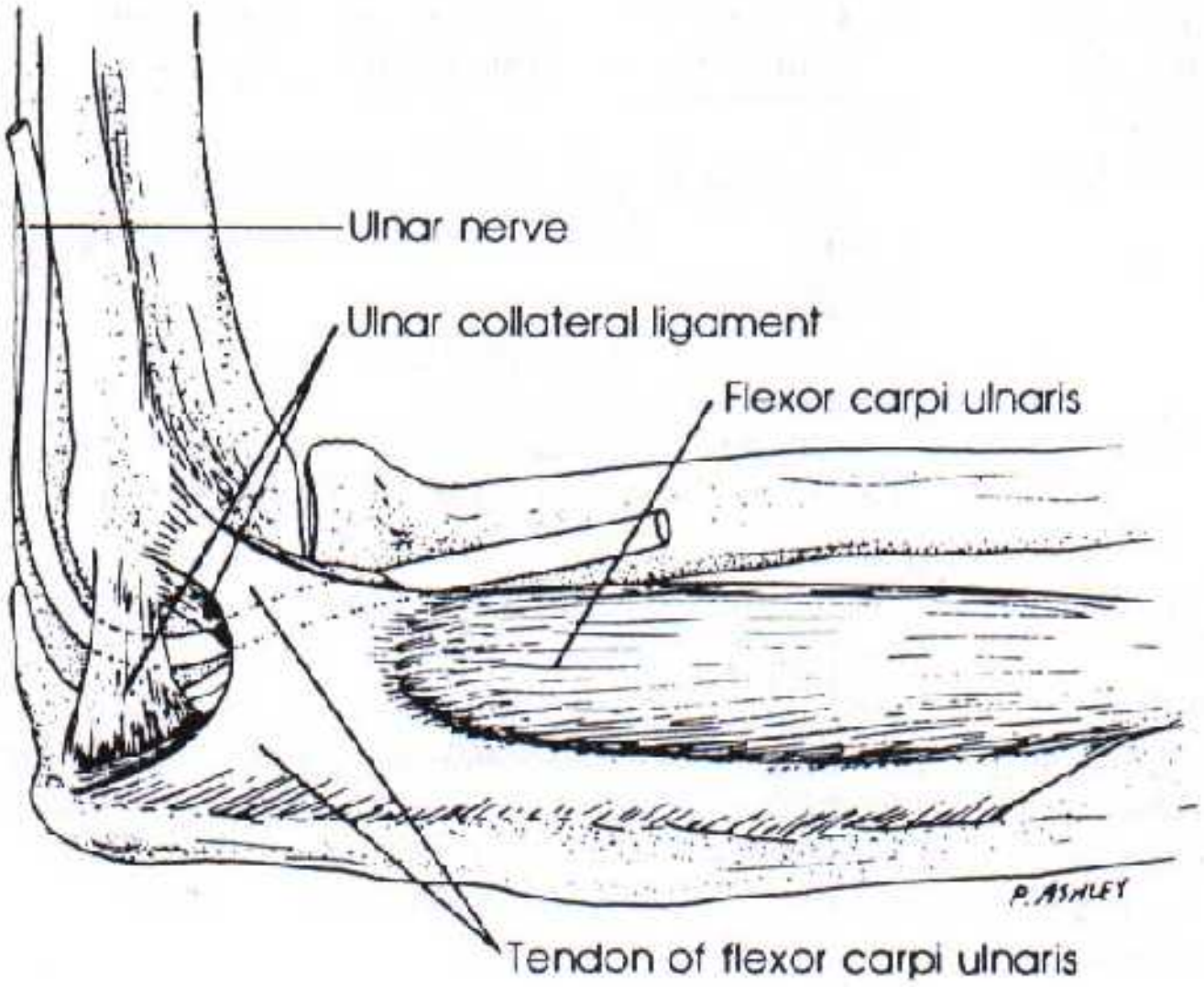
Medial Epicondylitis (golfer's elbow)

