

US Overextremitet

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Forskningsgruppe for Artroskopi og Idrettstraumatologi (FAIT)

Forskningsgruppe for Artroskopi og Idrettstraumatologi (FAIT) har, med hovedfokus på tilstander i kneet, som formål å bidra til lokal og nasjonal fagutvikling med pasienten i fokus. Haraldsplass Diakonale Sykehus har over tid vært blant de største norske sentra innen avansert knekirurgi, derunder fremre korsbåndsrekonstruksjon. Forskningsgruppen fungerer slik sett i et pasientnært miljø hvor avstanden fra kliniske problemstillinger til forskningsspørsmål er kort. Gruppen er bredt sammensatt og har et tværfaglig miljø med representasjon fra Ortopedi, Fysioterapi og Radiologi.

Resultater fra tidligere og pågående forskningsprosjekter har fått synlige implikasjoner i form av endring i kirurgiske teknikker, tiltak for å øke pasientsikkerhet/redusere antallet reoperasjoner og nye rutiner for radiologiske undersøkelser. Arbeider utgått fra gruppen har de siste år vunnet nasjonale utmerkelser og er ved flere anledninger



FAIT

2018

- ▶ Eirik Solheim, Janne Hegna, Torbjørn Strand, Thomas Harlem, Eivind Inderhaug (2018) **15-17 Years) Outcome After Microfracture Versus Mosaicplasty** in *journal of sports medicine* 46: 4. 826-831 Mar.
- ▶ Anagha P Parkar, Kristiane Bleskestad, Susanne Løken, Miraude E A P M Adriaensen, Eivind Inderhaug (2018) **anterior medial meniscus-An indirect sign of posterior cruciate ligament tear** in *radiology* 99: 146-153 Feb.
- ▶ Eirik Solheim, Janne Hegna, Eivind Inderhaug (2018) **Early determinants of outcome after articular cartilage repair surgery in the knee.** *Journal of orthopaedics* 15: 1- 22 Sep.
- ▶ Eivind Inderhaug, Maiken Kalsvik, Kristin H Kollevold, Jānne Hegna, Eirik Solheim (2018) **surgical treatment of subacromial pain syndrome with or without shoulder arthroscopy** in *Journal of shoulder and elbow surgery* 27: 750-760 Sep.
- ▶ Eirik Solheim, Janne Hegna, Eivind Inderhaug (2018) **Long-Term Survival of Autologous Chondrocyte Transplantation and Mosaicplasty for Articular Cartilage Repair: A Comparative Study Between Two Techniques** in *Journal of shoulder and elbow surgery* 27: 761-768 Sep.



2017

- ▶ Anagha P Parkar, Miraude E A P M Adriaensen, Søren Vindfeld, Eirik Solheim (2017) **Femoral and Tibial Insertions of the Anterior Cruciate Ligament: A Systematic Review of Anatomical Studies Reporting Normal Center Locations.** *The American journal of sports medicine* 45: 2017-2024 Jan.
- ▶ Eivind Inderhaug, Steinung Raknes, Thomas Østvold, Eirik Solheim, Torbjørn Strand (2017) **posterior tibial tunnel placement after using the 70-degree tibial plateau locator** in *Journal of shoulder and elbow surgery : official journal of the ESSKA* 25: 1. 152-158 Jan.
- ▶ Ingrid Husdal Dørum, Stig Heir, Eirik Solheim, Liv Heide Magnussen (2017) **Influence of shoulder position on the glenoid surface area available for bone grafting prior to arthroscopic subacromial decompression of the shoulder.** in *Journal of shoulder and elbow surgery* 26: 103-108 Jan.

Thomas Haugen
Tunnel placement
Video: official journal of the ESSKA
Eirik Solheim
Home at long term
ESSKA 25:

The original Lemaire

00:04:24

18th ESSKA Congress • 9 – 12 May 2018

ESSKA

2016

- ▶ Eirik Solheim, Janne Hegna, Eivind Inderhaug (2016) **Long-term clinical follow-up of mosaicplasty in articular cartilage defects of medial femoral condyle** in *Journal of orthopaedics* 13: 10-14 Jun.
- ▶ Eirik Solheim, Janne Hegna, Jannike Øyen, Eivind Inderhaug (2016) **Arthroscopic Tenotomy Versus Debridement.** *Arthroscopy : the journal of arthroscopic and related techniques* 32: 103-108 Jun.
- ▶ Gunnar Knutsen, Jon Olav Drogset, Lars Engebretsen, Torbjørn Grøntvedt, Torbjørn Strand, Oddmund Johansen (2016) **A Randomized Multicenter Comparison of Stem Cell Implantation with Microfracture: Long-Term Follow-up at 14 to 15 Years** in *Journal of shoulder and elbow surgery* 25: 16. 1332-1339 Aug.
- ▶ Eirik Solheim, Janne Hegna, Eivind Inderhaug (2016) **Long-term outcome of autologous chondrocyte transplantation in the knee** in *Journal of orthopaedics* 13: 15-19 Jun.

ORTOPEDISK UNDERSØKELSESTEKNIKK

Innhold i hefte

I Undersøkelse av overekstremitter

- **Skulder**
- **Albue**
- **Hånd/håndledd**

II Undersøkelse av underekstremitter

- **Hofke**
- **Kne**
- **Ankel/fot**

III Undersøkelse av rygg

Skulder Albue



Undersøkelse

- Inspeksjon
- Palpasjon
- Funksjon
 - ROM, kraft, stabilitet
- Spesielle tester



Hva skal vi se etter?



Symptomer & Funn

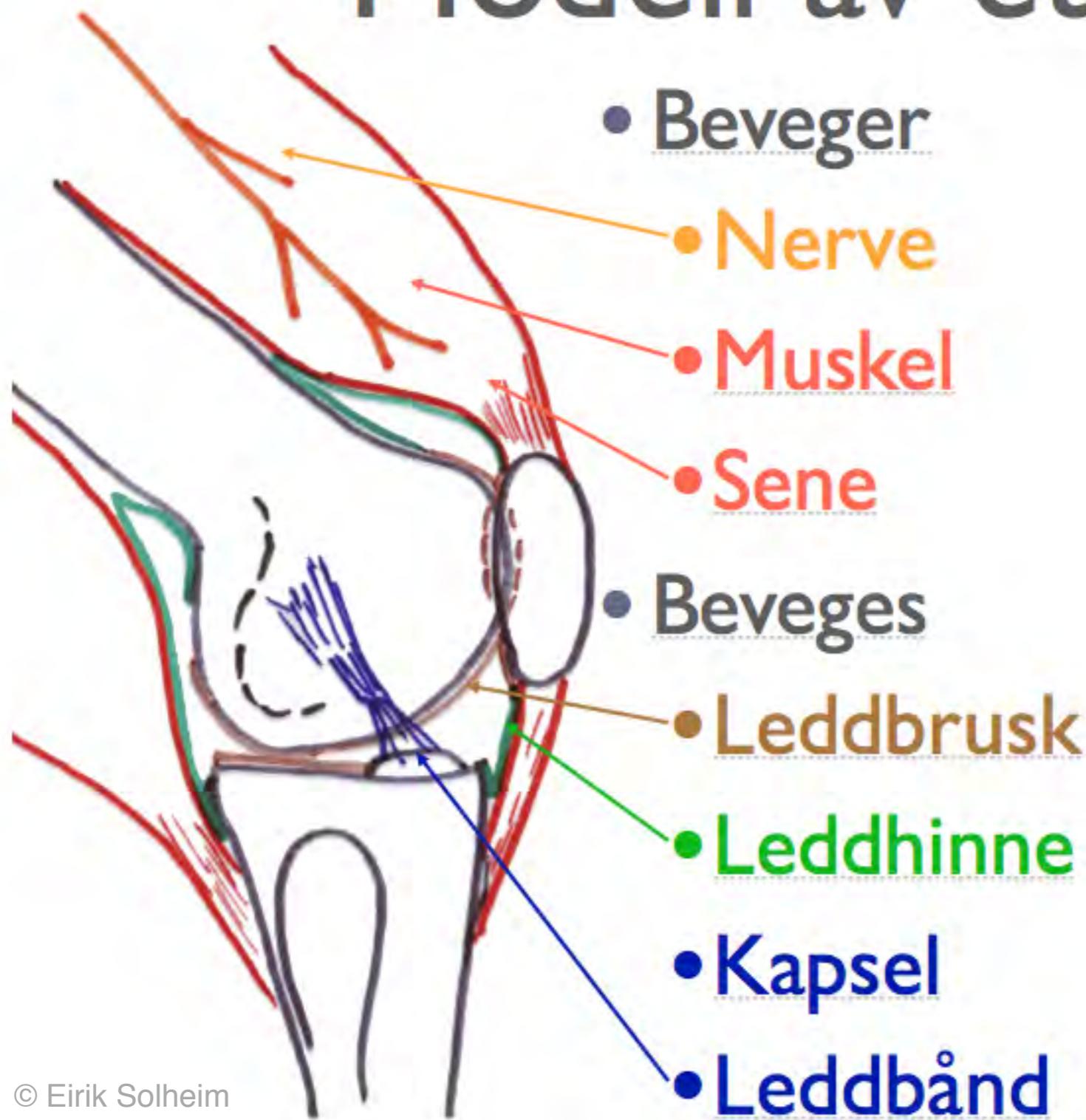
- Deformasjon
- Inflammasjonstegn
- Bevegelighet og Kraft
- Smerte-lokalisasjon og -provokasjon
- Økt bevegelighet - Instabilitet
- Mekanisk interposisjon

Modell av et ledd...



- Beveger
- Nerve
- Muskel
- Sene
- Beveges
- Leddbruk
- Leddhinne
- Kapsel
- Leddbånd

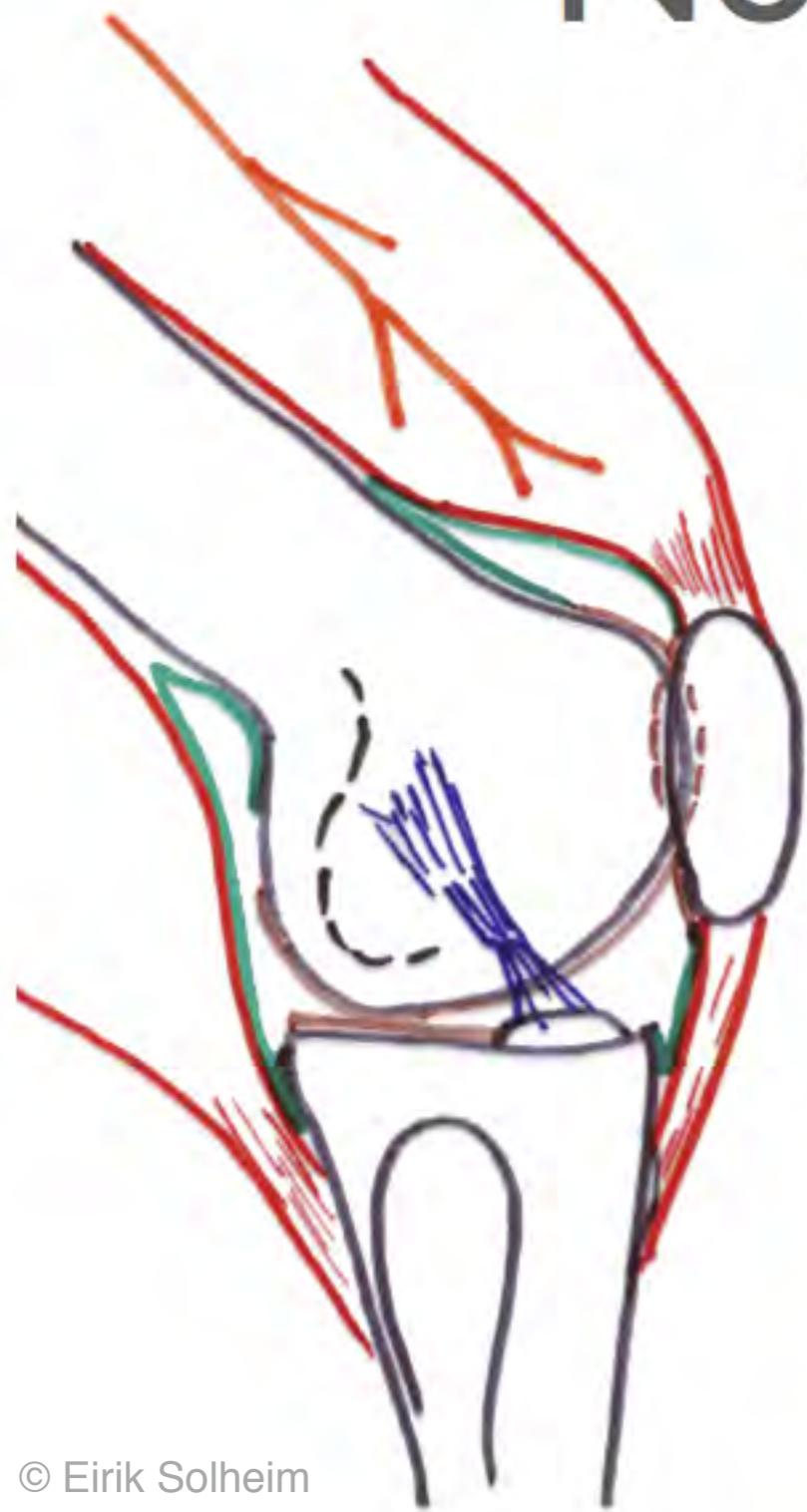
Modell av et ledd...



Extra-articulært

Intra-articulært

Normal funksjon



- Beveger
 - Nerve
 - Muskel
 - Sene
 - Beveges
 - Leddbrusk
 - Leddhinne
 - Kapsel
 - Leddbånd
- Normal kraft

• Smertefri bevegelse

• Normale utslag

• Stabilt ledd

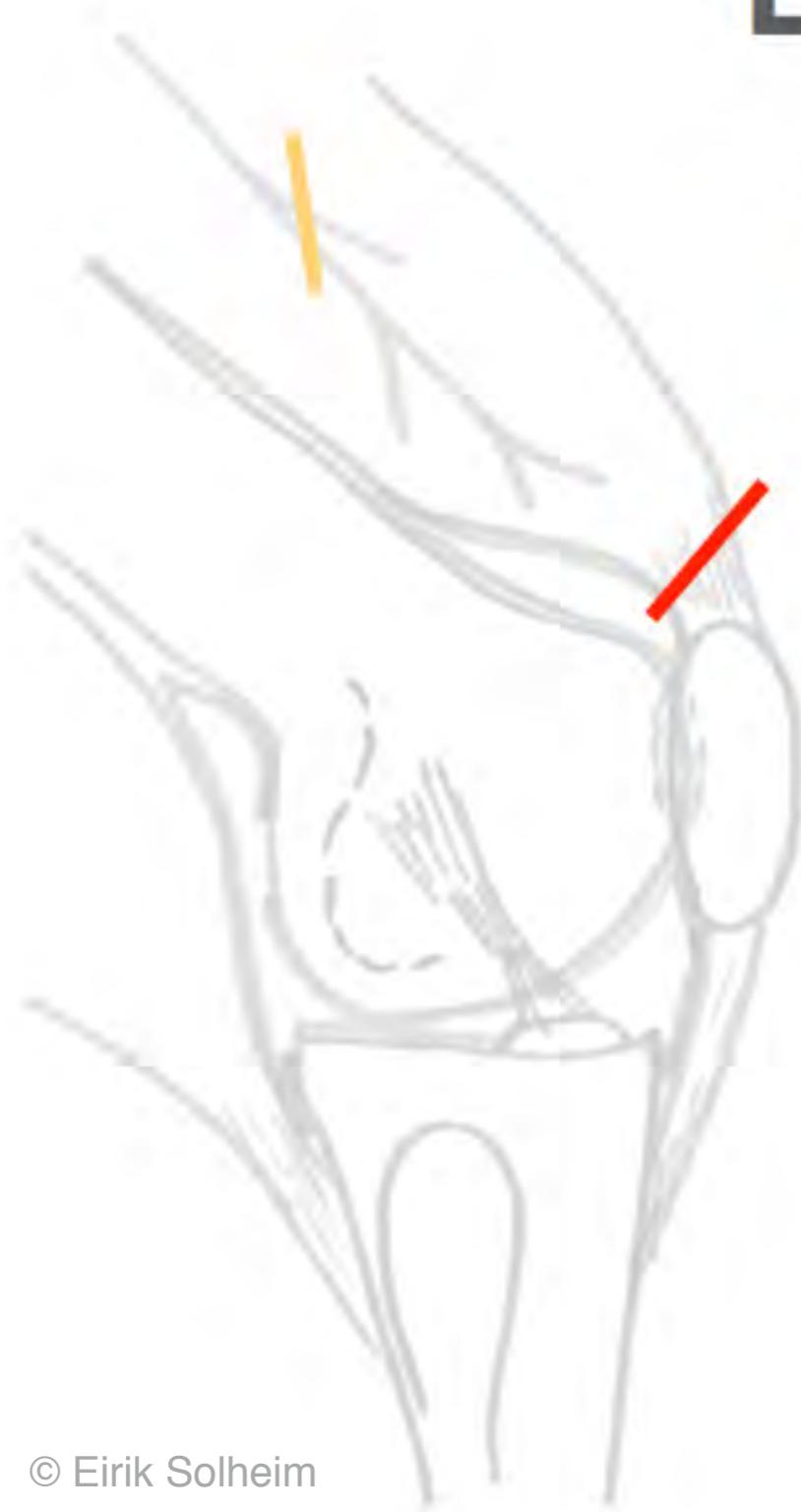
Dysfunksjon



- Beveger
- Nerve
- Muskel
- Sene
- Beveges
- Leddbrusk
- Leddhinne
- Kapsel
- Leddbånd

Dysfunksjon

- Beveger
 - Nerve
 - Muskel
 - Sene
- Beveges
 - Leddbrusk
 - Leddhinne
 - Kapsel
 - Leddbånd
- Nedsatt kraft



Dysfunksjon



- Beveger
 - Nerve
 - Muskel
 - Sene
- **Beveges**
- **Leddbrusk**
 - Leddhinne
 - Kapsel
 - Leddbånd
- {
 - Smarter
 - Opphaking
 - Smell, Knepp

Dysfunksjon



- Beveger:
 - Nerve
 - Muskel
 - Sene
- **Beveges**
 - Leddbrusk
 - **Leddhinne**
 - Kapsel
 - Leddbånd
- **Smarter**
- **Hevelse**
- **Varmeøkning**
- **Rubor**

Dysfunksjon



- Beveger:
 - Nerve
 - Muskel
 - Sene
 - Beveges
 - Leddbrusk
 - Leddhinne
 - Kapsel
 - Leddbånd
- } {

 - Svikt
 - Glipp
 - Instabilitet

Anamnese

- Skademekanisme/utløsende faktor
 - Traume - Atraumatisk
 - Akutt - Kronisk
- Symptomer
- Hva bedrer/forverrer
- Funksjonsnivå
- Tidligere undersøkelse
- Tidligere behandling

