

팔꿈치 질환의 영상진단 (단순촬영, 초음파검사, 자기공명)

영남대학교 의과대학 영상의학과

조길호

뼈 및 관절의 단순 촬영

* Special techniques for the capitellum-radial head relationship

1. Radial head-capitellum view (Greenspan-Norman view; AJR 1982;138:1186)
2. Modified radial head-capitellum view (Br J Radiol 1998;71:74-75)

* Special position for imaging of the distal biceps tendon

1. Flexed elbow with abducted supinated shoulder on MR (AJR 2004;182:944)
2. Axial scan on the postero-medial aspect in the proximal forearm in the fully internal rotation state of the forearm on ultrasound (Australian Radiol 2005;49:404)

* 팔꿈치의 fat pad

숨은 골절 (occult fracture)을 진단하는데, posterior fat pad sign의 predictive value는 76% (J Bone Joint Surg (Am) 1999;81:1429-1433)

1. Anterior fat pad 는 정상에서도 보이나 관절 병변이 있을 때 그 모양이 sail sign으로 나타난다.
2. elbow extension lateral view 에서 fat pad 는 더 뚜렷하다 (Radiology 2002;222:419).
3. Occult fracture를 찾는데 초음파검사나 MR이 좋다.

뼈 및 관절의 MR판독에서 주의할 점

1. Vascular groove, Mach band, Fat strip 를 골절로 오인하면 안된다.
2. Pseudo-defects of the capitellum
3. Pseudo-defects of the trochlea: Cortical notch and Transverse ridge
4. Os supra-trochleare dorsale는 loose body, synovial chondromatosis와 감별이 필요.
5. 성장하는 뼈에서 ossification centers (mnemonic: CRITOE)를 주의한다.
6. Intra-articular synovial folds and lateral synovial fringe or fold (normal or locking elbow)

MR 과 초음파검사에서 연부조직 판독에서 주의할 점

1. Waviness of triceps tendon in elbow extension
2. Anterior and posterior fat pads

3. Aberrant ulnar vessels in the cubital tunnel
4. Asymptomatic subluxation of the ulnar nerve
5. Distal biceps tendon dives deeply and obliquely to the radial tuberosity
6. Intra-articular synovial folds and lateral synovial fringe or fold

팔꿈치 질환의 영상소견

Common Causes of Elbow Pain

1. Overuse syndrome: tennis elbow, golfer' s elbow
2. Bursitis: olecranon bursa, antecubital bursa
3. Nerve entrapment syndrome: radial tunnel syndrome, cubital tunnel syndrome
4. Trauma: biceps tendon, triceps tendon, muscle, bone
5. Tumorous conditions
6. Joint disease

DDx of lateral elbow pain: tennis elbow, entrapment of the radial nerve, degenerative changes of the radiocapitellar joint, posterolateral rotatory instability, and cervical spine problems.

DDx of medial elbow pain: medial epicondylitis, medial collateral ligament (MCL) injury, ulnar nerve injury, and degenerative changes of the medial elbow joint.

* Osteochondritis dissecans and Panner' s disease

1. Common in the anterior aspect of the capitellum due to repeated valgus stress and tenuous blood supply in early teens (older than 8 years).
2. Eventually resulting in OA in 50% of cases
3. Unstable bone fragment is encircled by fluid with separation from the maternal bone
4. DDx: Panner' s disease (common in 5-10 years old) or capitellar pseudo-defect
5. OCD는 capitellum의 anterior portion에, bony pseudo-defect는 capitellum의 posterior에 흔하다. OCD와 Panner' s disease의 감별에서 가장 중요한 것은 나이이다. OCD는 13-16세에 잘 생기고 loose body 형성과 residual deformity를 보인다. Panner' s disease는 capitellum의 osteochondrosis로 ossification이 완성되기 이전인 5-11세에 흔하고 fragmentation 소견을 보이나 residual deformity를 가지지 않는다.

* Arthritis

다른 관절의 소견과 같다. 감염이 의심되면 관절액 흡인이나 관절막 조직검사를 해야 한다.

- * Imaging findings of tendonitis: (1) tendon thickening (2) inhomogeneity of tendon fibers with loss of normal definition and (3) peri-tendinous fluid collection.

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* Tendon tear: (1) discontinuity of the tendon, and (2) hematoma formation, and adjacent soft tissue inflammation.

* Bursae around the elbow

1. posteriorly; olecranon bursa
2. anteriorly; bicipito-radial, and inter-osseous bursae
3. laterally and medially; epicondylar bursae respectively.

Muscle 은 편의상 4 groups로 분류	
Ant	(1)Elbow flexors (Biceps brachii & brachialis muscles) (2)Bicipital aponeurosis (=lacertus fibrosis)
Post	(1)Triceps brachii and (2) anconeus muscle
Med	(1)Pronator teres and (2)Superficial 4 flexors of the hand (FCR, PL, FCU, & FDS) FDS의 two head가 형성하는 fibrous arch 밑으로 ant inter-osseous nerve가 지남
Lat	(1)Superficial: Brachioradialis & ECRL (Ext. Carpi. Rad. Long.) (2)Common extensor group: ECRB (Brevis), ED (Ext Digitorum), EDM (minimi), ECU (3)Deepest: Supinator (post. inter-osseous nerve pierces in this muscle)

* Tumorous conditions around the elbow: 다른 부위의 소견과 같다. 팔꿈치에서는 림프절 종창이 가끔 있다.

* Nerve Entrapment: Nerve 주위에는 fat이 있어 axial T1-강조영상이 cubital tunnel의 해부와 ulnar nerve의 병변의 진단에 도움이 된다. Nerve의 크기는 주위의 vessel 보다 작다. MR 영상에서 nerve edema는 지방억제T2-강조영상이나 STIR영상에서 signal intensity의 증가를 볼 수 있다.

* Potential compression sites of the radial nerve

1. Tethering to joint via adhesive band proximally
2. Impingement of tendinous edge of ECRB in fully pronated arm
3. Branches of recurrent radial artery against radial neck
4. Arcade of Frohse (→ posterior inter-osseous nerve syndrome)

* Causes of cubital tunnel syndrome

1. cubitus valgus deformity, subluxation,
2. osteoarthritis, RA, synovial cyst,
3. flexion deformity of elbow, anomalous muscle, aneurysm, mass

Pronator syndrome:

the median nerve is compressed at the level of the elbow

Anterior Interosseous Nerve Syndrome:

Proximal forearm pain and motor weakness with no sensory deficit.

Inability to pinch together the tips of the thumb and index fingers (loss of the “OK” sign) owing to weakness of the FPL and FDP muscles.

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