- Clinical signs and symptoms
  - Increased pain over medial epicondyle
  - Tenderness on palpation CFT
  - Tests
    - AROM; PROM
    - Resisted tests
    - Lidocaine


A
B
C

Ulnar Neuritis

- Pathology
  - Superficial position at the elbow
  - Excessive pressure in this area
  - Second most common entrapment neuropathy in the upper extremity


Ulnar nerve
Ulnar collateral ligament
Flexor carpi ulnaris
P. ASHLEY
Tendon of flexor carpi ulnaris

Ulnar Neuritis

- Mechanism of injury
  - Compression of the ulnar nerve: cubital tunnel (epicondyle, olecranon, MCL, arch of arcuate ligament and of 2 heads of FCU
  - Elbow flexion tightens arch
  - Repeated rapid activities such as throwing and prolonged flexion may traction or compress nerve
  - Nerve can sublux out of tunnel

Ulnar Neuritis

- Clinical signs and symptoms
  - Sensory changes in classic ulnar distribution: little finger and ulnar side of ring finger
  - Positive elbow flexion test
  - Positive Tinel's test
  - Weakness of grip
  - Deterioration of 2 point discrimination
  - Adductor Pollicus neuro-weakness
  - Neuro-weakness interossei (Wartenburg)

Ulnar Neuritis

- Common treatments
  - Non-operative: rest is imperative; NSAIDS; determination of cause and elimination of it
  - Surgical intervention: decompression or transposition