Undersøkelse

- Inspeksjon
- Palpasjon
- Funksjon
 - ROM, kraft, stabilitet
- Spesielle tester



Inspeksjon

- Beinkonturer
 - Akser, Feilstilling, Deformasjon
- Bløtvevskonturer
 - Hevelse, Atrofi, Hypertrofi
- Hud
 - Rubor, Utslett, Arr (skade/kirurgi)

Palpasjon

- Hudtemperatur (inflam., sirk.)
- Ømhet (en finger) relatert til anatomi
- Hevelse/tumor
 - Størrelse, Overflate, Fasthet, Avgrensning
- Søkk
- "Distal status" (fraktur/luksasjon)
 - Arteriepuls, Sensibilitet

Funksjon

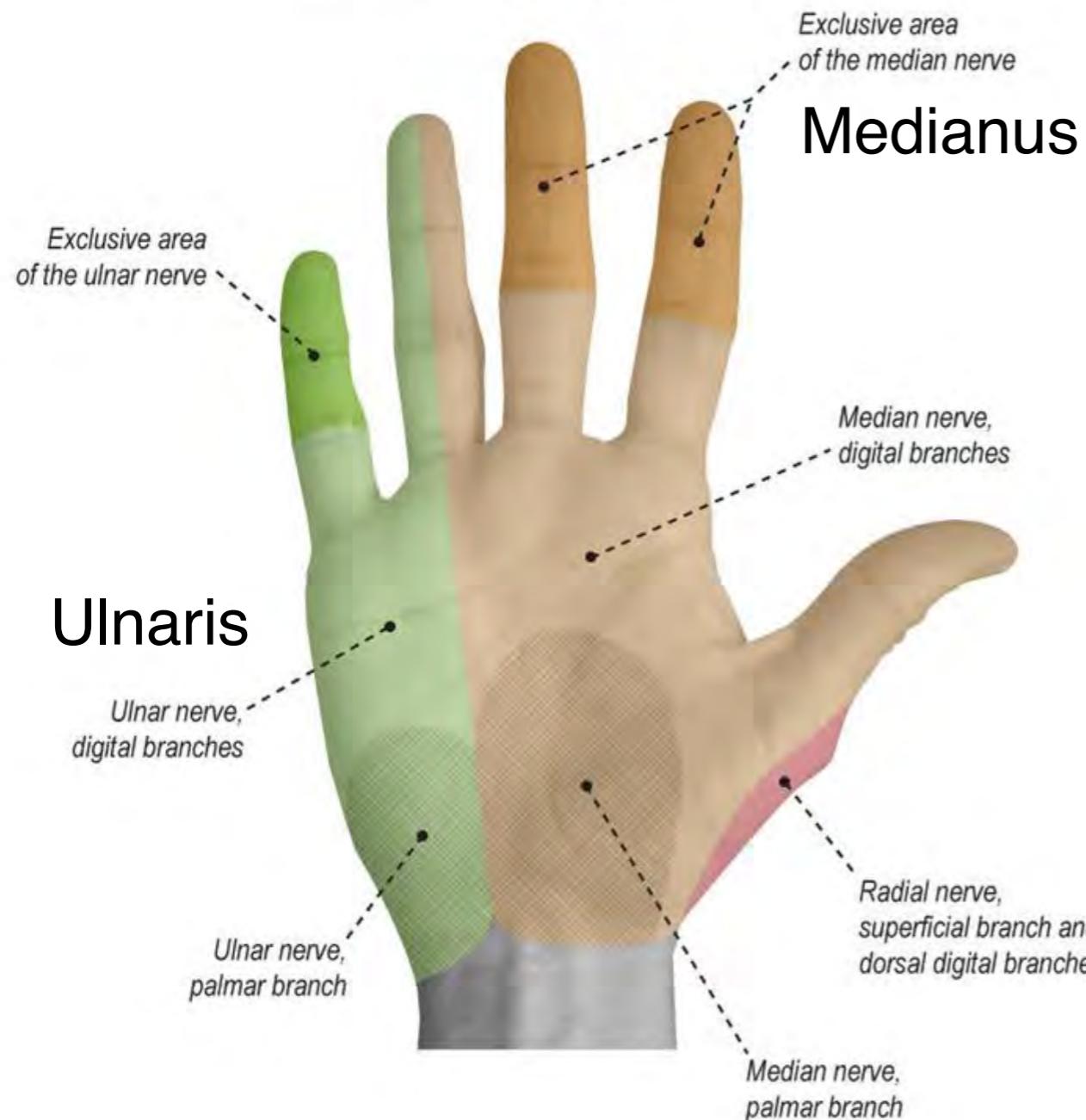
- Bevegelsesutslag
 - Passivt, Aktivt
 - Smerteprovokasjon, Avvergreaksjon
 - Mekanisk hemming, Krepitasjon, Knepp
- Muskelkraft, Sensibilitet, Reflekser
- Stabilitet

Utredning

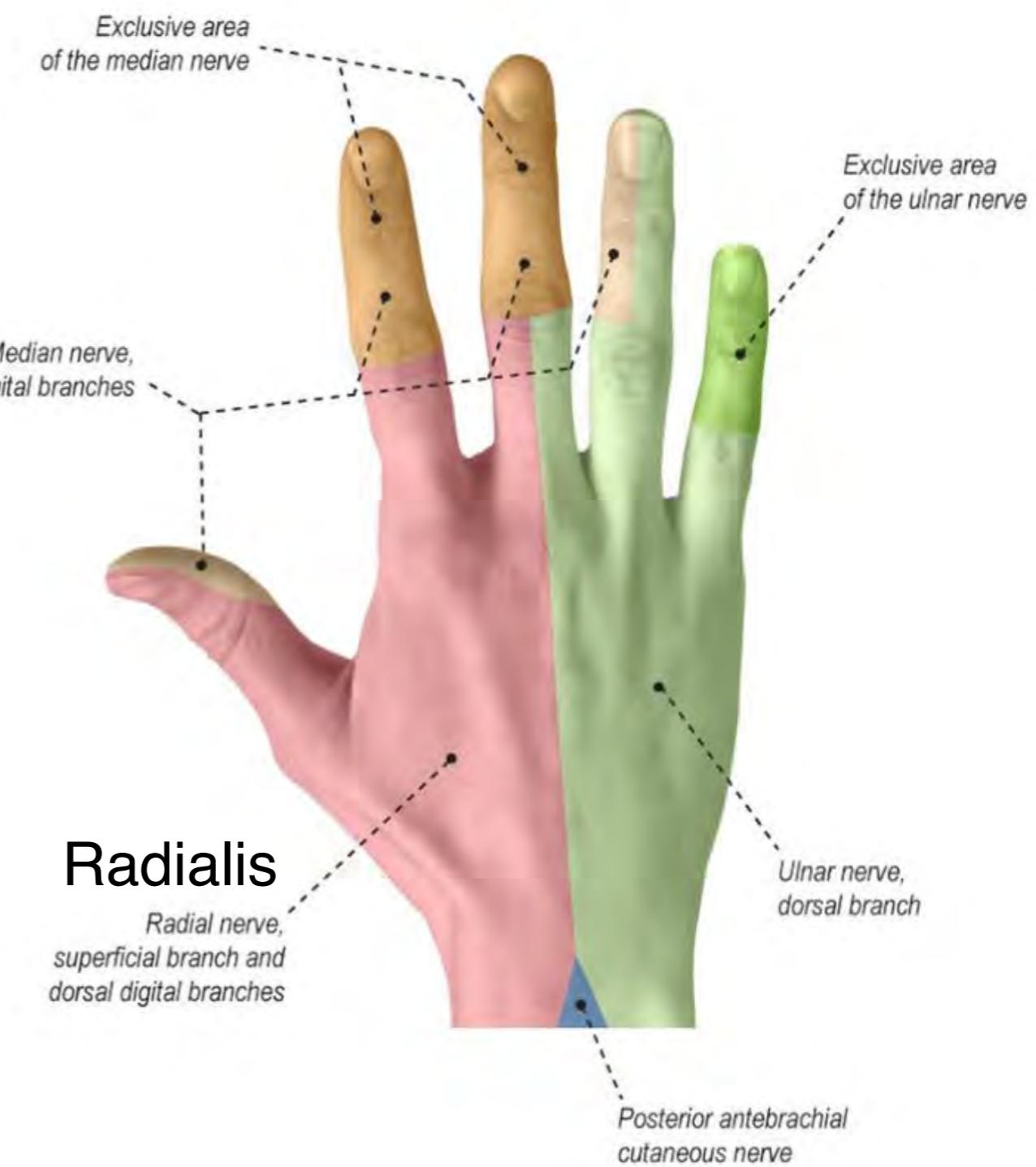
- Anamnese
- Klinisk undersøkelse
 - Inspeksjon, Palpasjon, Funksjon, Spesielle tester
- Supplerende undersøkelser
- Stille diagnose og foreslå behandling
- Evaluere resultatet

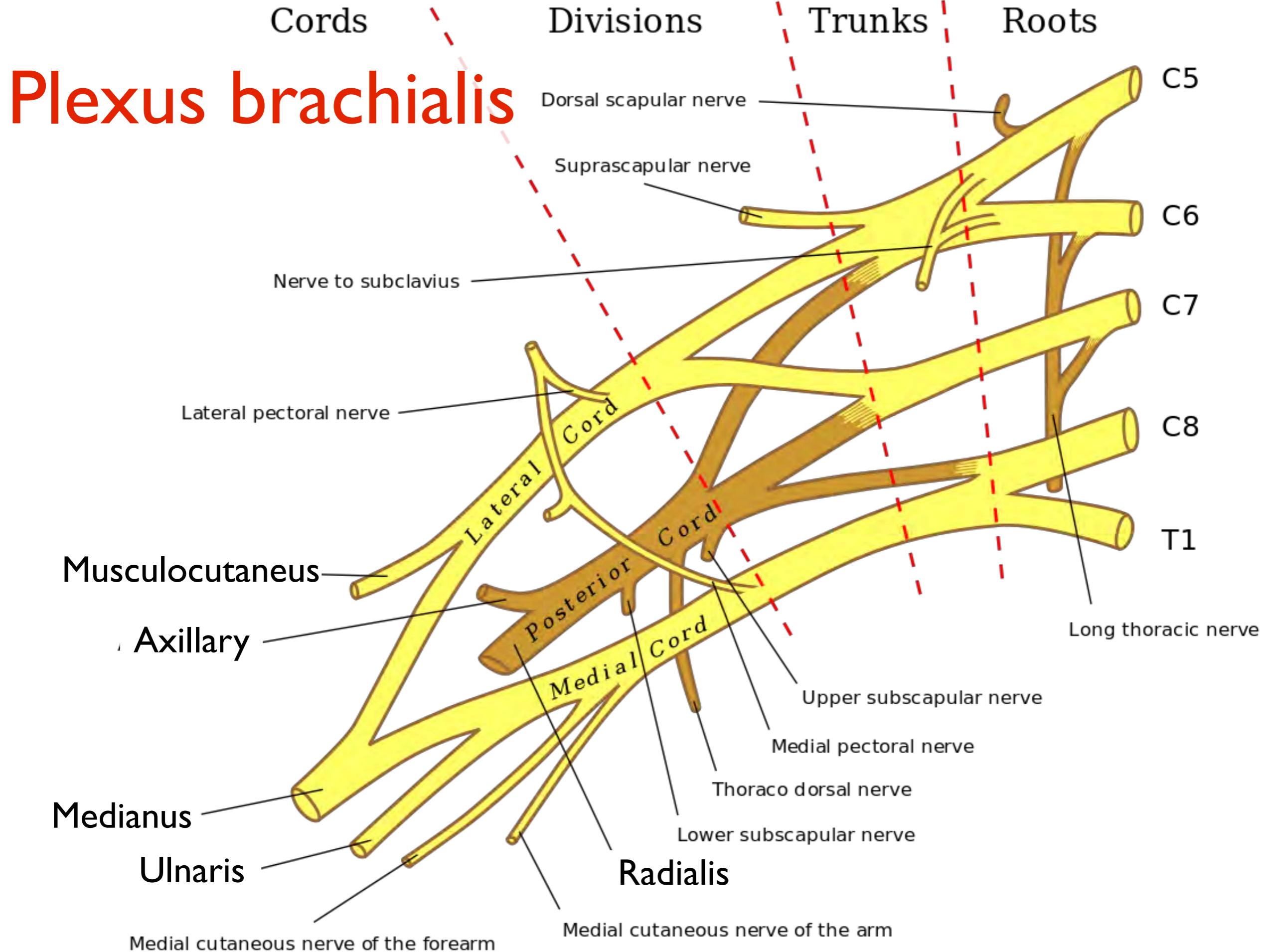
Nerver

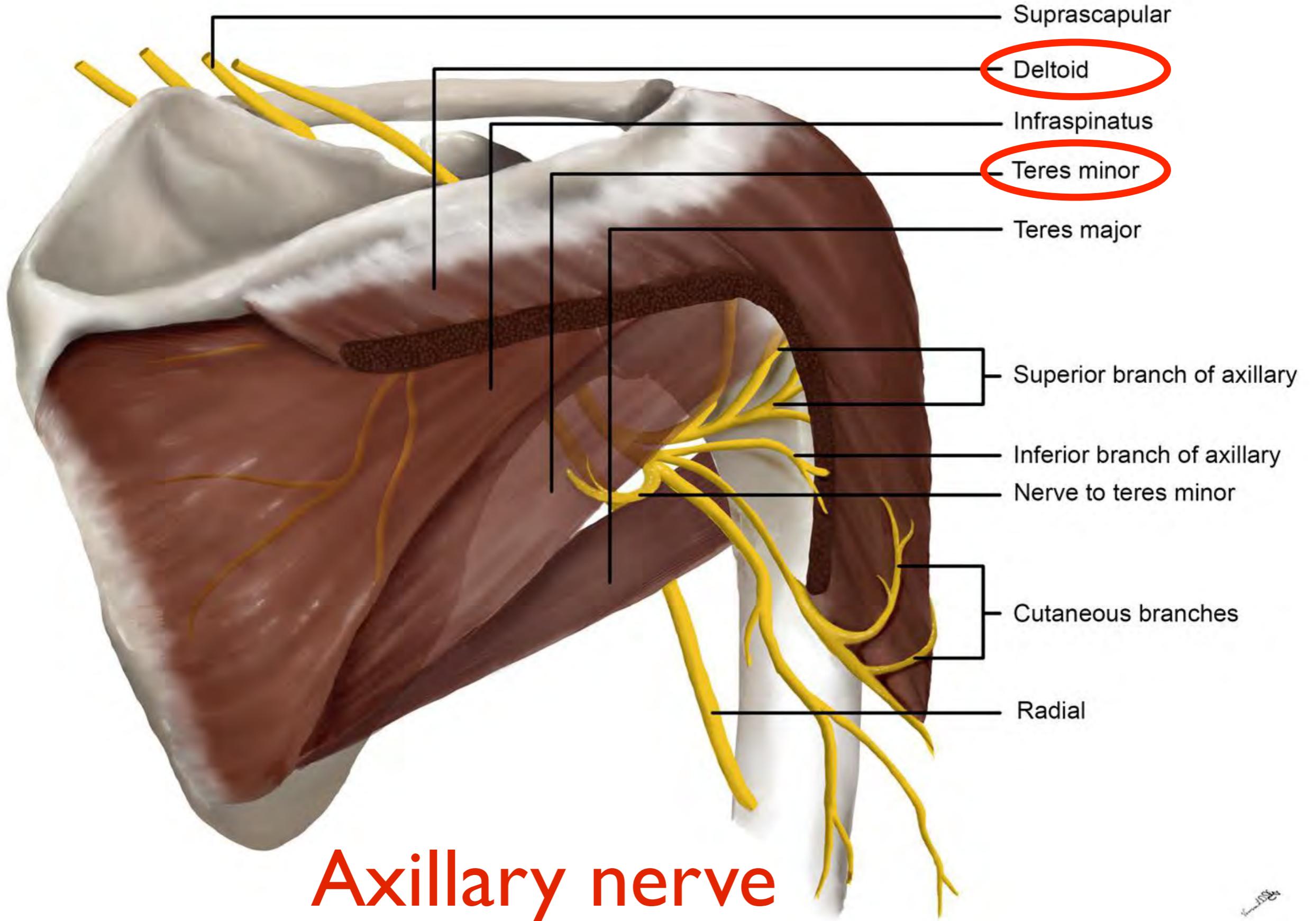
Sensory Territories and Innervations
(Volar View)



Sensory Territories and Innervations
(Dorsal View)

