Lateral elbow pain

Disorder	Signs and Symptoms	Objective Assessment	Discussion
Lateral elbow tendinopathy	• Insidious onset • Activity related • Pain can radiate down forearm • Difficulty carrying objects • Pain with gripping • Pain with backhand in tennis	• Localised tenderness at origin of ECRB (distal and anterior to lateral epicondyle) • Reduced grip strength • Pain with resisted wrist extension in pronation (Cozen's test) • Pain with resisted middle finger extension (Maudley's test) • Pain with passive wrist flexion of fist with passive elbow extension (Mill's test)	<u>Incidence</u> • Prevalence of 1-2% (9% in tennis players) • Peak incidence in 5th decade • Increased prevalence in manual workers
Lateral collateral instability (radial collateral)	• Trauma involving varus force • Associated with fracture or subluxation at elbow joint.	• Varus stress test (elbow in 20-30^{o} flexion to unlock olecranon from the olecranon fossa, shoulder in full internal rotation to stabilise humerus) • Palpation of the LCL	• Isolated injuries to this ligament are extremely rare
Posterolateral rotatory instability	• Mechanism of injury: combination of axial compression, valgus stress, supination forces • Patient describes locking, snapping, clicking, catching and recurrent elbow dislocation	• Pivot shift test (examiner moves elbow into full supination with valgus and compressive stress, adding elbow extension causes posterior subluxation of the radial head, elbow flexion will cause sudden relocation of the radius and ulna onto the humerus)	• Usually needs stress testing under general anaesthesia under fluoroscopy
OA	• Insidious onset, progressive • Flare ups of pain with EMS • Pain can radiate down the forearm or up to the shoulder • Crepitus with elbow movement • More prevalent in manual workers especially who use power tools for prolonged periods • Associated loose bodies can cause locking	• Reduced elbow range of movement • Crepitus • X-ray	• Occurs secondary to trauma
Radial tunnel syndrome	• Vague, deep aching pain 3-4 cm distal to	• No motor or sensory dysfunction	• A compressive neuropathy

	epicondyle. Can extend from lateral elbow to wrist. • Aggravated by repetitive supination eg assembly workers	• Muscle weakness due to pain not muscle denervation • Pain at radial tunnel with resisted middle finger extension. • Pain at radial tunnel with resisted supination (with elbow and wrist in extension) • Pain at radial tunnel with passive pronation with wrist flexion (passive stretch of supinator increases pressure inside radial tunnel)	of the PIN • Radial tunnel syndrome coexists in 5% of patients with lateral epicondylitis (Tsai & Steinberg, 2008)
Posterior interosseous nerve entrapment	• Insidious onset with repetitive pronation / supination (eg athletes, violinists) • More common in manual labourers (associated with handling tools with the elbow in full extension) and bodybuilders • Can also occur acutely following a crush injury or blow to the proximal dorsal region of the forearm or with forearm fractures.	• No sensory deficit • Weakness of ECU, EDC, EIP, EDM, EPB, EPL, APL • Pain with passive pronation held for 30-60 secs • Pain with resisted supination • Can have tenderness over the lateral epicondyle and over the arcade of frohse	• Caused by entrapment of the PIN at the arcade of Frohse (formed by the superficial head of supinator) • ECRL, ECRB, Supinator spared as they are innervated by more proximal branches. Radial deviation will therefore occur with active wrist extension.
Cervical radiculopathy (C5/C6/C7)	• Neck pain aggravated by vertebral motion • Trapezial / interscapular pain • Dull ache –severe burning pain radiating down arm • sensory changes down the posterior aspect of the arm, posterolateral aspect of forearm, dorsum of hand, ring finger, and little finger • symptoms eased with offloading arm by placing arm behind their head	• Pain reproduced with cervical extension or cervical rotation or side flexion towards the symptomatic side. • Muscle weakness (myotome specific): C5: deltoid, biceps, C6: brachioradialis, wrist extension, C7: triceps, wrist flexion • Reduced sensation (dermatome specific) • Diminished reflexes: C5: biceps,C6: brachioradialis, C7: triceps • Spurling test (simultaneous extension, rotation to affected side, side flexion, and vertical compression reproduces symptoms in ipsilateral arm) • Reduction in symptoms with cervical spine traction	• Spondylosis leading to stenosis or bony spurs – more common in older patients. • Disc herniation – more common in younger patients
Tumours	• Red flags		