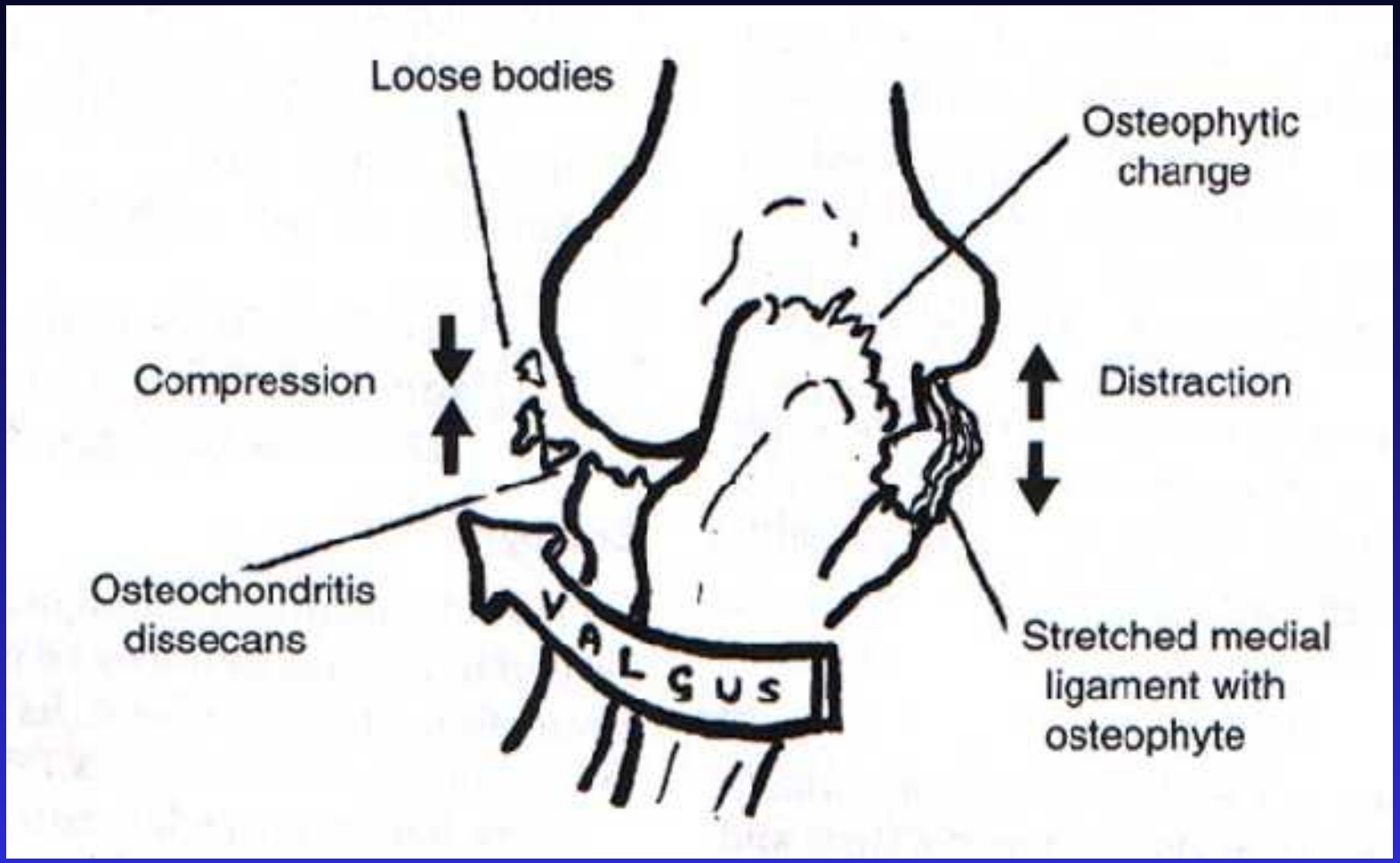
Medial Overload Syndrome in Throwers

- Pathology
  - Lateral joint line- compressive forces
  - Shear forces posteriorly in olecranon fossa
  - Tensile forces along medial joint line

TABLE 22-6. Throwing Injuries of the Elbow

- Medial tension overload
  - Muscular
    - Overuse
    - Fascial compression syndrome
  - Ligamentous and capsular
    - Ulnar traction spur
    - Loose bodies
    - Medial epicondylitis
    - Joint degeneration
- Lateral compression injuries
  - Osteochondritis dissecans
  - Capitellar fractures
  - Loose bodies
  - Lateral epicondylitis
  - Joint degeneration
- Extensor overload
  - Acute
    - Triceps strain
    - Olecranon fracture
  - Chronic
    - Bony hypertrophy
    - Stress fracture
    - Olecranon fossa loose bodies
    - Joint degeneration

(From Slocum,[62] with permission.)


Loose bodies
Osteophytic change
Compression
Distraction
Osteochondritis dissecans
VALGUS
Stretched medial ligament with osteophyte