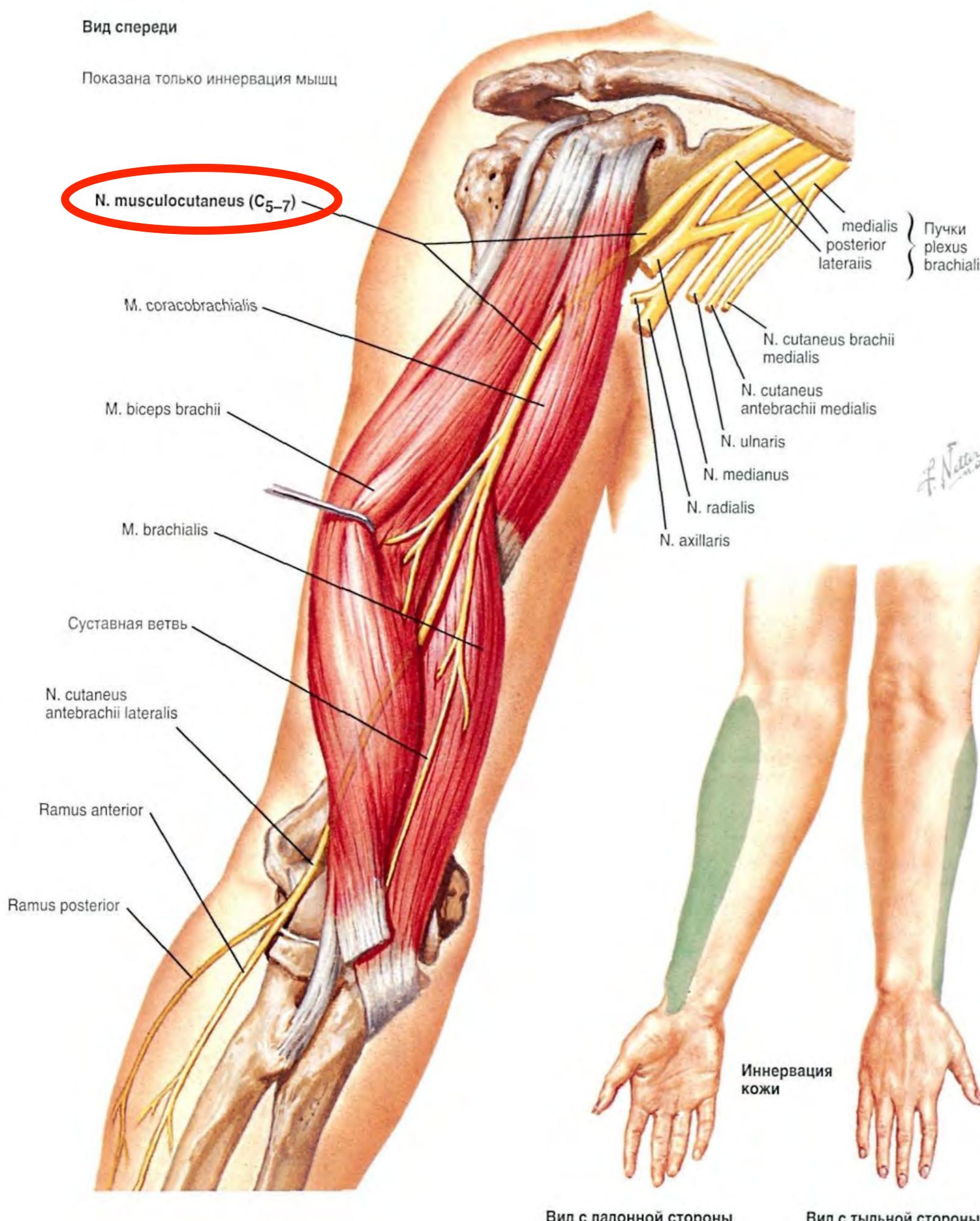






Вид спереди

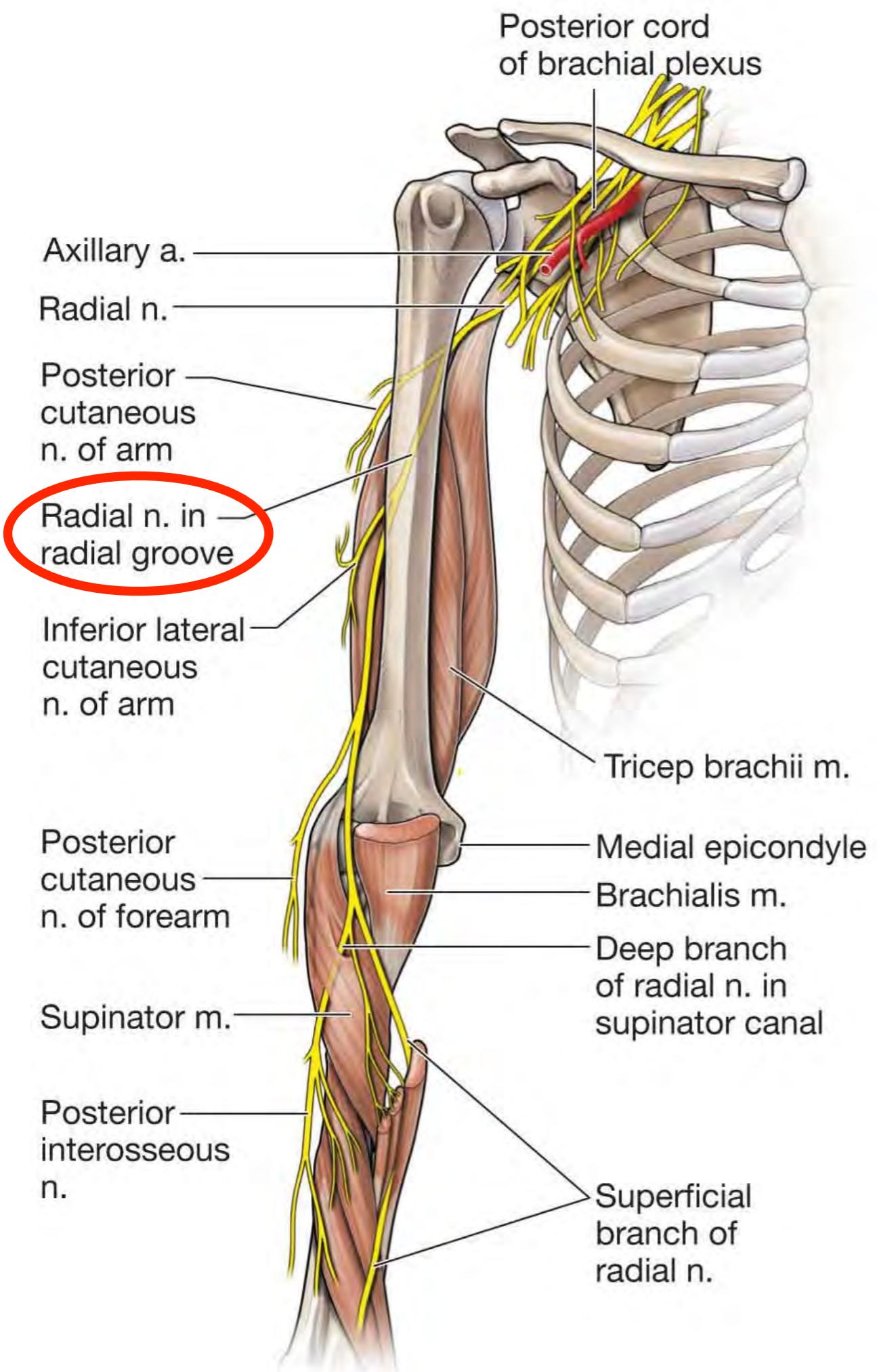
Показана только иннервация мышц



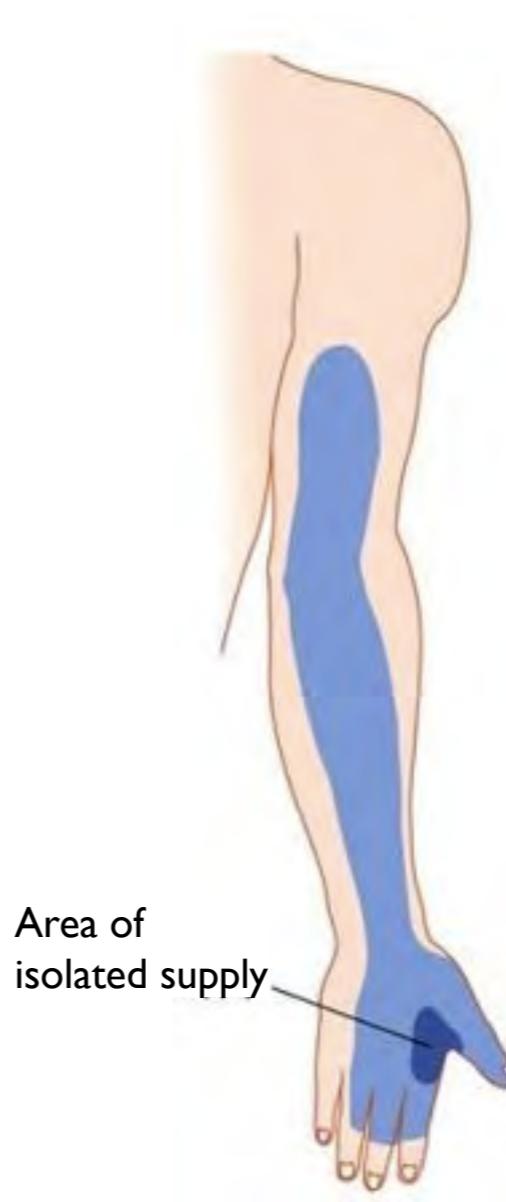
Musculo-cutaneus nerve

Вид с ладонной стороны

Вид с тыльной стороны



Radial nerve



Anterior view

Note: only muscles innervated by median nerve shown

Musculocutaneous nerve

A Median nerve (C₈, 6, 7, 8, T₁)

Inconstant contribution

Pronator teres muscle (humeral head)

Articular branch

Flexor carpi radialis muscle

Palmaris longus muscle

Pronator teres muscle (ulnar head)

Flexor digitorum superficialis muscle
(turned up)

Flexor digitorum profundus muscle
(lateral part supplied by anterior interosseous nerve; medial part supplied by ulnar nerve)

Anterior interosseous nerve

Flexor pollicis longus muscle

Pronator quadratus muscle

D Palmar branch of median nerve

Thenar muscles

B Abductor pollicis brevis
Opponens pollicis
Flexor pollicis brevis
(superficial head;
deep head often supplied by ulnar nerve)