Medial elbow pain

Disorder	Signs and Symptoms	Objective Assessment	Points of note.
Medial elbow tendinopathy	• Insidious onset • Activity related • Aggravated by acceleration phase of throwing (baseball pitchers, javelin, tennis players) and golf	• Pain distal and anterior to the medial epicondyle over the insertion of the flexor-pronator muscles • Pain with resisted wrist flexion • Pain with resisted pronation (elbow 90◦ to isolate pronator teres) • Reduced grip strength	• Incidence: 0.4% population Peak incidence in 4th and 5th decades Affects women more than men
Ulnar nerve compression at cubital tunnel	• Paraesthesia ulnar 1½ digits • Worse at night time • Aggravated by leaning on elbow / sustained elbow flexion • Loss of hand dexterity • Grip weakness	• Intrinsic atrophy (guttering) • Claw hand deformity • +ve Tinel's sign • +ve elbow flexion test • Loss of sensation in ulna nerve distribution • Reduced 2 point discrimination in little finger • Muscle charting	• Ulna nerve can also sublux at cubital tunnel
Cervical radiculopathy (C8/T1)	• Neck pain aggravated by vertebral motion • Trapezial / interscapular pain • Dull ache – severe burning pain radiating down arm • sensory changes (dermatome specific) • symptoms eased with offloading arm by placing arm behind their head	• Pain reproduced with cervical extension or cervical rotation or side flexion towards the symptomatic side. • Muscle weakness (myotome specific) C8: thumb ext, thumb adduction, wrist ulnar deviation T1: intrinsic muscles of hand • Reduced sensation (dermatome specific) • Spurling's test (simultaneous extension, rotation to affected side, side flexion, and vertical compression reproduces symptoms in ipsilateral arm) • Reduction in symptoms with cervical spine traction	
MCL injury	• Trauma involving valgus force • Overload or stress from repetitive overhead throwing (tennis, volleyball	• Valgus stress test (elbow in 20-30^{o} flexion to unlock olecranon from the olecranon fossa, shoulder in full internal rotation to stabilise humerus)	
Elbow OA	• Insidious onset, progressive	• Reduced elbow range of movement	• Occurs secondary to

	• Flare ups of pain with early morning stiffness • Pain can radiate down the forearm or up to the shoulder • Crepitus with elbow movement • More prevalent in manual workers especially who use power tools for prolonged periods • Associated loose bodies can cause locking	• Crepitus with movement • X-ray	trauma
Osteochondritis dissecans	• Occurs most often in children and adolescents • Either history of injury or history of high impact activity	• Pain with elbow movement • Can get locking/ catching if loose piece of cartilage	• Rare • Avascular necrosis of subchondral bone
tumours	• Red flags		

Radial sided wrist pain

Disorder	Signs and Symptoms	Objective Assessment	
Scaphoid fracture / non-union	• Fall on an outstretched hand • Pain with movement / weight bearing	• Radial sided wrist oedema • Pain with all wrist movements • Tenderness in anatomical snuff box / scaphoid tubercle • X-ray	
Distal radius fracture	• Fall on an outstretched hand • Pain with movement / weight bearing	• Wrist deformity • Pain with all motion especially wrist flexion / extension • Tenderness on palpation of the distal radius • Radial sided wrist oedema • X-ray	
OA CMC	• Pain with pinch and highly dexterous activities. • Difficulty opening jars /bottles, turning keys / door knobs • Stiffness • Loss of function and strength	• +ve grind test • Shoulder sign • Webspace contracture • X-ray	• Associated with MCP joint hyperextension laxity which increases loading volar aspect of CMC joint • Can progress to involve the STT joints
Scapho-lunate ligament tear	• FOOSH injury • Clicking in the wrist with wrist movements	• Pain over scapho-lunate interval dorsally • +ve scaphoid shift test • Pain with clenched fist when moved from ulnar to radial position. • Thomas Terry sign on x-ray	
De-Quervains	• Pain along the 1st extensor compartment aggravated by tight grasps especially with wrist radial/ulnar deviation • Increased incidence in women postpartum and women in their 30s and 40s.	• Swelling and thickening of fibrous sheath • Tenderness over radial styloid • Pain with resisted thumb abduction and extension • +ve finkelstein test	• A stenosing tenosynovitis of APL and EPB tendons. • A high proportion of patients have a divided first dorsal compartment
FCR tenosynovitis	• Repetitive wrist flexion • Manual labour • Golf and racquet sports	• Tenderness and crepitus over tendon • Pain on resisted wrist flexion and radial deviation. • Pain with passive wrist extension	• Tendon enters a fibro-osseous tunnel just proximal to the trapezium. • Median nerve irritation can occur due to tenosynovitis of FCR due to close location
Wartenberg's syndrome	• Tight watch/ wrist band / hand cuffs, plaster	• +ve tinel's sign	

	• Tingling and numbness in distribution of SBRN • Ill-defined pain over dorsoradial hand • Aggravated by repetitive wrist flexion and ulnar deviation	• No motor dysfunction • Pain with wrist flexion, ulnar deviation and pronation for 1 minute • +ve finkelstein test •	
Cervical radiculopathy (C6)	• Neck pain aggravated by vertebral motion • Trapezial / interscapular pain • Dull ache –severe burning pain radiating down arm • sensory changes along dermatome • symptoms eased with offloading arm by placing arm behind their head	• Pain reproduced with cervical extension or cervical rotation or side flexion towards the symptomatic side. • Muscle weakness (myotome specific): C6: brachioradialis, wrist extension • Reduced sensation (dermatome specific) • Diminished reflexes: C6: brachioradialis • Spurling test (simultaneous extension, rotation to affected side, side flexion, and vertical compression reproduces symptoms in ipsilateral arm) • Reduction in symptoms with cervical spine traction	• Spondylosis leading to stenosis or bony spurs – more common in older patients. • Disc herniation – more common in younger patients
Volar ganglion cyst	• Bump felt on the wrist crease volarly below the thumb • Ache in the area • Bump can increase and decrease in size	• Evident near the distal wrist crease over the FCR tendon • Reduced wrist ROM	• Ganglion originates from the scaphotrapezial joint