Medial Overload Syndrome in Throwers

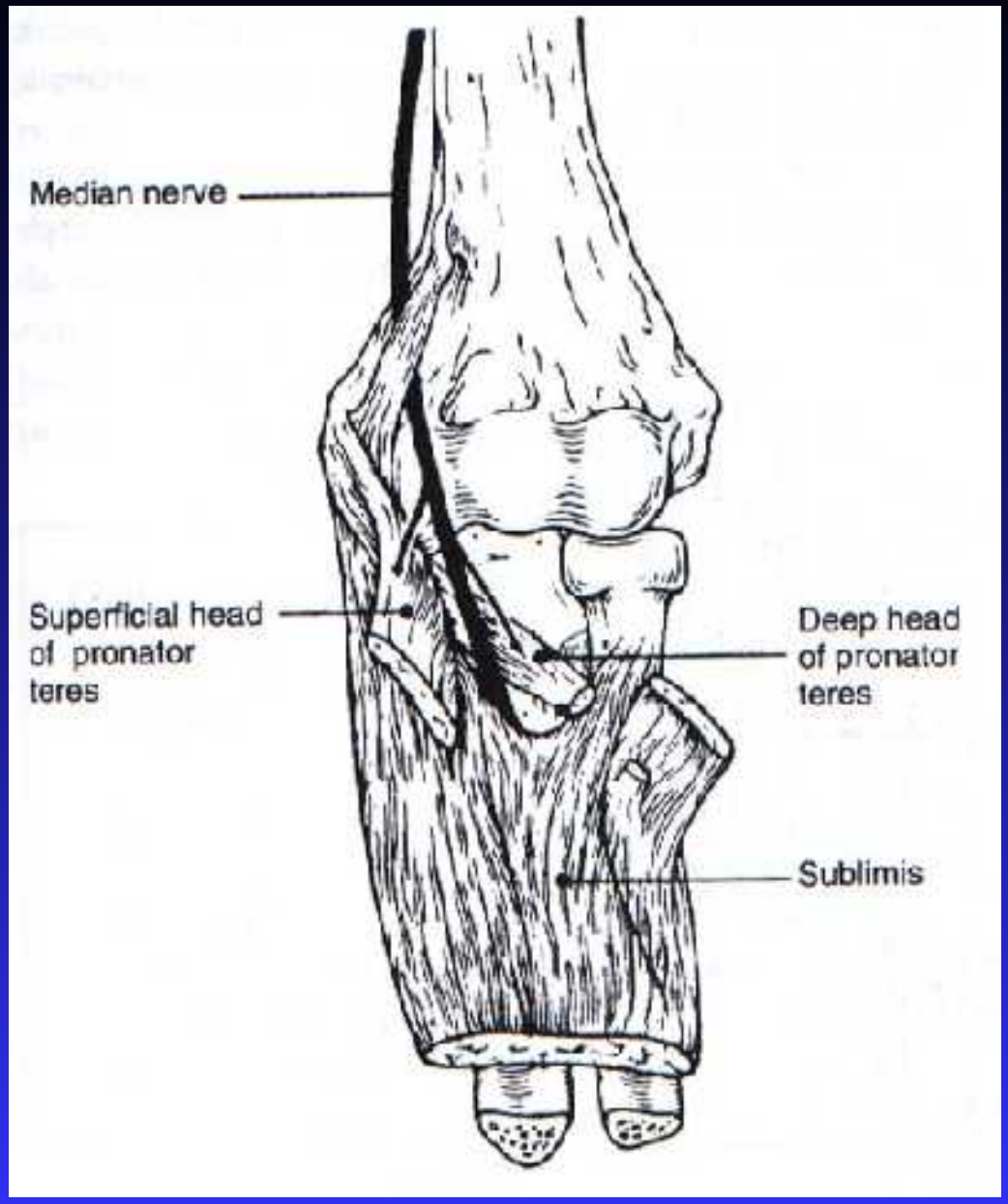
- Clinical signs and symptoms
  - Persistent medial elbow soreness
  - Arm fatigue is the 1st indicator of impending injury
  - Medial tenderness
  - Elbow pain

Medial Overload Syndrome in Throwers: Treatment

- Pre throwing stretches
- Adequate gentle warm up with gradual increase to higher velocity throws
- Post throwing stretching
- ICE after throwing
- Surgical Intervention

Anterior Interosseus Nerve Syndrome (Median Nerve)

- Pathology
  - Areas of possible compression
    - Between the head of the pronator teres
    - The proximal tendon of flexor digitorum superficialis