1st and 2nd
lumbrical muscles

Anastomotic branch
to ulnar nerve

Common palmar
digital nerves

Proper palmar
digital nerves

Dorsal branches to
dorsum of middle and distal phalanges



Median nerve



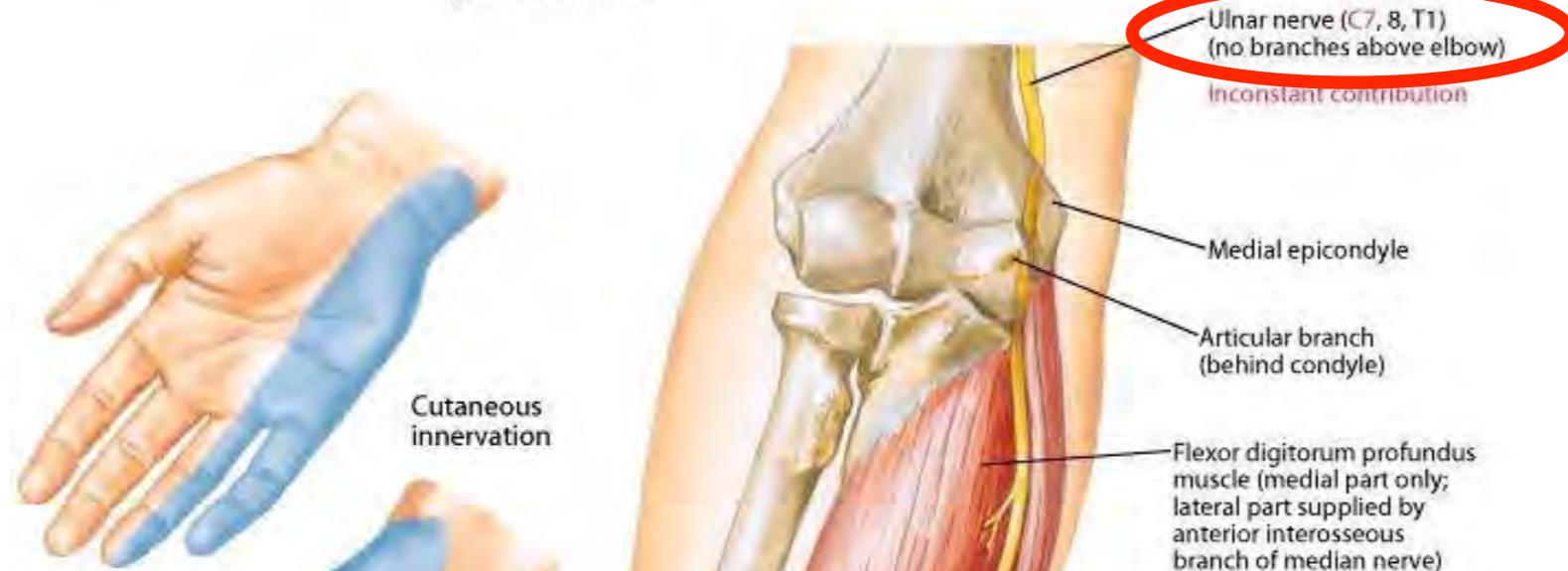
C Cutaneous innervation



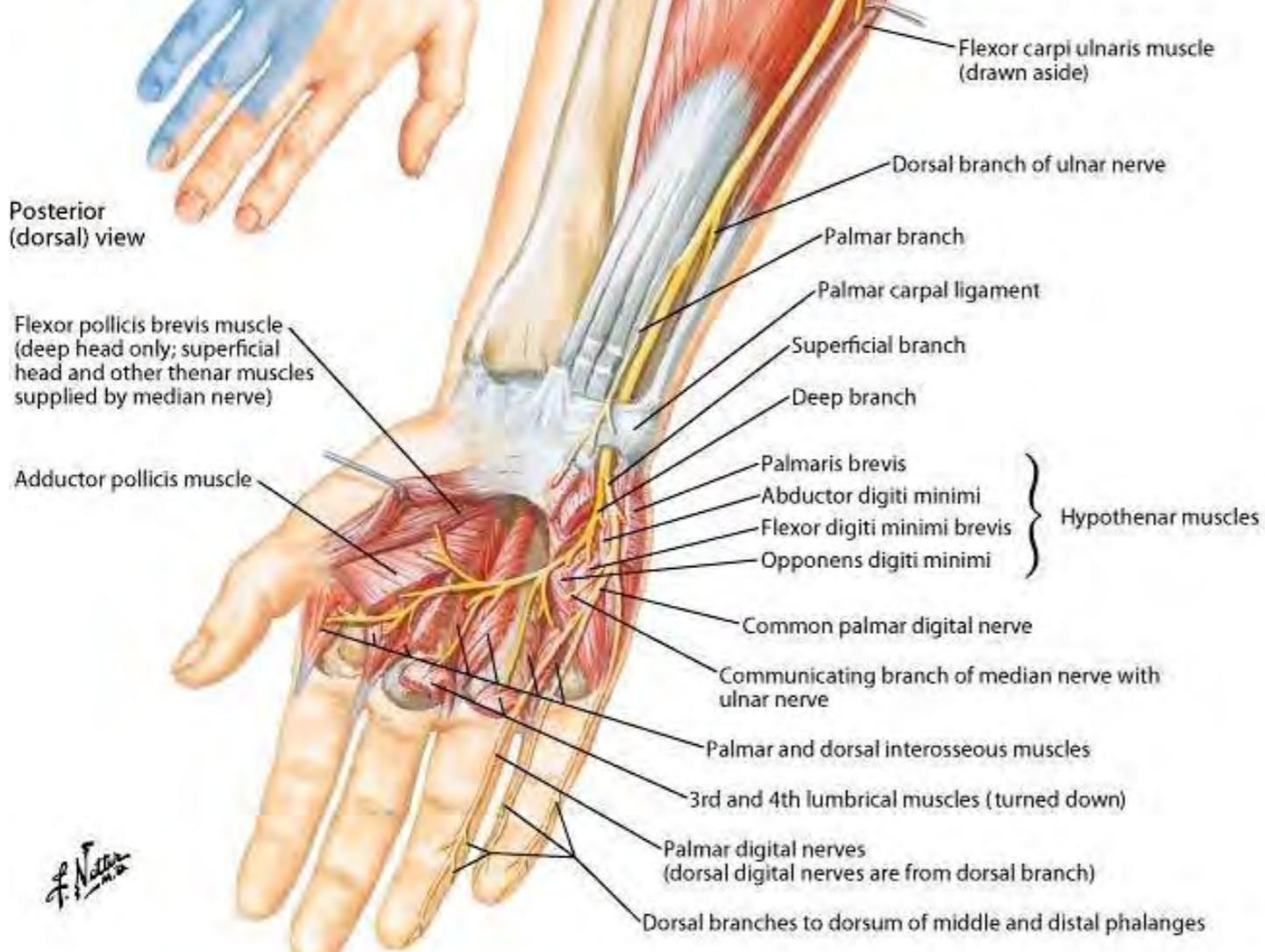
Posterior (dorsal) view

Anterior view

Note: Only muscles innervated by ulnar nerve shown

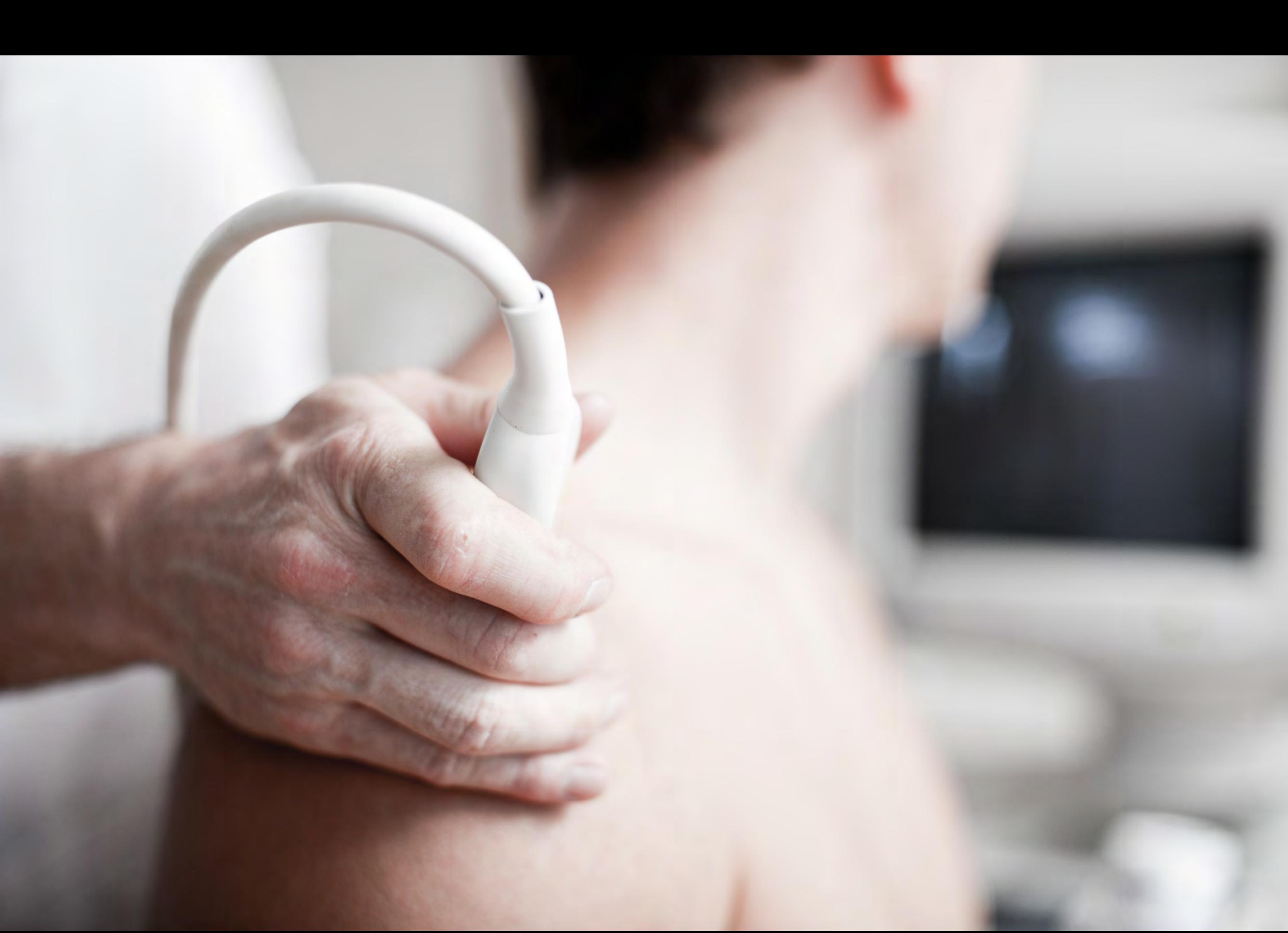


Palmar view



Ulnar nerve

Skulder



01.09.2015 PHILIPS
14:01:21

TERES BERGEN

HD



<
<-
<-

Skulder - E

L12-3

< MI 1,3

TIS 0,3

-F5 Gn 50

232dB/C3

E/2/2

29Hz 4cm

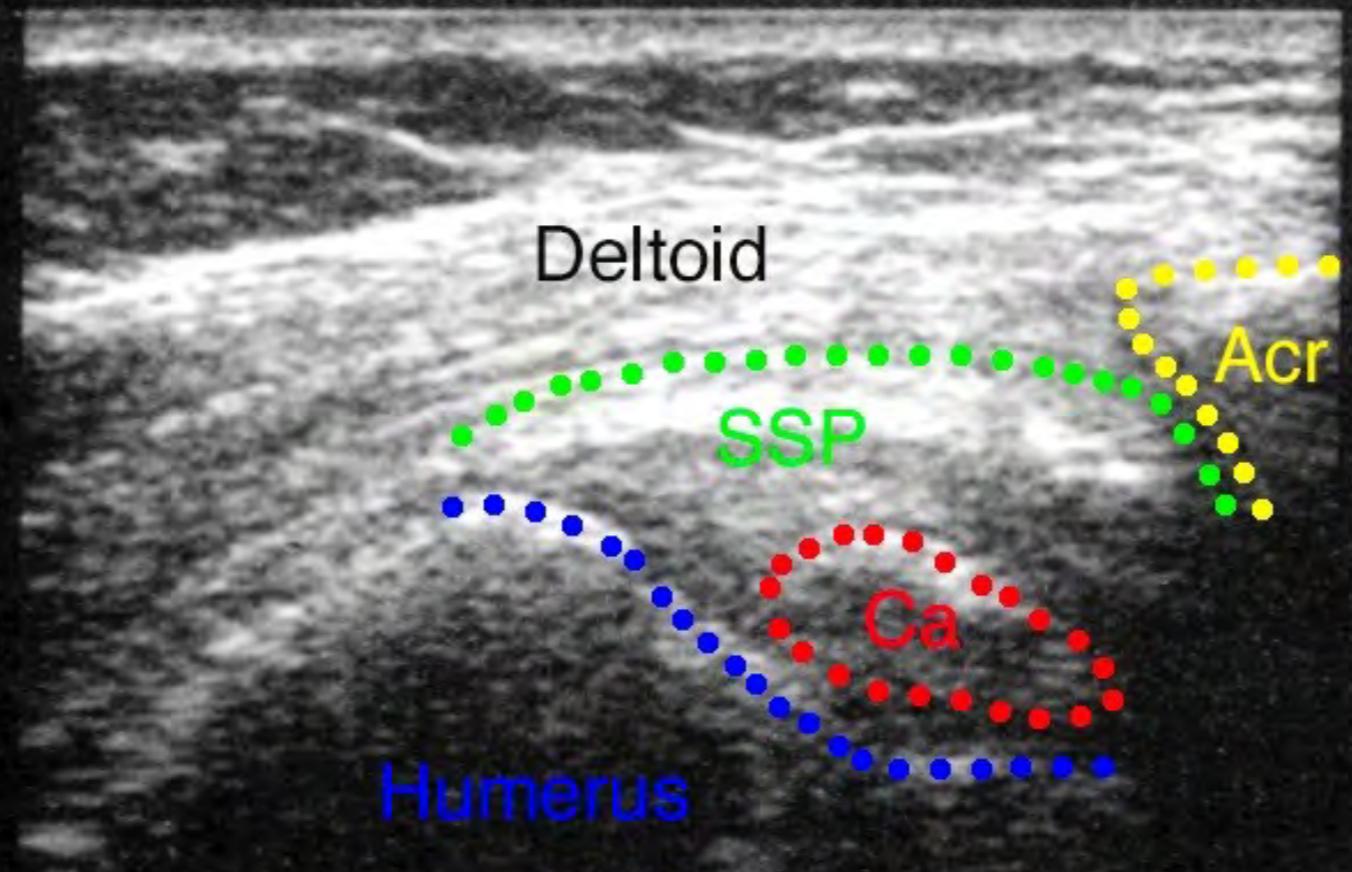
P T
R
3,0 12,0



Off
Size



HD

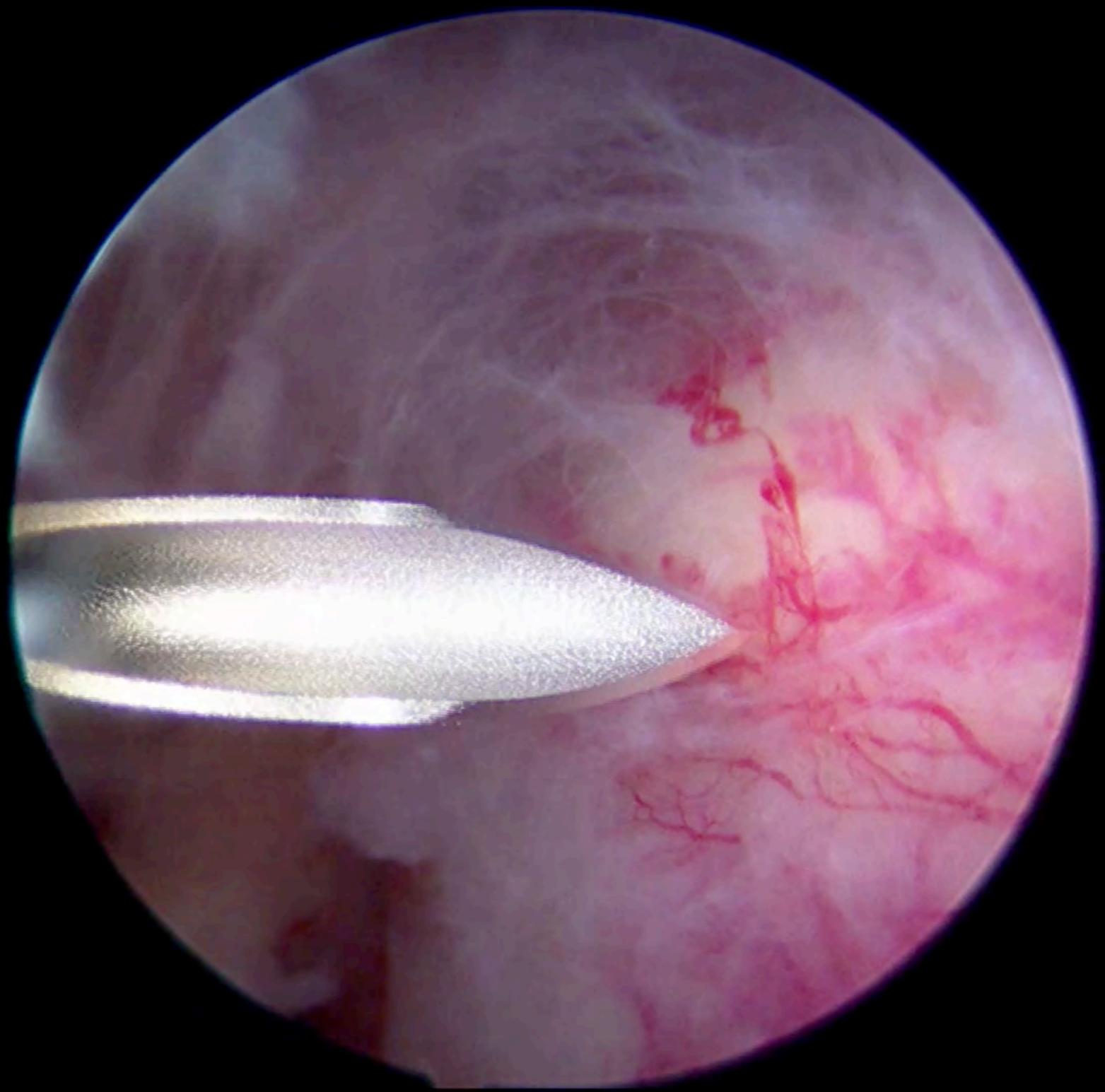


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Skulder - E
L12-3
< MI 1,3
TIS 0,3
-F5 Gn 50
232dB/C3
E / 2 / 2

29Hz 4cm

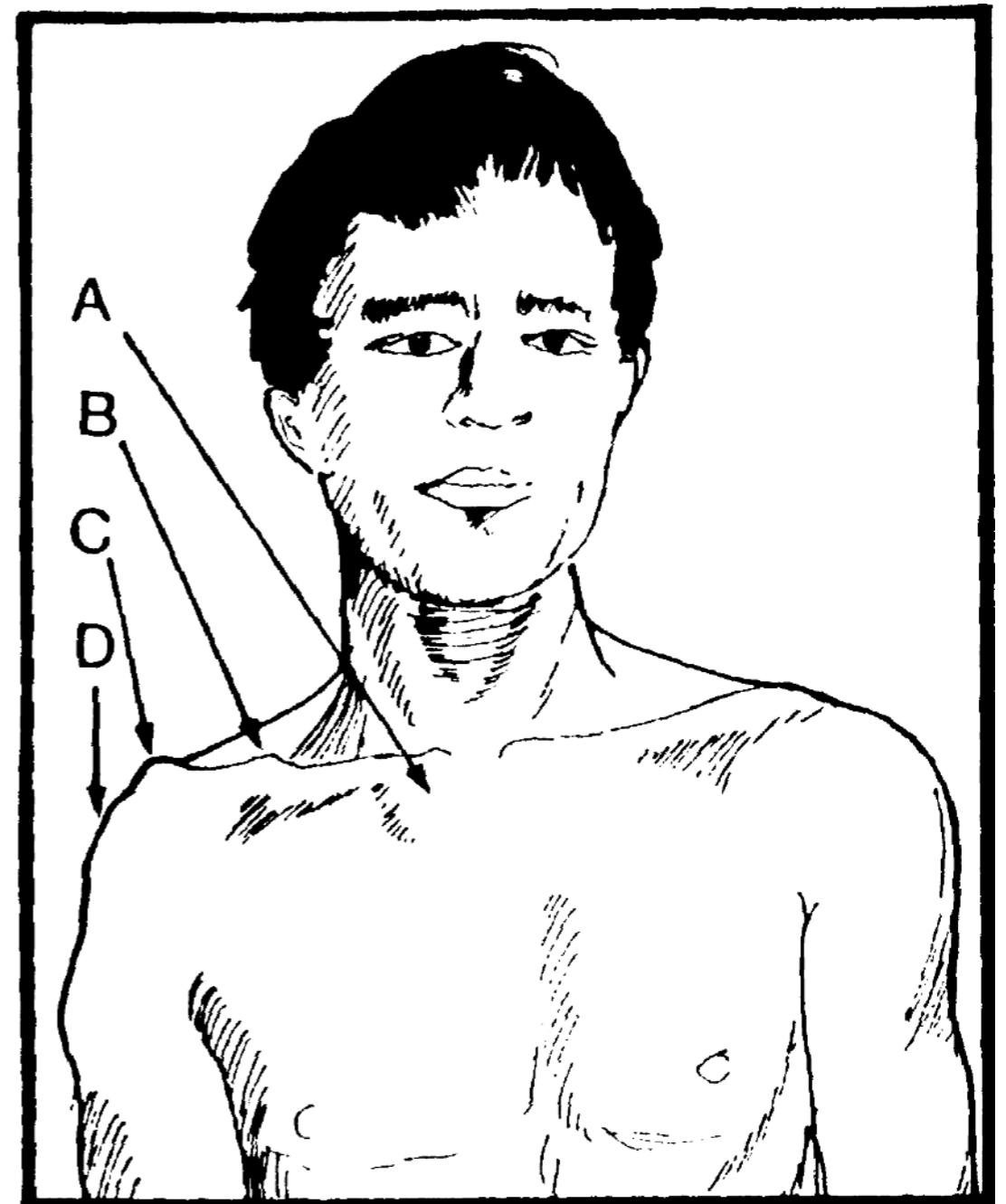
T
P ▲ R
3,0 12,0

Off
Size



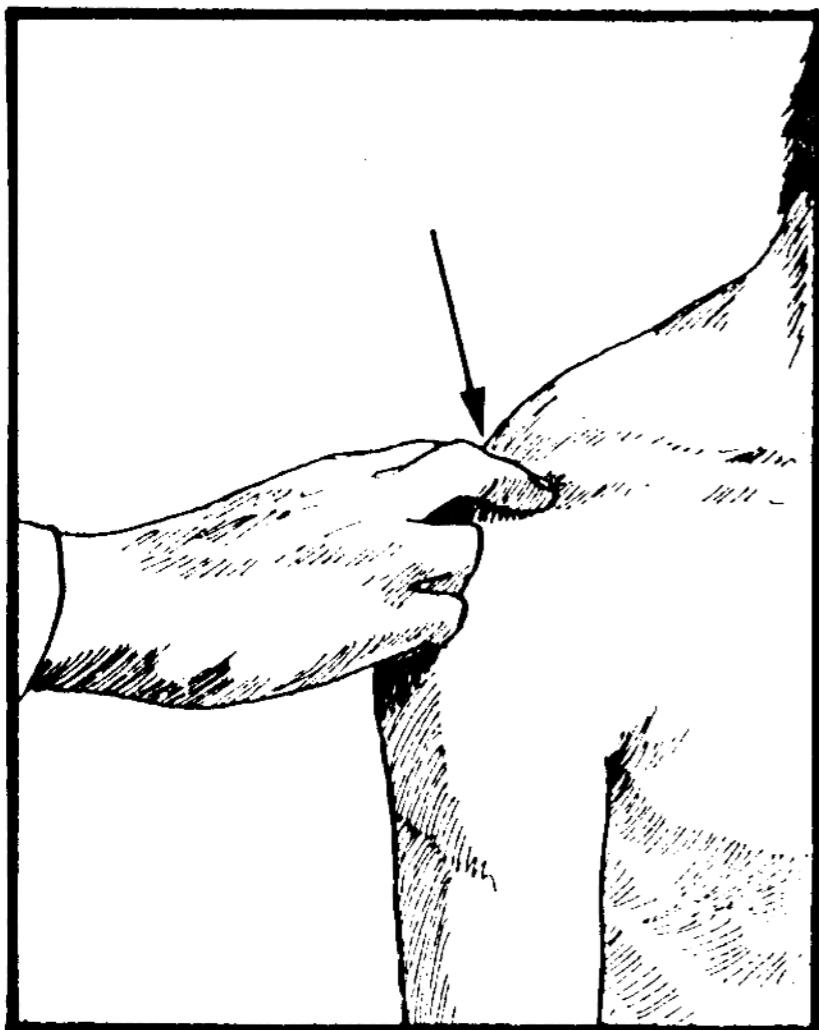
Inspeksjon

- (A) Sternoclavicularledd
- (B) Clavicula (fraktur)
- (C) Acromioclavicularledd
- (D) Deltoid (muskelkontur)