Ulnar sided wrist pain

Disorder	Signs and Symptoms	Objective Assessment	
TFCC tear	• MOI: FOOSH injury or forceful forearm twisting whilst gripping • Snapping or clicking • Pain with activities that ulnarly deviate the wrist	• +ve ulnar impingement test (grind test) • pain on palpation just distal to the ulna styloid between ECU and FCU • pain / clunk with clenched fist in ulnar deviation with repeated pronation / supination	• associated with DRUJ instability • degenerate tear of the central portion of TFCC frequently a component of ulnar impaction syndrome
Lunotriquetral ligament tear	• hyperextension wrist injury (especially in radial deviation) • Pain with power gripping • Painful clunk with radial and ulnar deviation	• Pain on palpation of lunotriquetral interval (wrist in 30◦ flexion) • Lunotriquetral ballottement test (Regan's shuck test): +ve if laxity, crepitus, pain	
DRUJ instability	• Often caused by a twisting injury • Patient complains of clicking / clunking with forearm rotation	• Increased prominence of ulnar volarly or dorsally • +ve piano key test • +ve ulnocarpal impaction manoeuvre • Painful pronation / supination with a reduction in range.	
ECU subluxation	• Injury occurs with the forearm supinated with wrist fixed in flexion and ulnar deviation eg holding ball into chest in rugby, lead hand in golf, during backhands esp with top spin in tennis. • Patients often report a sudden and painful popping or tearing sensation • Painful snap over ulnodorsal wrist with forearm rotation	• Painful snap / visible subluxation with supination with wrist in flexion and ulnar deviation (ice cream scoop test) • Pain on palpation of ECU tendon over and just distal ulnar head • Pain / weakness with resisted wrist extension and ulnar deviation	• Occurs due to damage of the ECU subsheath
ECU tenosynovitis / tendinosis	• Repetitive activities where the wrist is flexed and extended particularly in a supinated position eg assembly workers • Change in activity • Gradual onset of ulnar sided wrist ache • Area of ache rather than specific point of pain.	• Subtle swelling dorso-ulnar side of wrist. • Pain with resisted wrist extension and ulnar deviation • Tenderness along course of tendon	
FCU tendinopathy	• Caused by repeated wrist flexion activities	• Pain with resisted wrist flexion and ulnar deviation • Tenderness along the course of the tendon	

Ulnar nerve compression at Guyon's canal	• Numbness and paraesthesia to 4th and 5th digits • Cramping weakness with pinch and grip • Often acute onset caused by fracture of the hamate or MC base. Can also be caused by repeated blunt trauma.	• +ve tinel's test over Guyon's canal • Weakness of interosseous muscles, abductor digiti minimi, adductor pollicis	• As the ulnar nerve exits Guyon's canal it divides into its motor and sensory branches. Compression within the tunnel therefore causes both motor and sensory symptoms.
Cervical radiculopathy (C8)	• Neck pain aggravated by vertebral motion • Trapezial / interscapular pain • Dull ache – severe burning pain radiating down arm • sensory changes (dermatome specific) • symptoms eased with offloading arm by placing arm behind their head	• Pain reproduced with cervical extension or cervical rotation or side flexion towards the symptomatic side. • Muscle weakness (myotome specific) C8: thumb ext, thumb adduction, wrist ulnar deviation • Reduced sensation (dermatome specific) • +ve Spurling's test • Reduction in symptoms with cervical spine traction	
OA pisotriquetral joint	• Insidious onset • Pain localised palmarly over pisiform	• Pain with passive wrist extension • Pain with resisted wrist flexion • Tenderness and crepitus with ballottement of the pisotriquetral joint • +ve grind test • X-ray	• Uncommon • Associated with FCU tendinopathy
Ulnar impaction syndrome (ulnocarpal abutment)	• Insidious onset • Increased pain with activities that require forceful grip with pronation and ulnar deviation eg opening door handle, pouring a drink. • Intermittent clicking sensation	• Pain on palpation dorsally just distal to the head of the ulna and ulnarly just volar to the ulna styloid • Increased pain with gripping especially in pronation • +ve ulna impingement (grind) test • X-ray (positive ulna variance, sclerotic changes, lunate cysts)	• Associated with positive ulnar variance -congenital or acquired (eg after distal radius fracture mal-union, radial head excision) • Degenerative condition caused by increased loading of the ulnocarpal joint
OA DRUJ	• Insidious onset, progressive • Flare ups of pain with early morning stiffness • Pain with functional tasks requiring pronation / supination	• Pain, crepitus with pronation / supination • Reduced ROM pronation / supination • Pain with compression of DRUJ (can combine this with pronation / supination)	• Occurs following intra-articular distal radius fracture