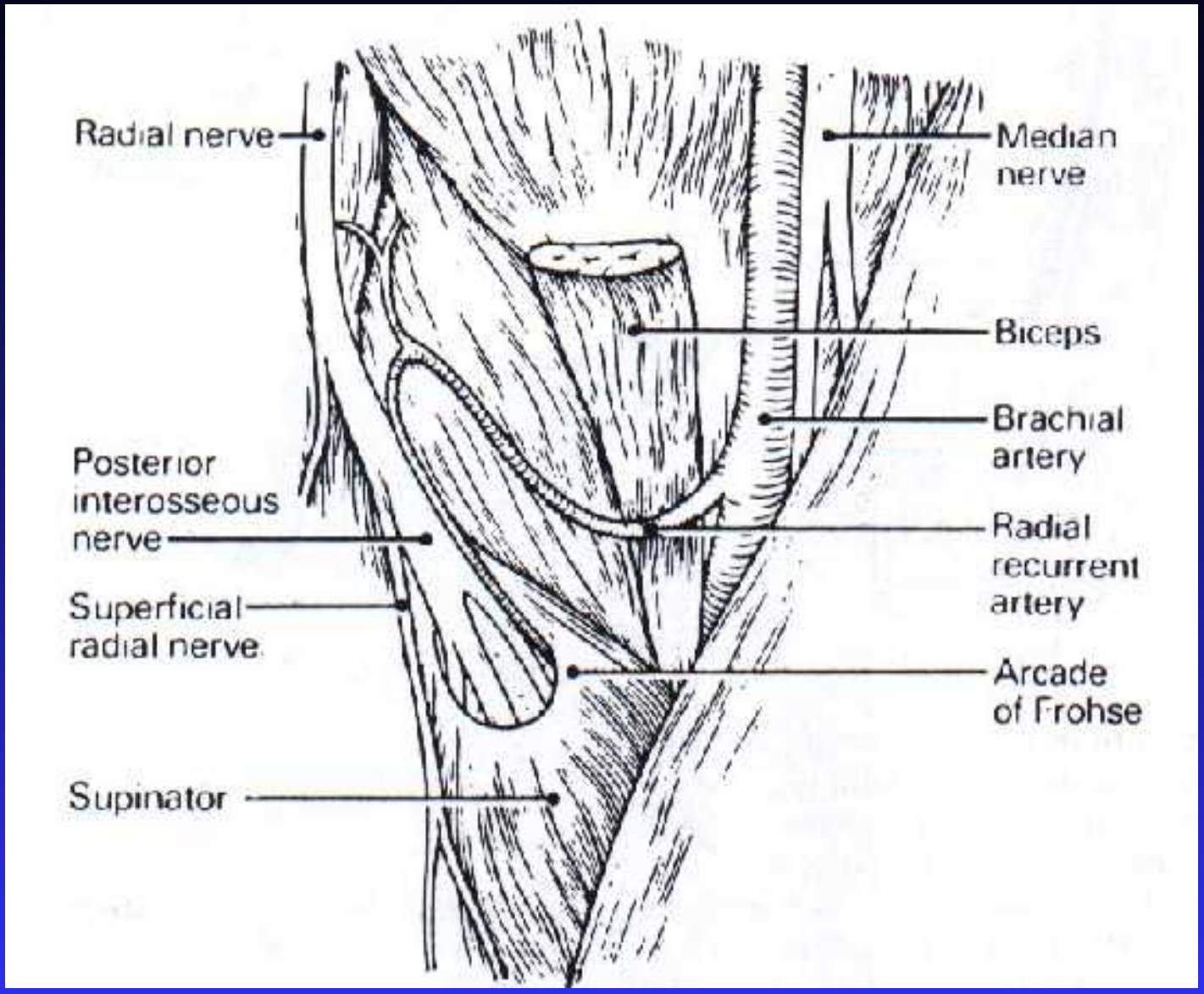

Median nerve
Superficial head of pronator teres
Deep head of pronator teres
Sublimis

Anterior Interosseus Nerve Syndrome

- Mechanism for Injury
  - Repetitive elbow flexion with forearm pronated
  - Tendinitis of deep head of pronator secondary to heavy lifting
  - Fractures or D/C of ulna or radius
- Clinical Signs and Symptoms
  - Pain
  - No sensory complaints or losses
  - Significant muscular weakness: loss of tip to tip pinch