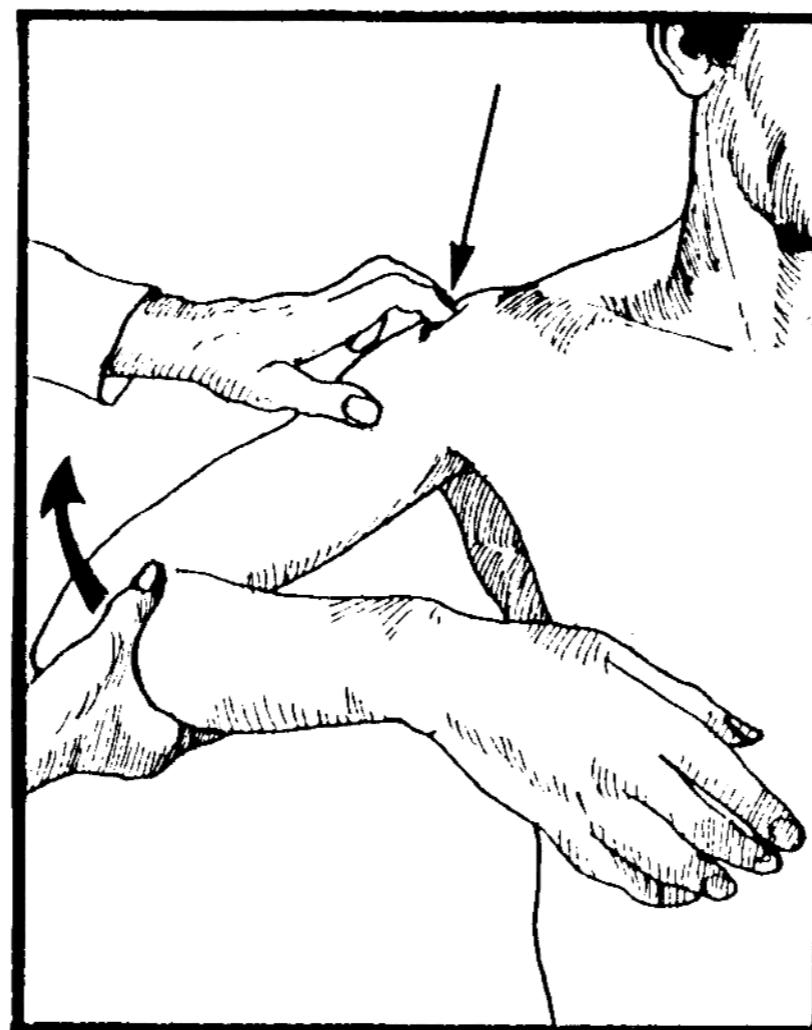


Palpasjon

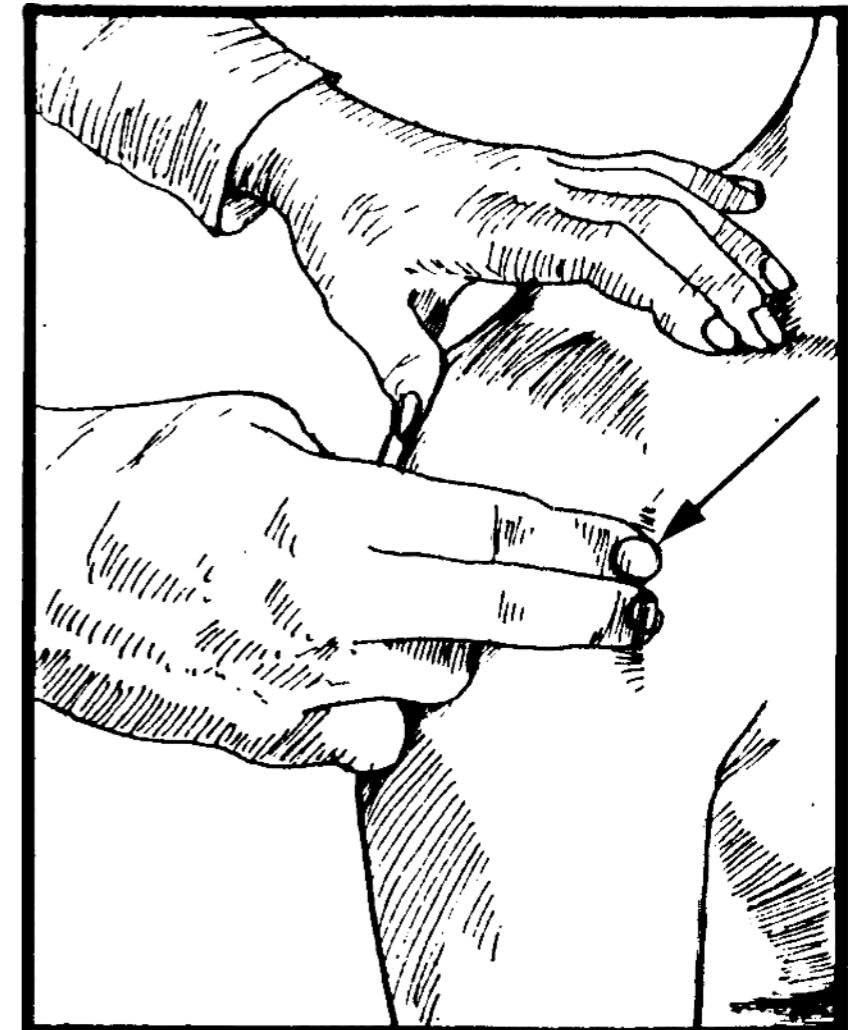
AC-ledd



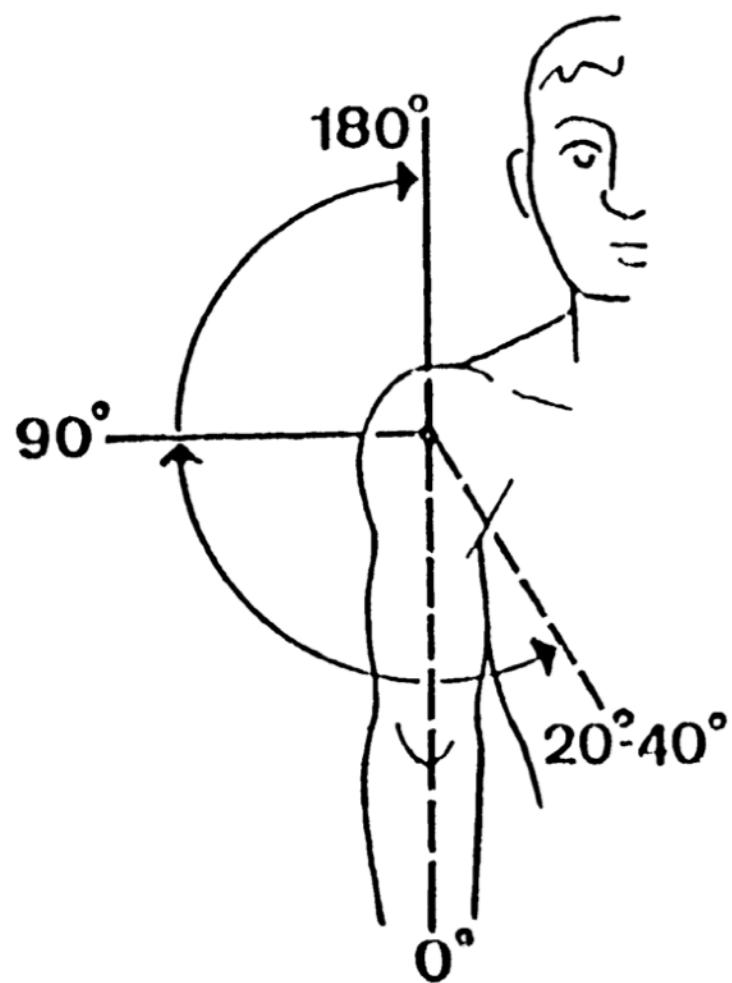
Subacromial bursa



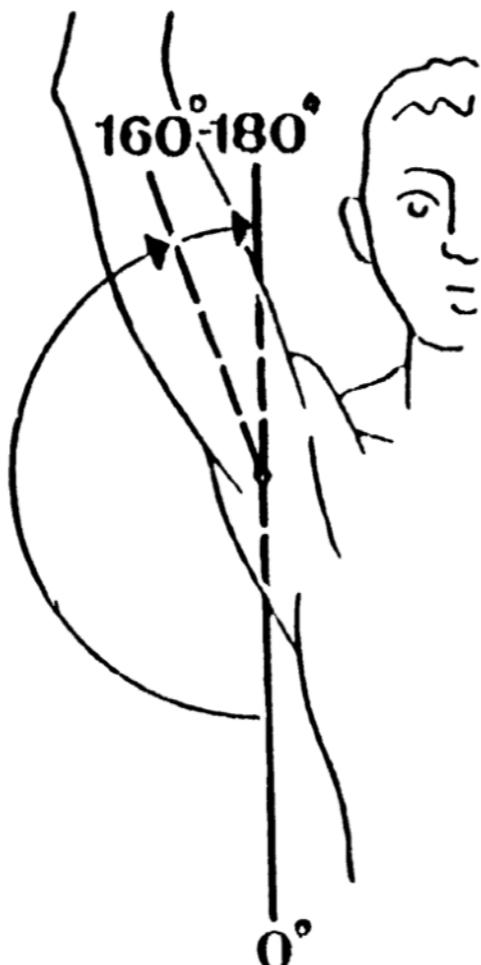
Bicepsfure



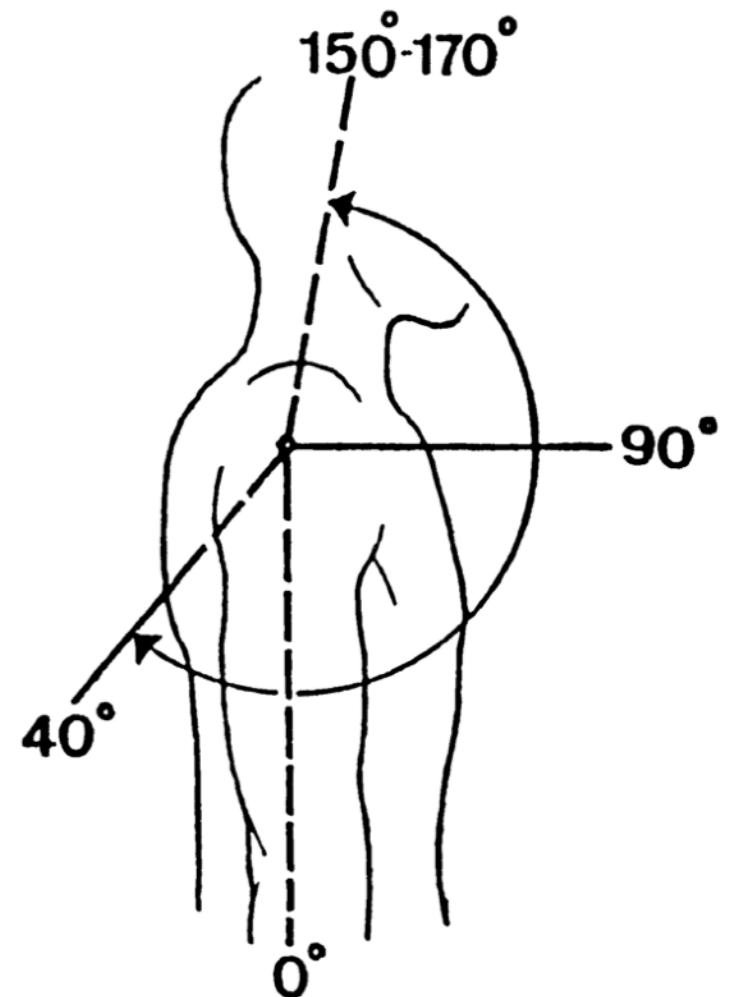
Bevegelse



Abd/adduksjon

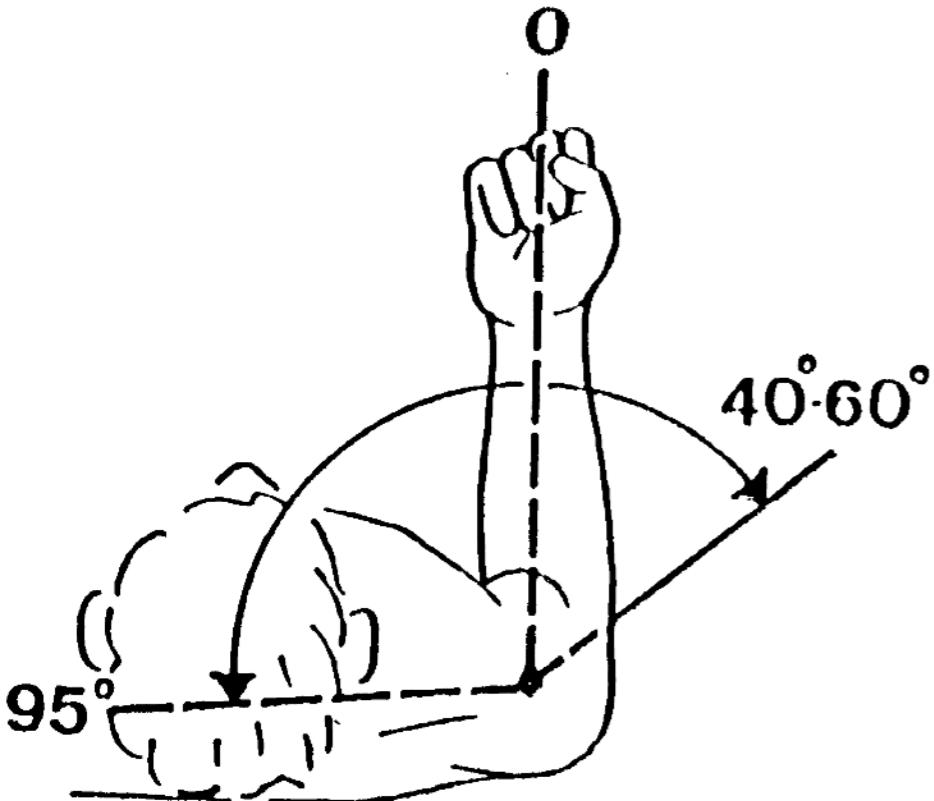


Elevasjon

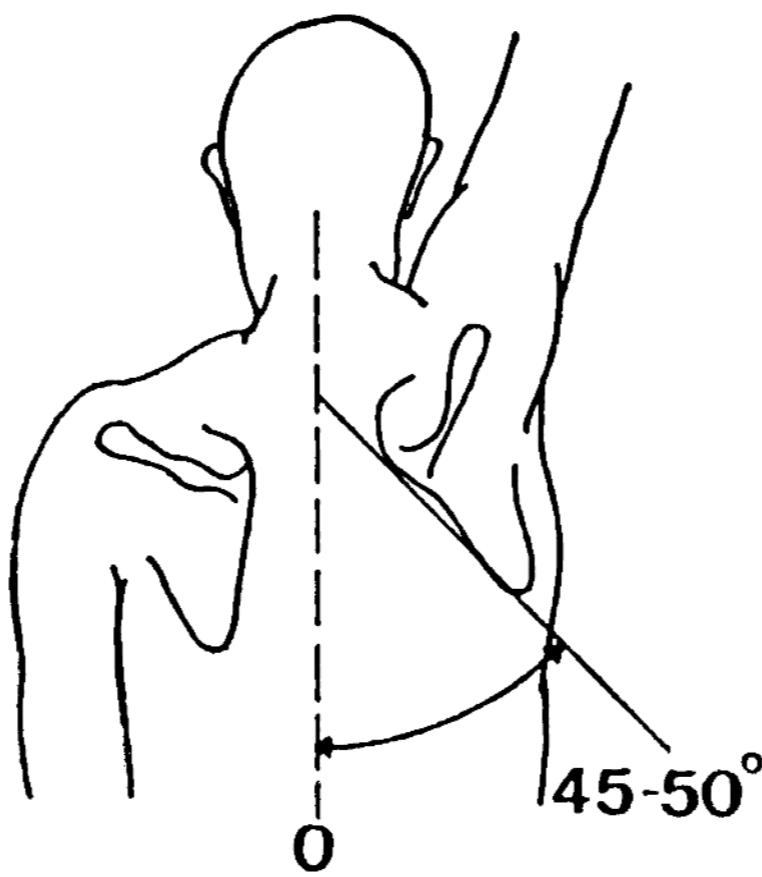


Fleksjon/ekstensjon

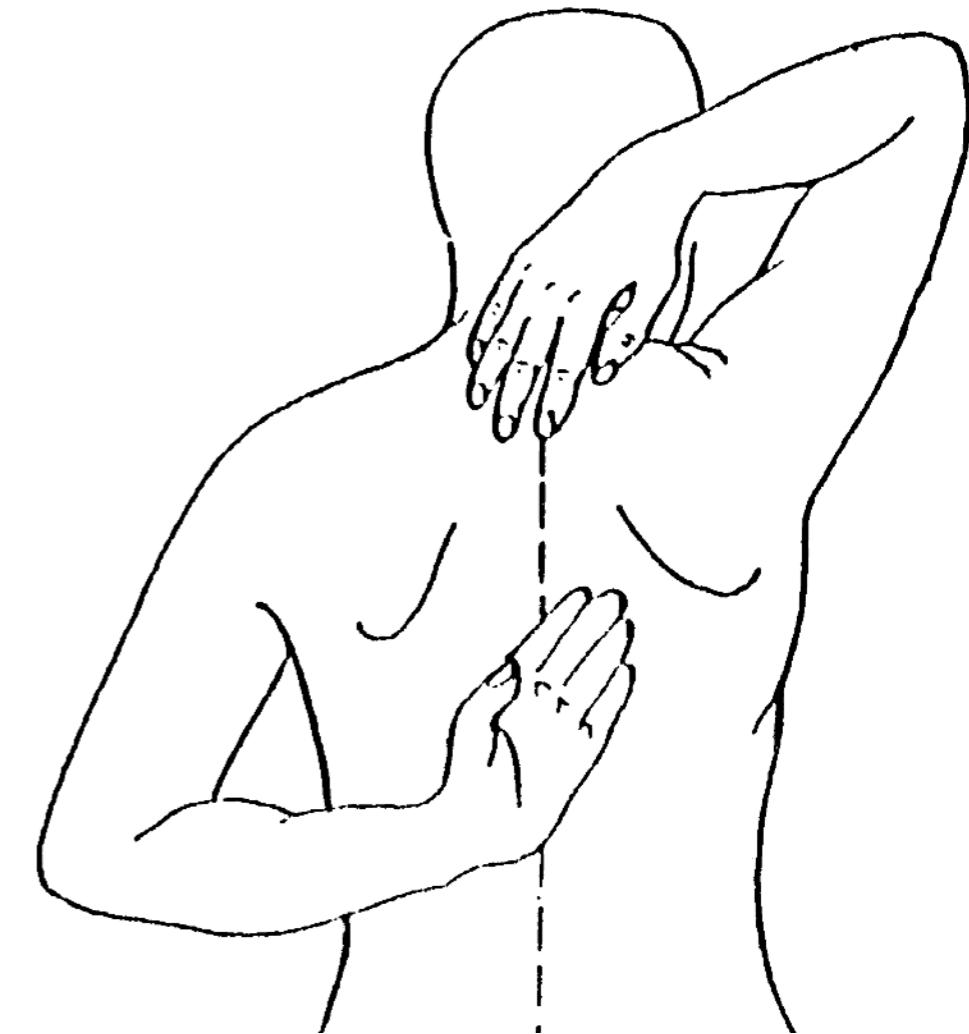
Bevegelse



Innad/utadrotasjon



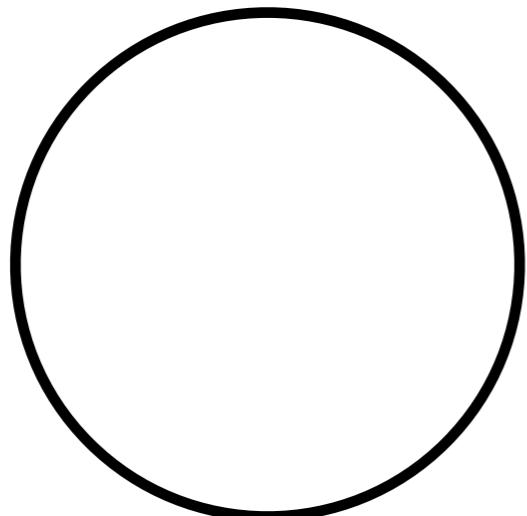
Scapulas
beveglighet



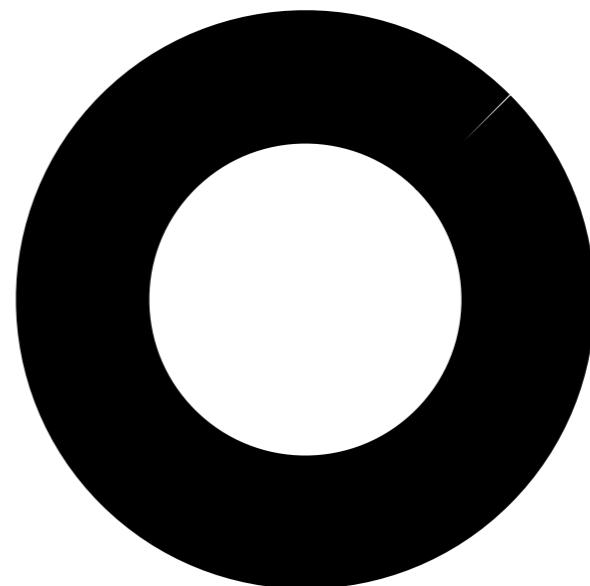
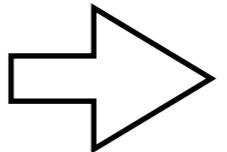
Innad/utadrotasjon

Frossen skulder

kirurgi
traumer
artrose
ideopatisk/
uflaks



tynn og elastisk
kapsel



tykk bacon svor
kapsel

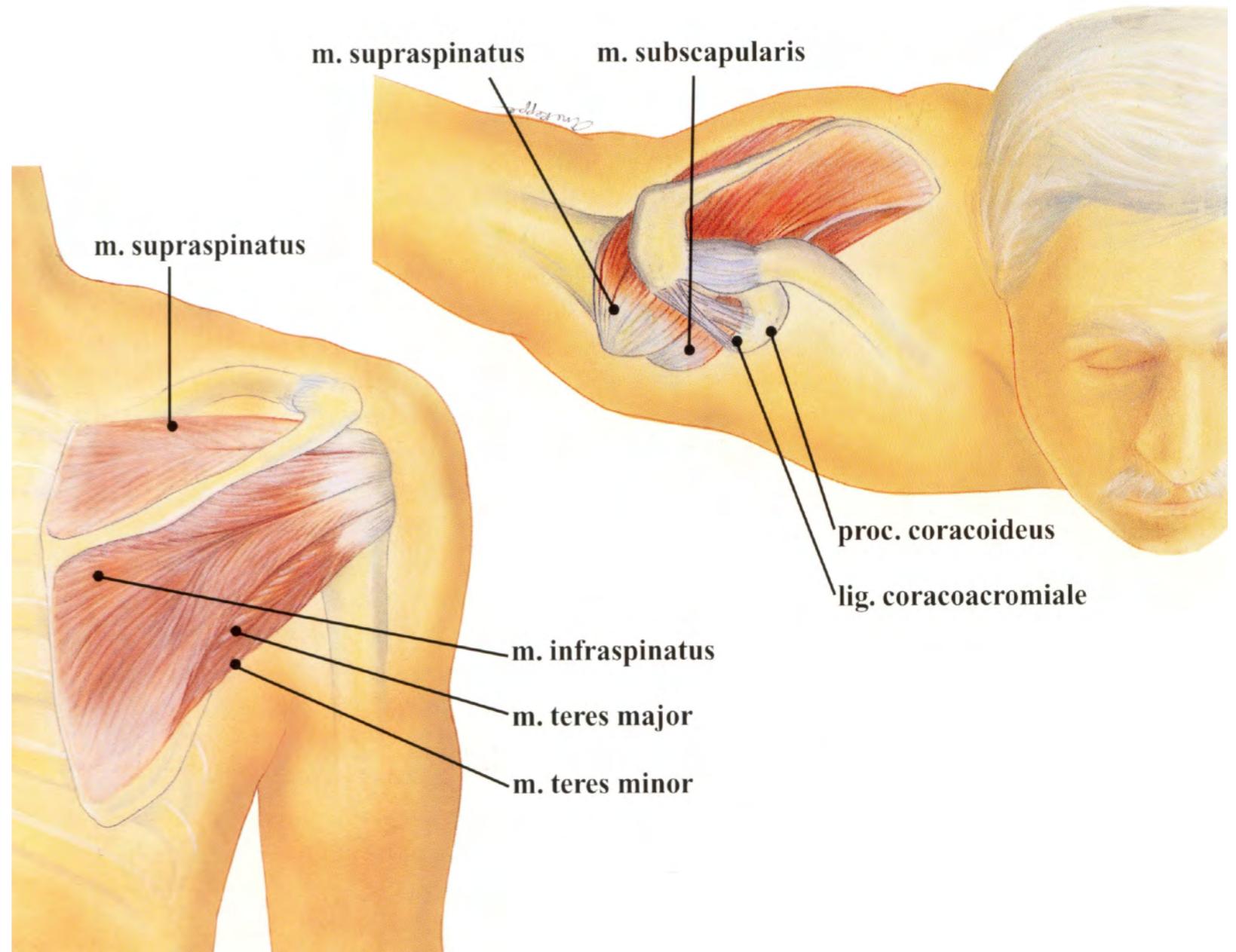
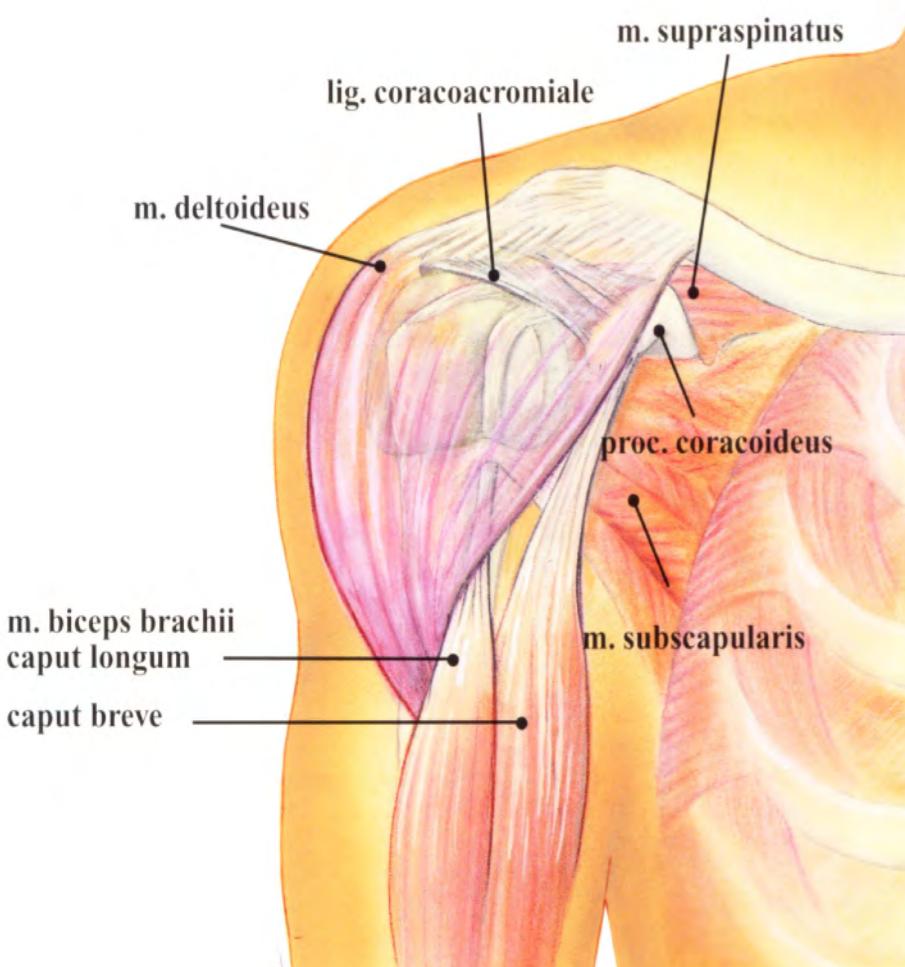
FØR :-)



ETTER :-)



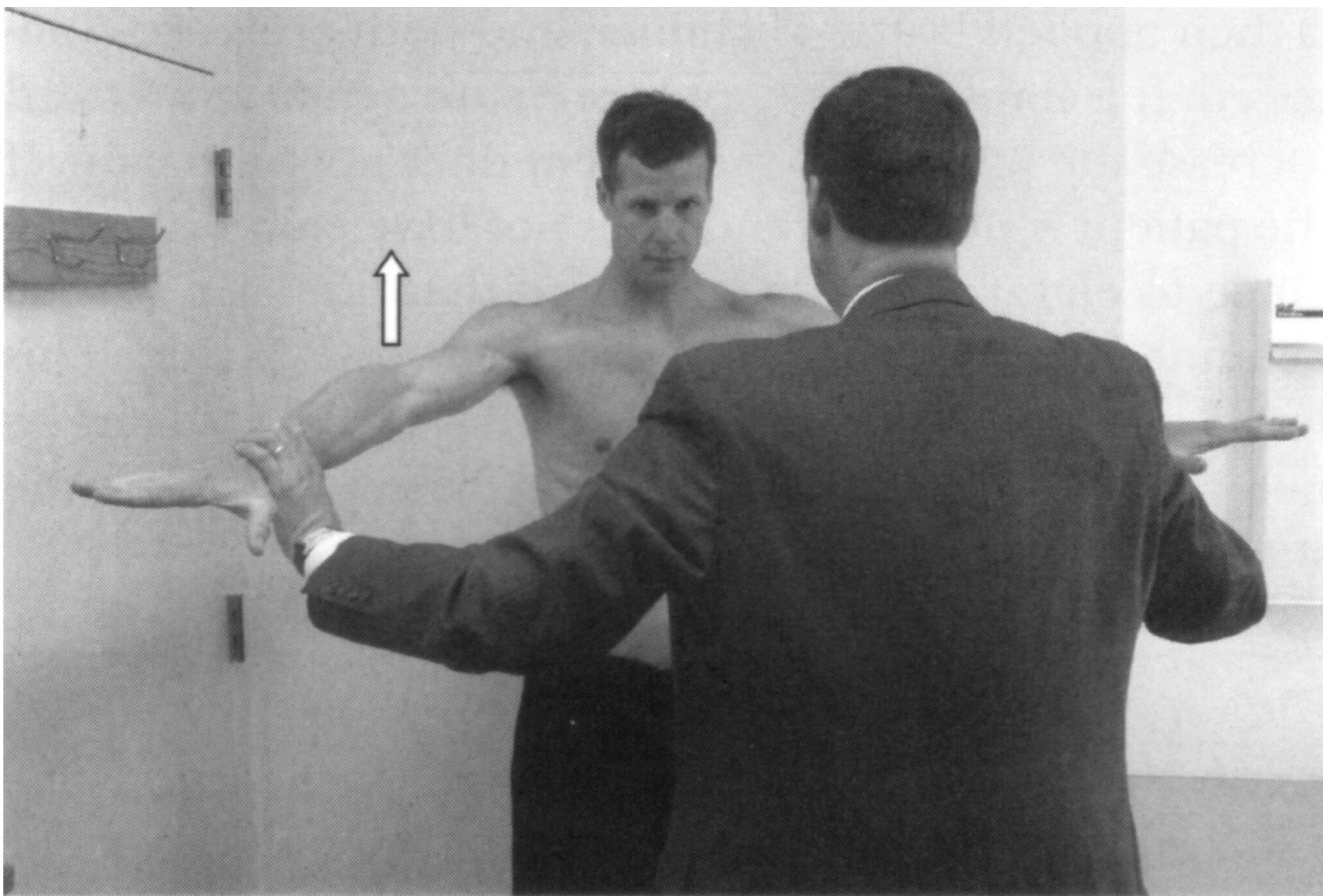
Styrke



Abduksjon

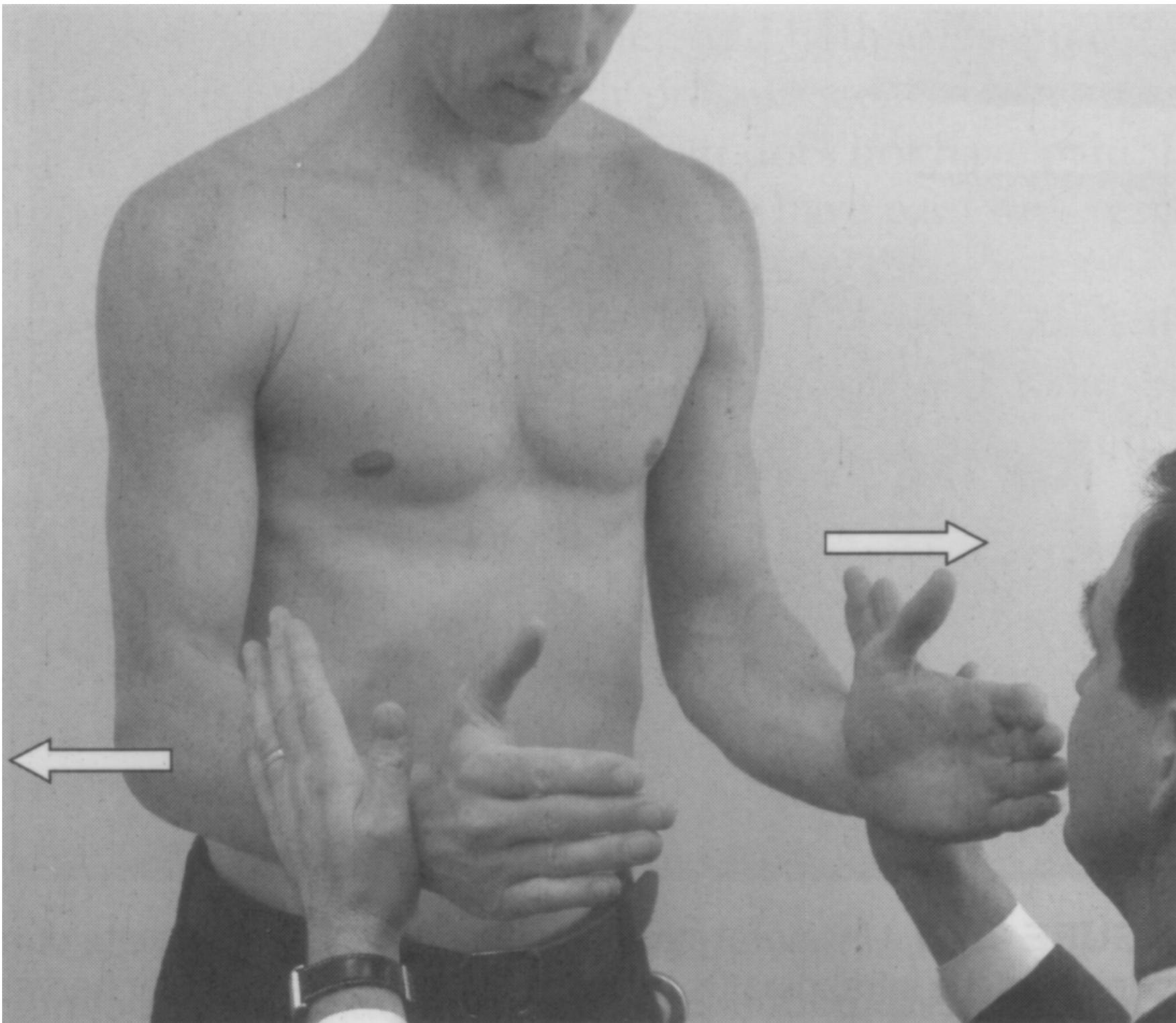
- Supraspinatus
- Deltoideus
- Trapezius (eleverer scapula)