Radial Tunnel syndrome/Posterior Interosseous Syndrom

- Pathology
  - Radial nerve compressed:
    - In the proximal radial tunnel anterior to the head of the radius where nerve supplies brachioradialis and ECRL, between the ulnar half of the ECRB and its fascia, and at the distal border of supinator.
    - Often mimics tennis elbow


Radial nerve
Median nerve
Biceps
Brachial artery
Posterior interosseous nerve
Radial recurrent artery
Superficial radial nerve
Arcade of Frohse
Supinator

Signs and Symptoms

- Classic S&S of lateral epicondylitis including pain on ROM and resistive testing; resisted supination > wrist ext.
- Maximum tenderness should be over the supinator muscle; 4 fingers breadth distal to the lateral epicondyle
- Pain can radiate up and down arm
- Weak grip
- Diagnostic local anesthetic block to CET

WRIST AND HAND

Carpal Tunnel Syndrome

- Median nerve compression within the carpal tunnel is the most common peripheral nerve entrapment syndrome.
- Any condition that decreases the cross sectional area of the carpal tunnel or increases the volume of its contents may cause the pathology. EX: lunate dislocation; distal radius fracture, sustained flexion or extension postures, fluid retention, synovitis

TABLE 23-5. Differential Diagnosis of Carpal Tunnel Syndrome

Site	Possible Diagnoses
Nervous system	
Spinal cord	Tumors, syringomyelia, amyotrophic lateral sclerosis
Spinal roots	Disc protrusion, spondyloarthrosis
Plexus	Cervical ribs, Pancoast's tumor, thoracic outlet syndrome
Peripheral nerves	Neuropathy, pronator teres syndrome, tumor (ganglion)
Locomotor system	
Muscles	Dystrophy, myalgia
Tendons	Tenosynovitis, spondylitis, bursitis, periarthropathy
Joints	Rheumatoid arthritis, osteoarthritis

Signs & Symptoms of CTS

- Pain, paraesthesia, or numbness in the median nerve distribution distal to the wrist
- Nocturnal paraesthesias common complaint
- Clumsiness and decreased prehension; tip to tip opposition of tips of thumb and little finger
- Sustained wrist flexion brings on symptoms

Practice Point

CLINICAL STAGES OF CARPAL TUNNEL SYNDROME

- Stage I
  -Uncharacteristic discomfort in hand
  -No precise localization to median nerve
- Stage II
  -Symptoms localized to territory supplied by the median nerve
- Stage III
  -Impairment of digital function
  -Usually complaints of clumsiness
- Stage IV
  -Sensory loss in median nerve distribution
  -Obvious wasting of thenar eminence