Supraspinatus

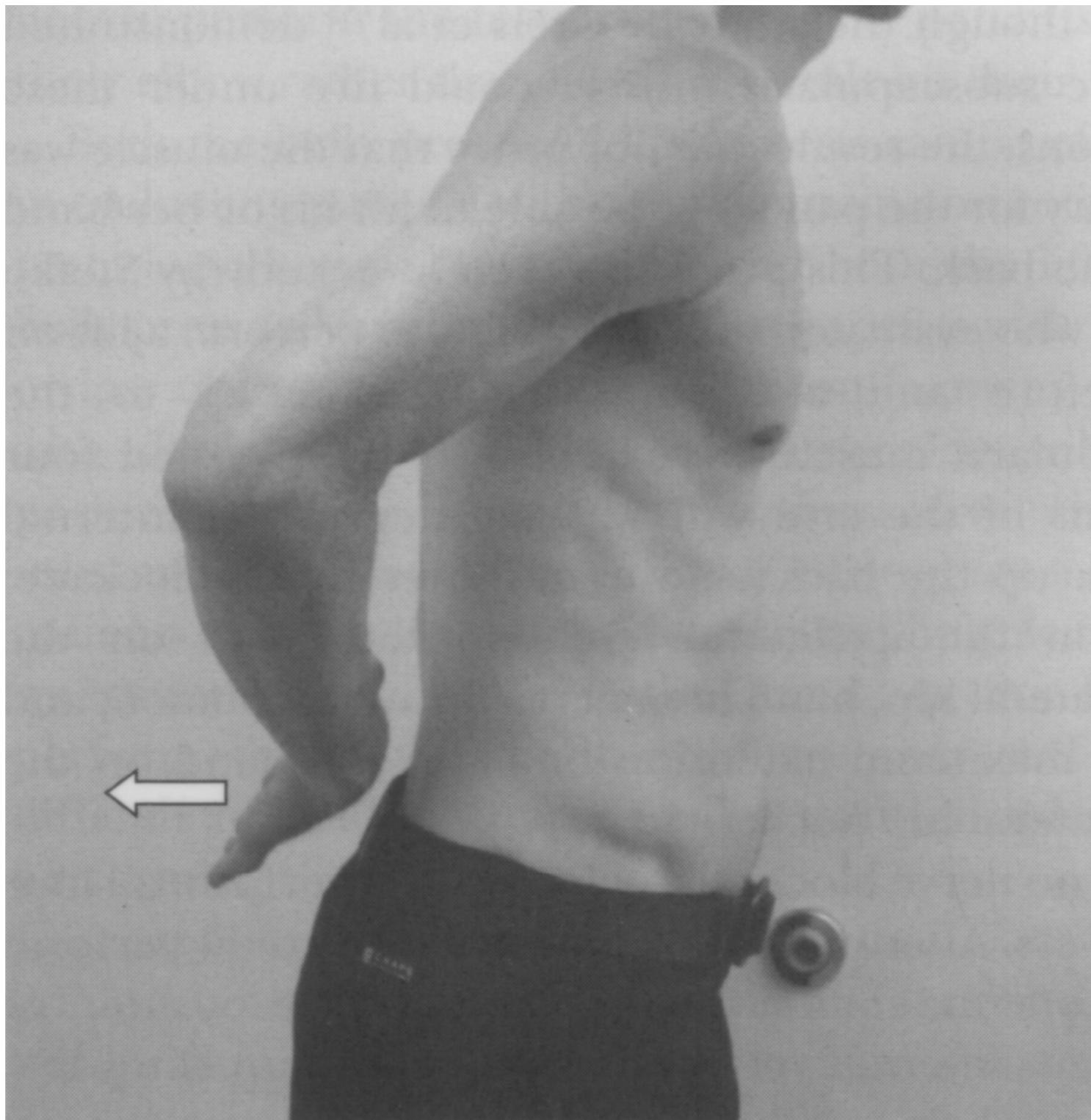




Infraspinatus

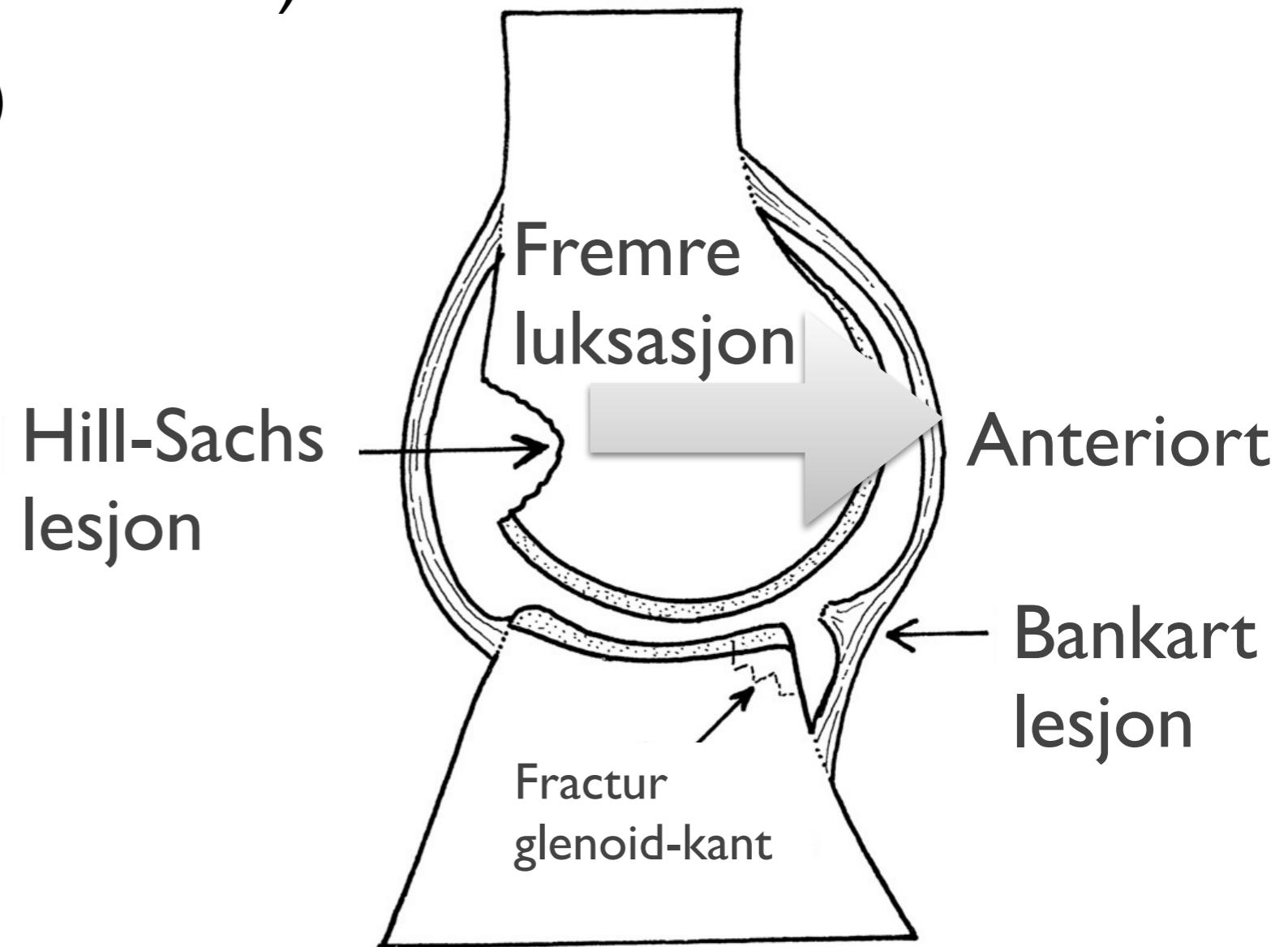


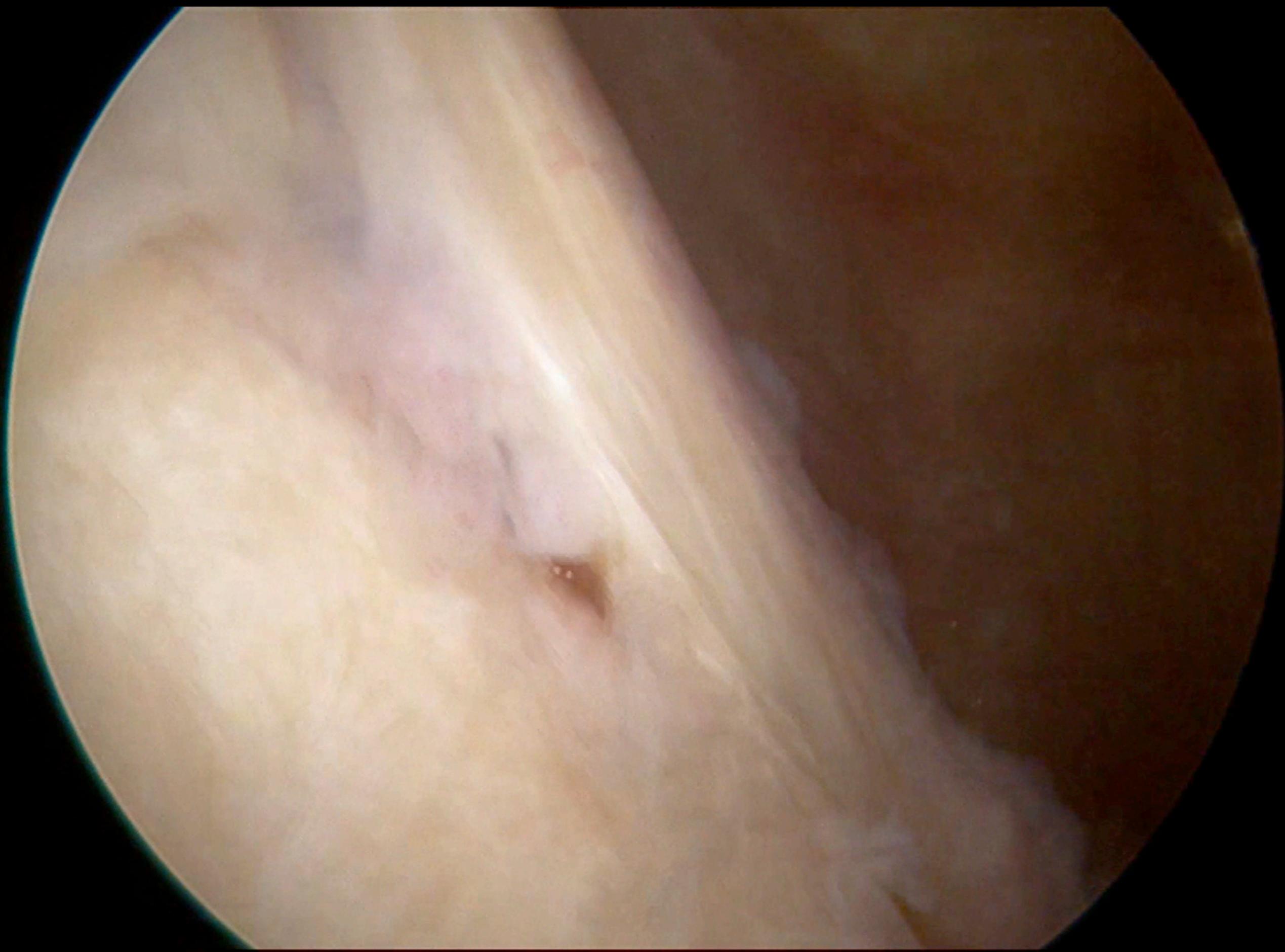
Subscapularis



Stabilitet

- Skuffetest (fremre - bakre)
- Sulcustegn (MDI)
- Spesielle Tester

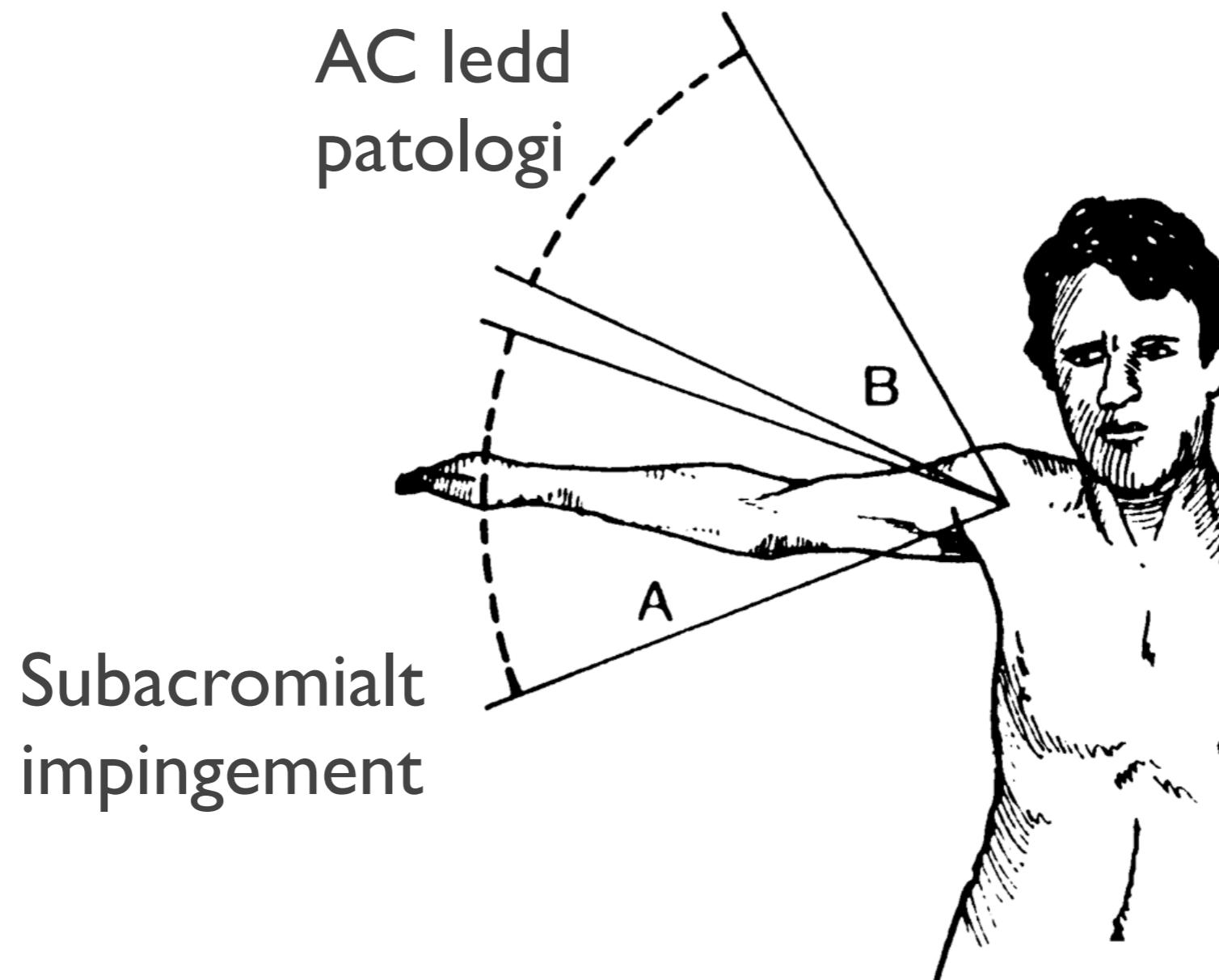




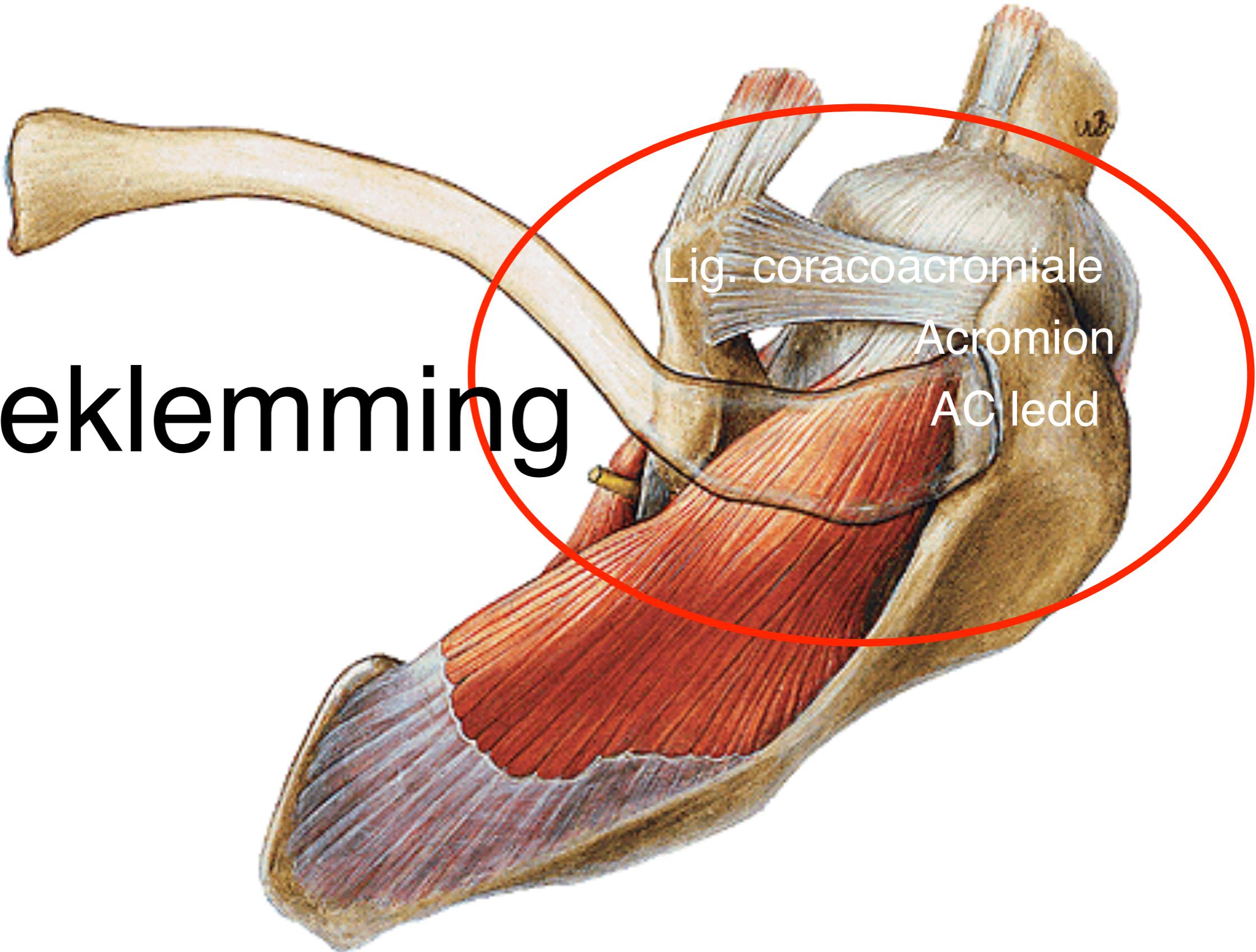
Spesielle tester

- Impingement
 - Neers impingement tegn
 - Hawkins imping. test
- AC ledd
 - Crossed-Body Adduction test
- Instabilitet (fremre)
 - Apprehension & Relocation Tests
- SLAP (Superior Labrum Anterior to Posterior)
 - O'Briens test