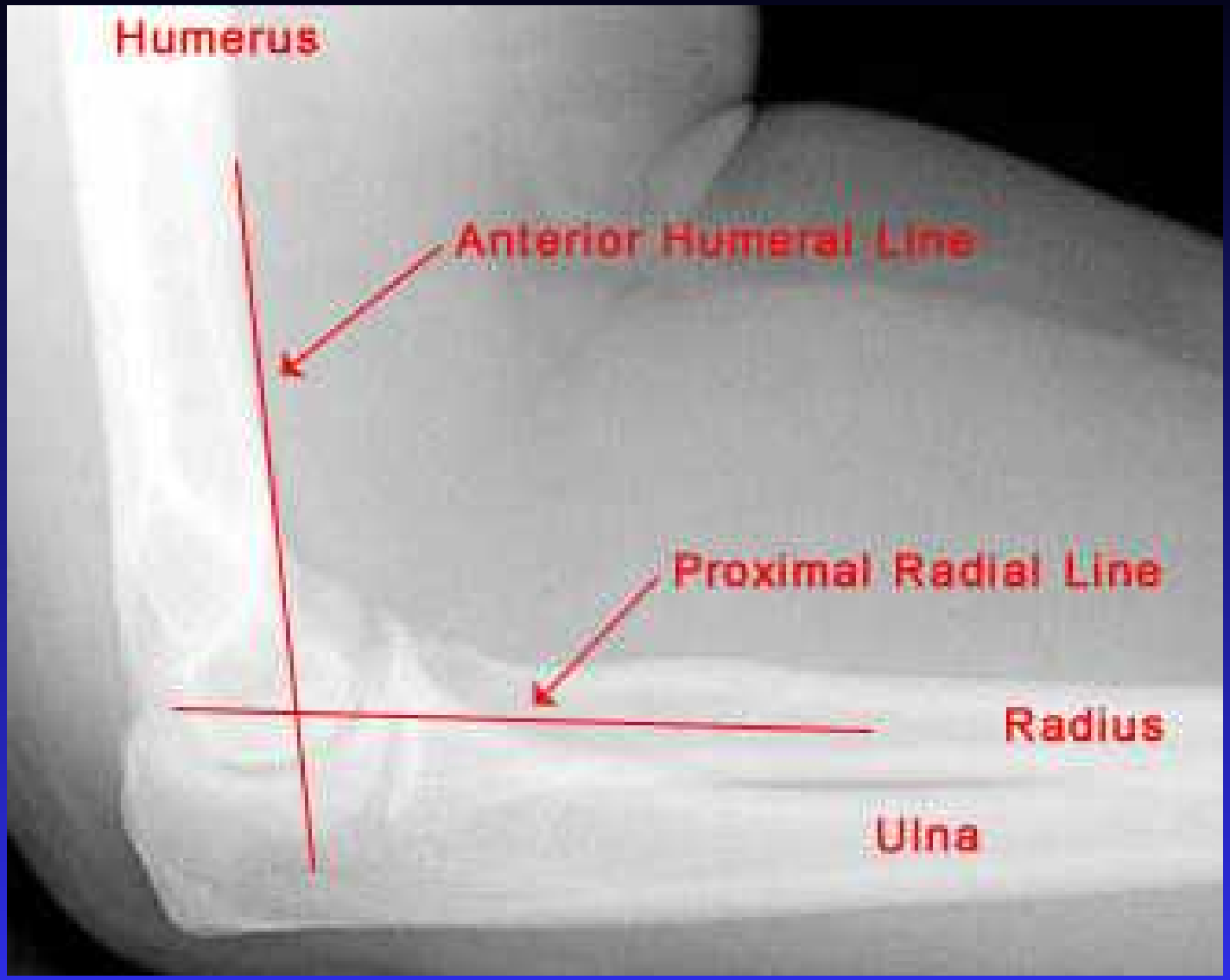
Treatment of CTS

- Eliminate risk factors such as take frequent rest breaks; ergonomic set up analysis and correction; decrease vibration and prolonged pressure, etc

- Neutral wrist splinting/rest/neural mobilization
- Check for double crush problem: elbow, shoulder, neck and treat corresponding areas
- NSAIDS
- Surgical release: failure of conservative tx or if significant thenar atrophy or sensory loss

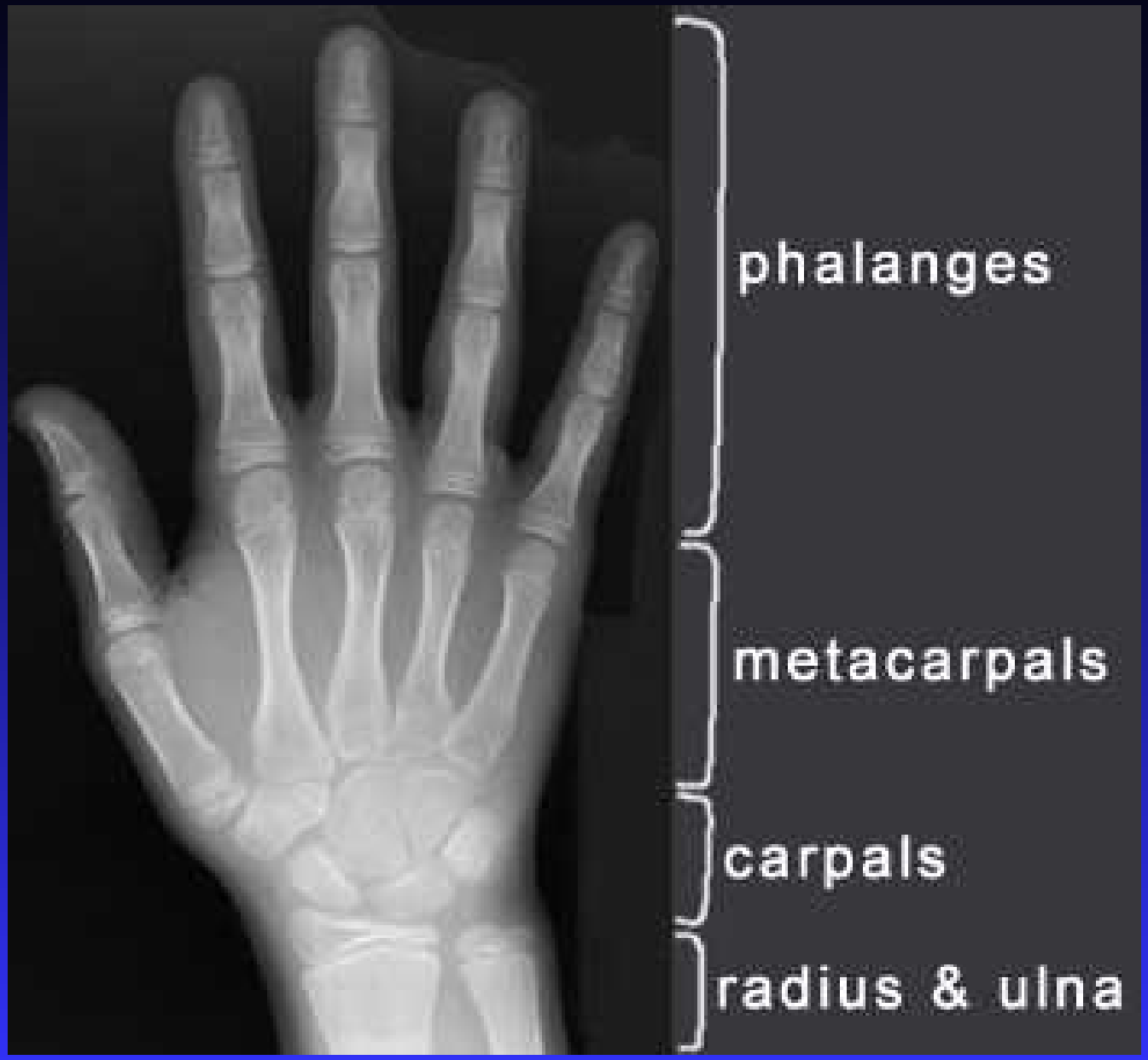
FINGER DEFORMITIES

- Swan Neck
- Boutonniere
- Claw fingers
- Trigger finger
- Ape hand
- Bishops hand
- Dupuytren Contracture
- Mallet finger
- Gamekeepers Thumb


Humerus
Anterior Humeral Line
Proximal Radial Line
Radius
Ulna


Ulna
Radius
Trochlea
(humerus)
Radius
Capitulum
& Trochlea
(humerus)
Tuberosity
(radius)
Olecranon
(ulnar)
Neck
Head
Humerus
Capitulum
(humerus)
Olecranon Fossa


Metacarpal
Hamulus of Hamate
Trapezium
Hamate
Trapezoid
Pisiform
Capitate
Triquetrum
Scaphoid
Lunate
Radius
Ulna


phalanges
metacarpals
carpals
radius & ulna