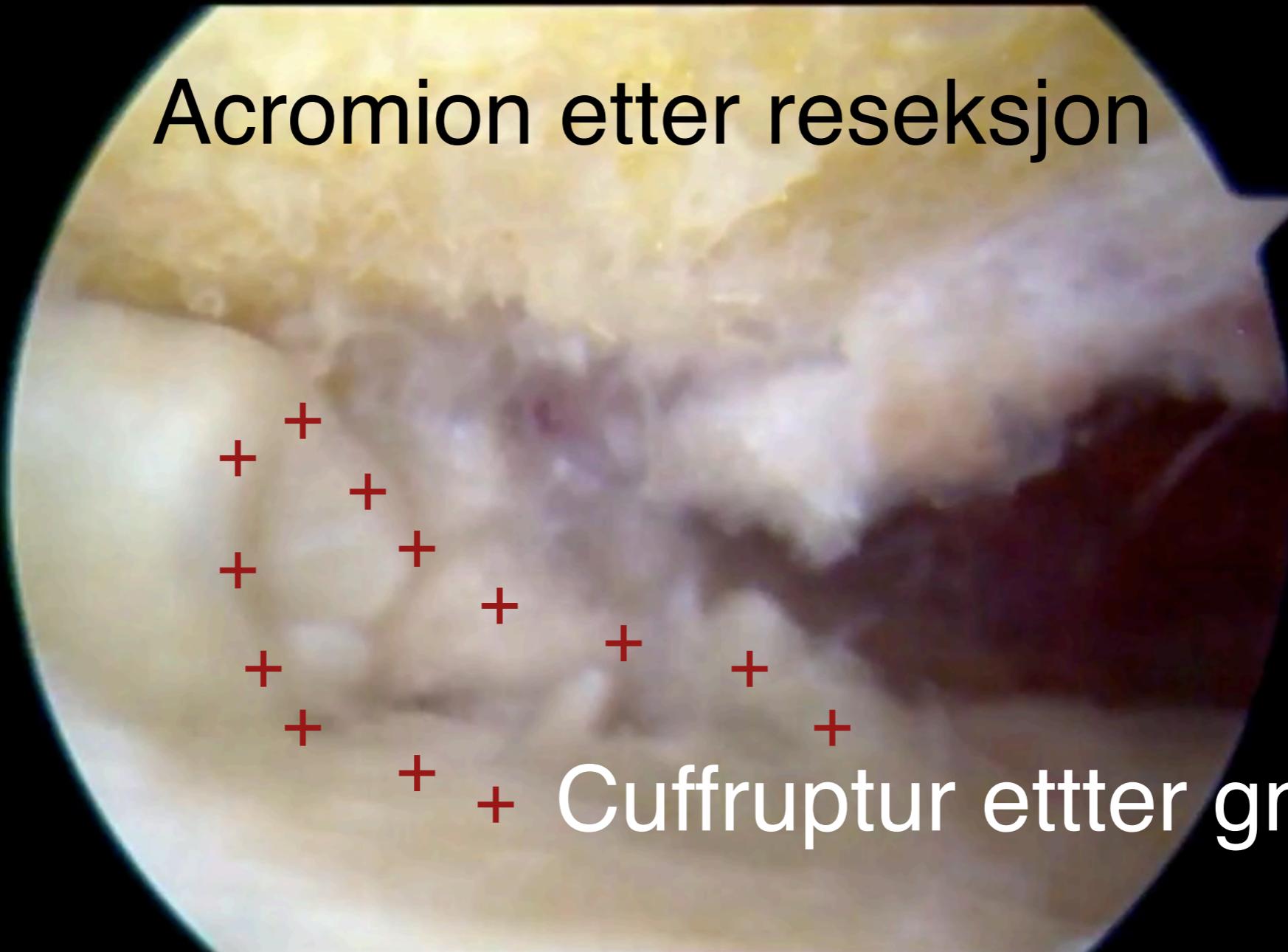
Painful Arch



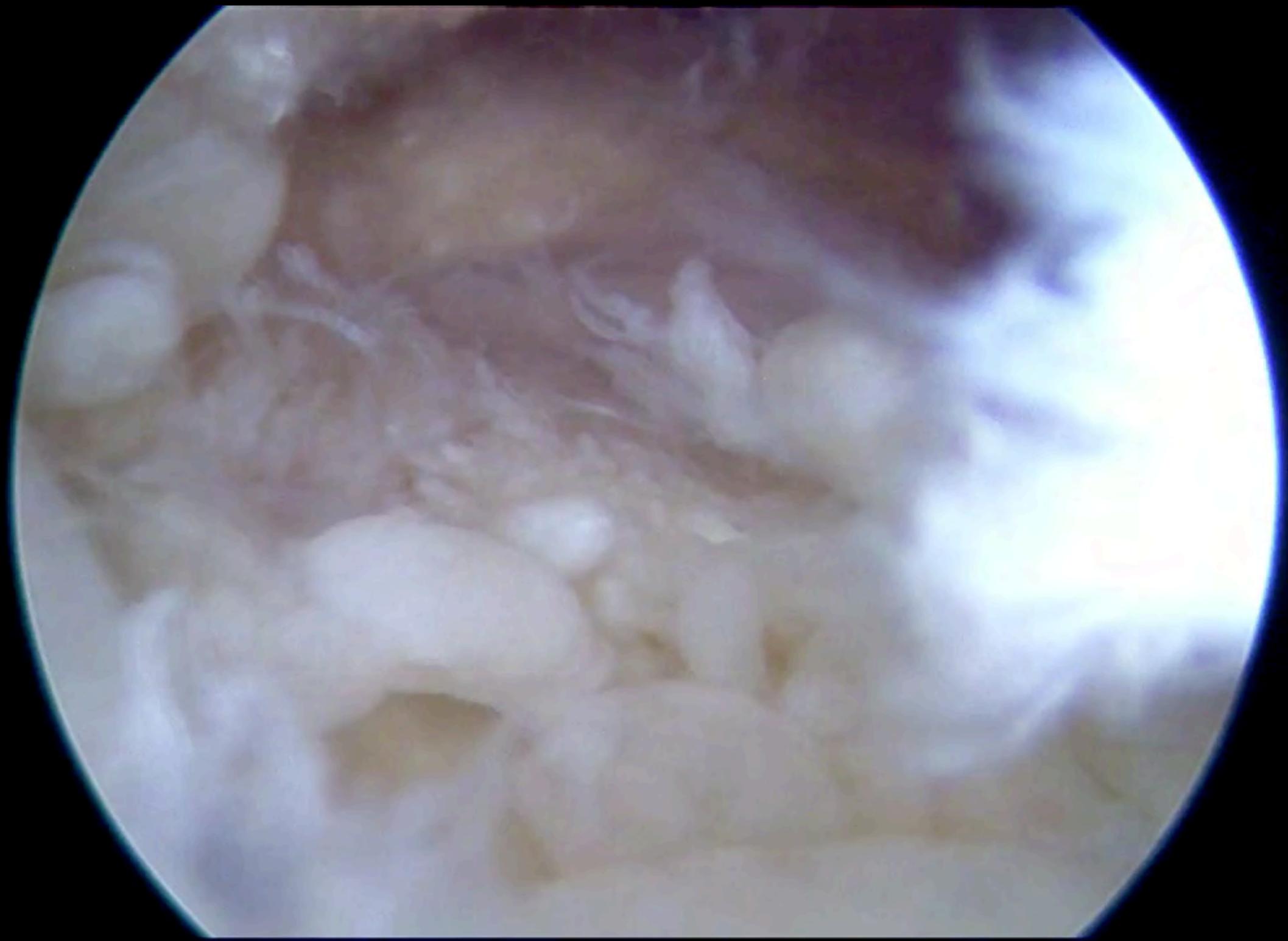
Inneklemming



Acromion etter reseksjon



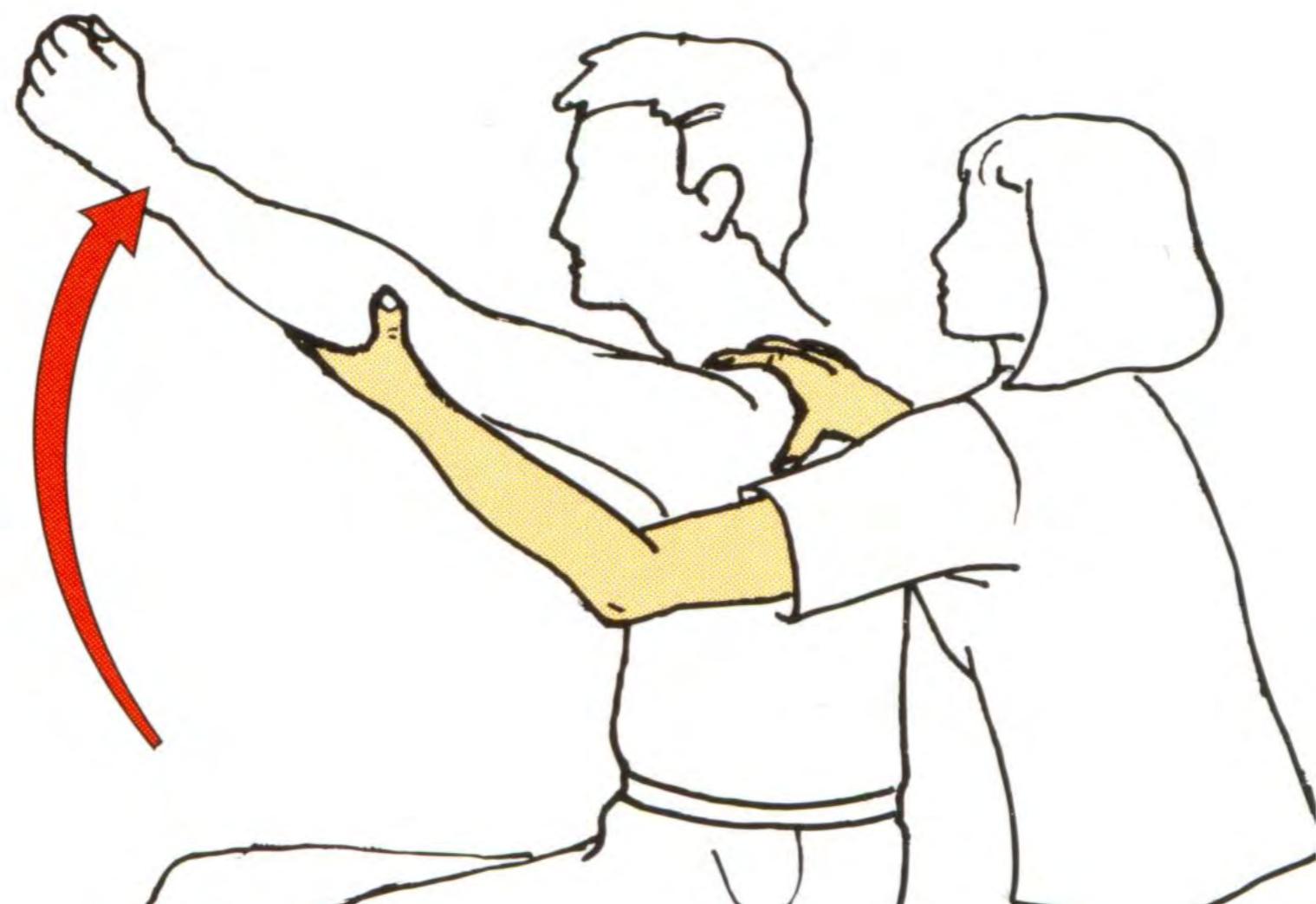
+ Cuffruptur etter gnag



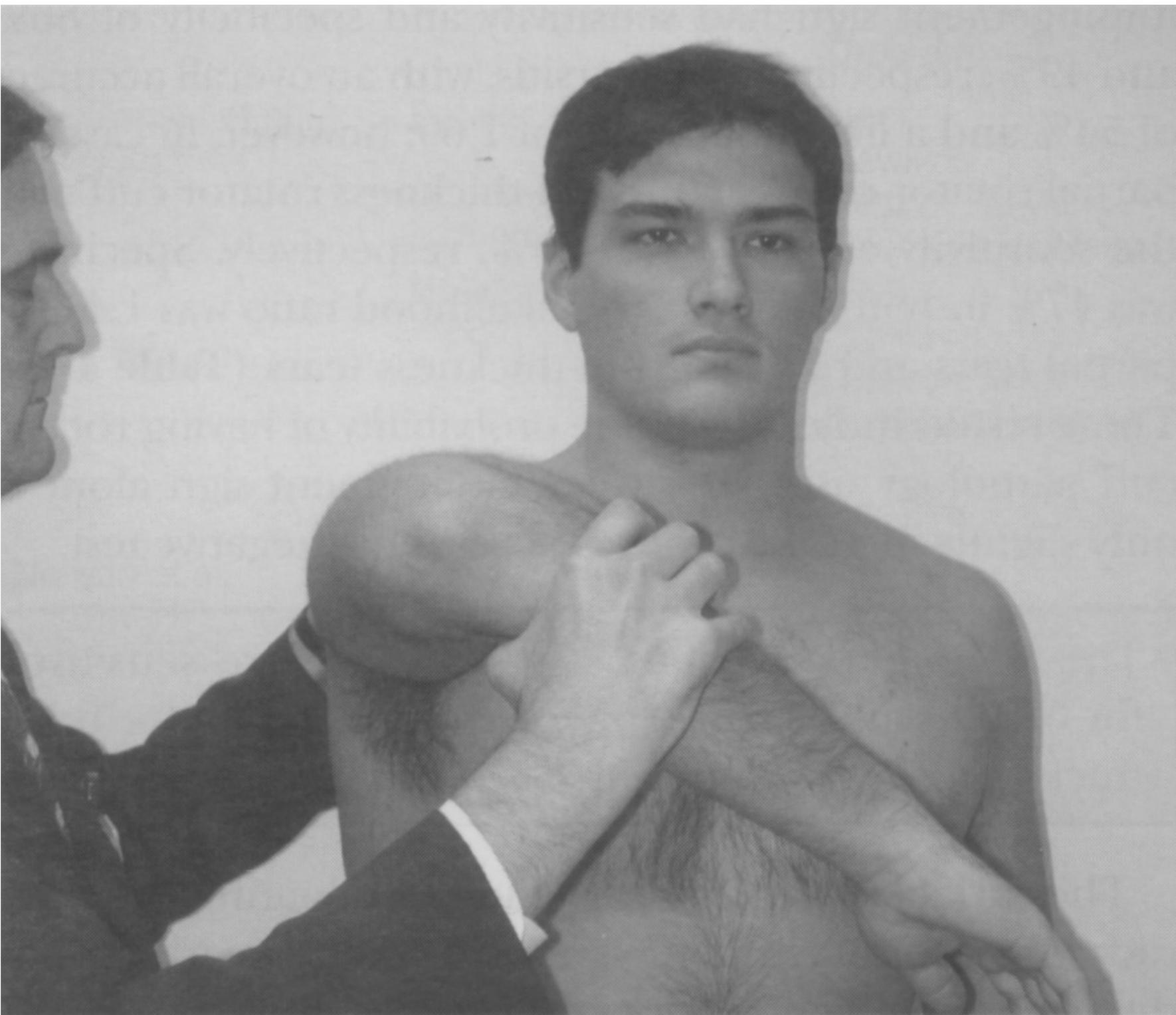
Spesielle tester

- Impingement
 - Neers impingement tegn
 - Hawkins imping. test
- AC ledd
 - Crossed-Body Adduction test
- Instabilitet (fremre)
 - Apprehension & Relocation Tests
- SLAP (Superior Labrum Anterior to Posterior)
 - O'Briens test

Neers Tegn



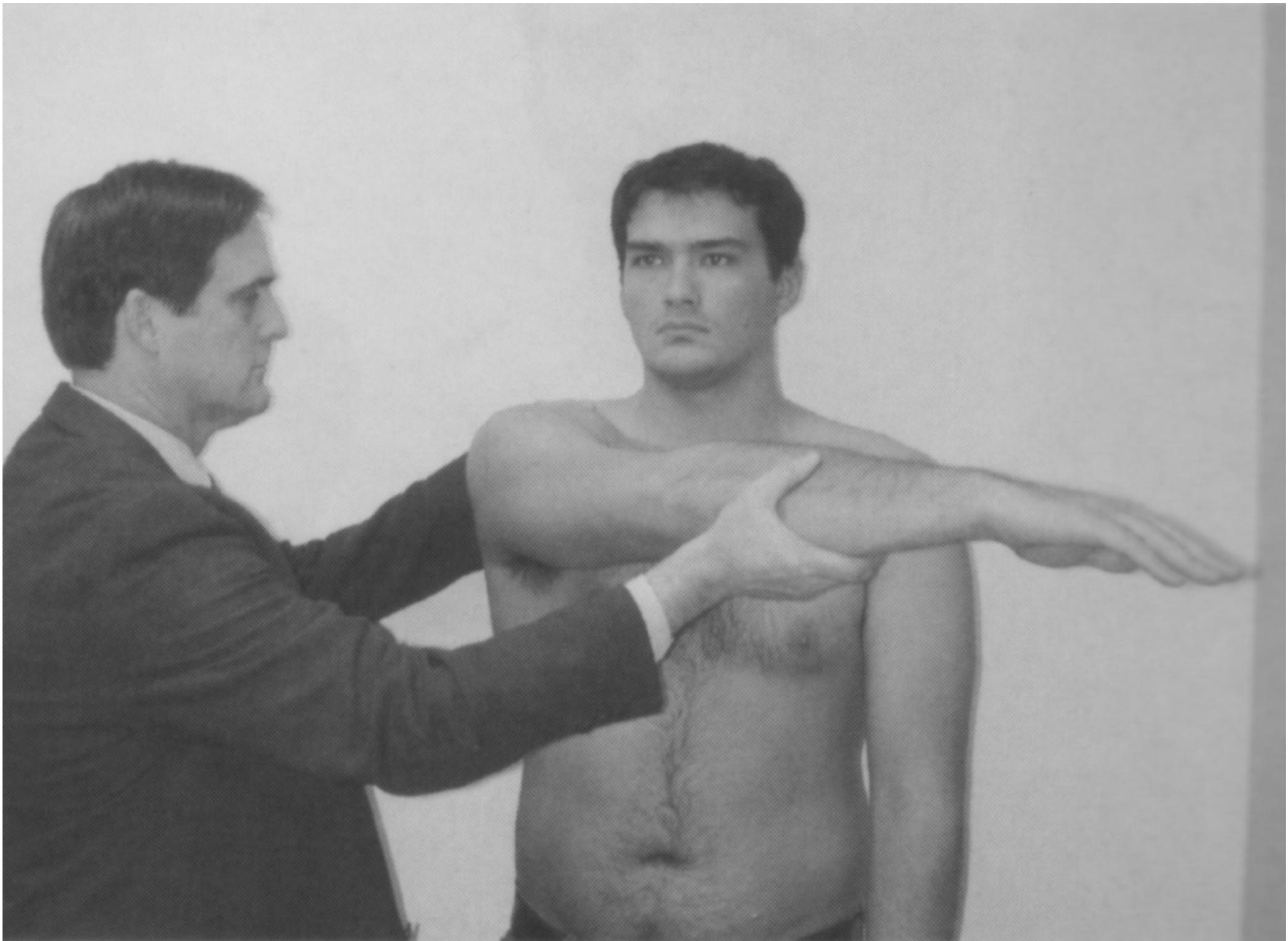
Hawkins Test



Spesielle tester

- Impingement
 - Neers impingement tegn
 - Hawkins imping. test
- AC ledd
 - **Crossed-Body Adduction test**
- Instabilitet (fremre)
 - Apprehension & Relocation Tests
- SLAP (Superior Labrum Anterior to Posterior)
 - O'Briens test

Crossed-Body Add. Test



One-Finger AC Test



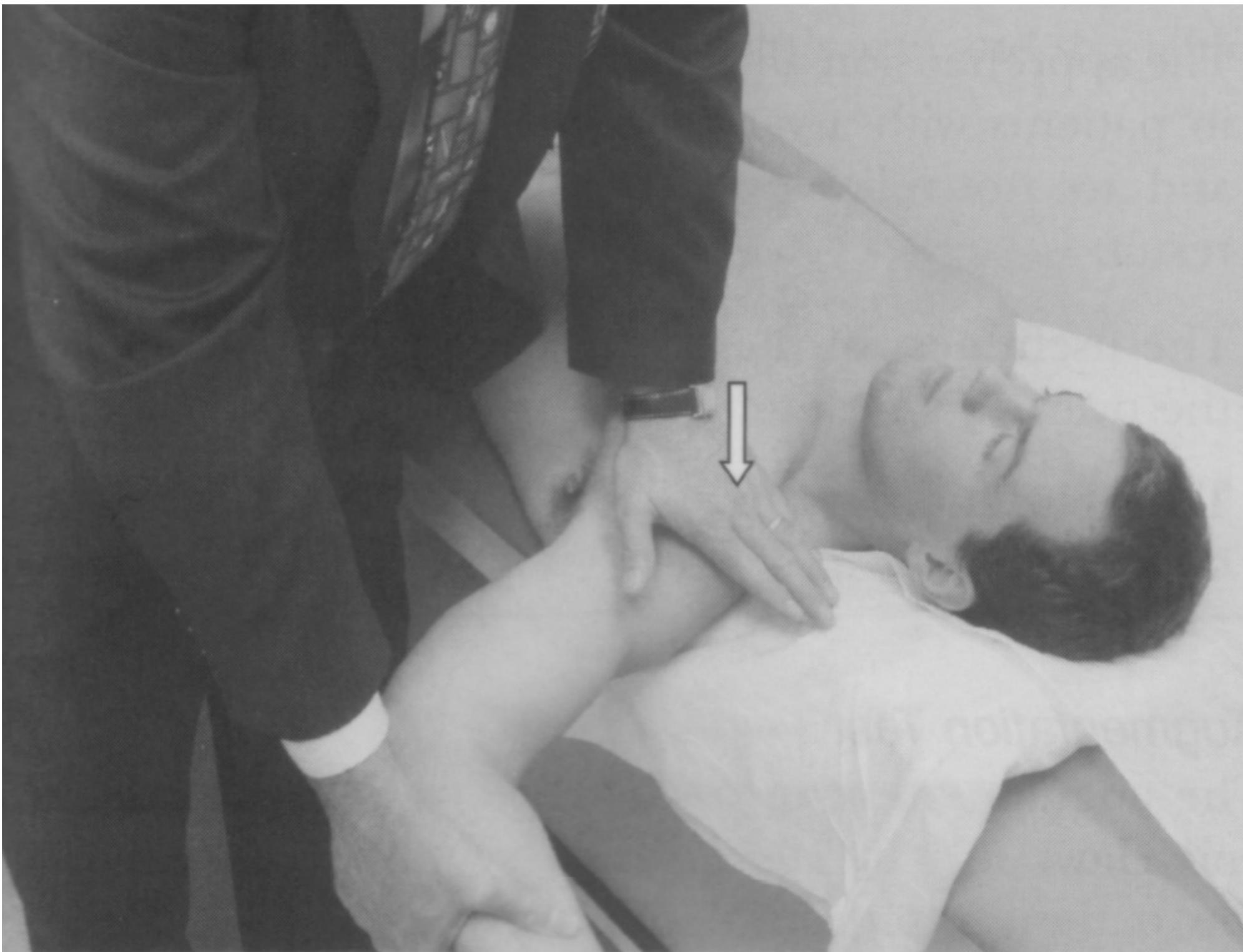
Spesielle tester

- Impingement
 - Neers impingement tegn
 - Hawkins imping. test
- AC ledd
 - Crossed-Body Adduction test
- Instabilitet (fremre)
 - Apprehension & Relocation Tests
- SLAP (Superior Labrum Anterior to Posterior)
 - O'Briens test

Apprehension Test



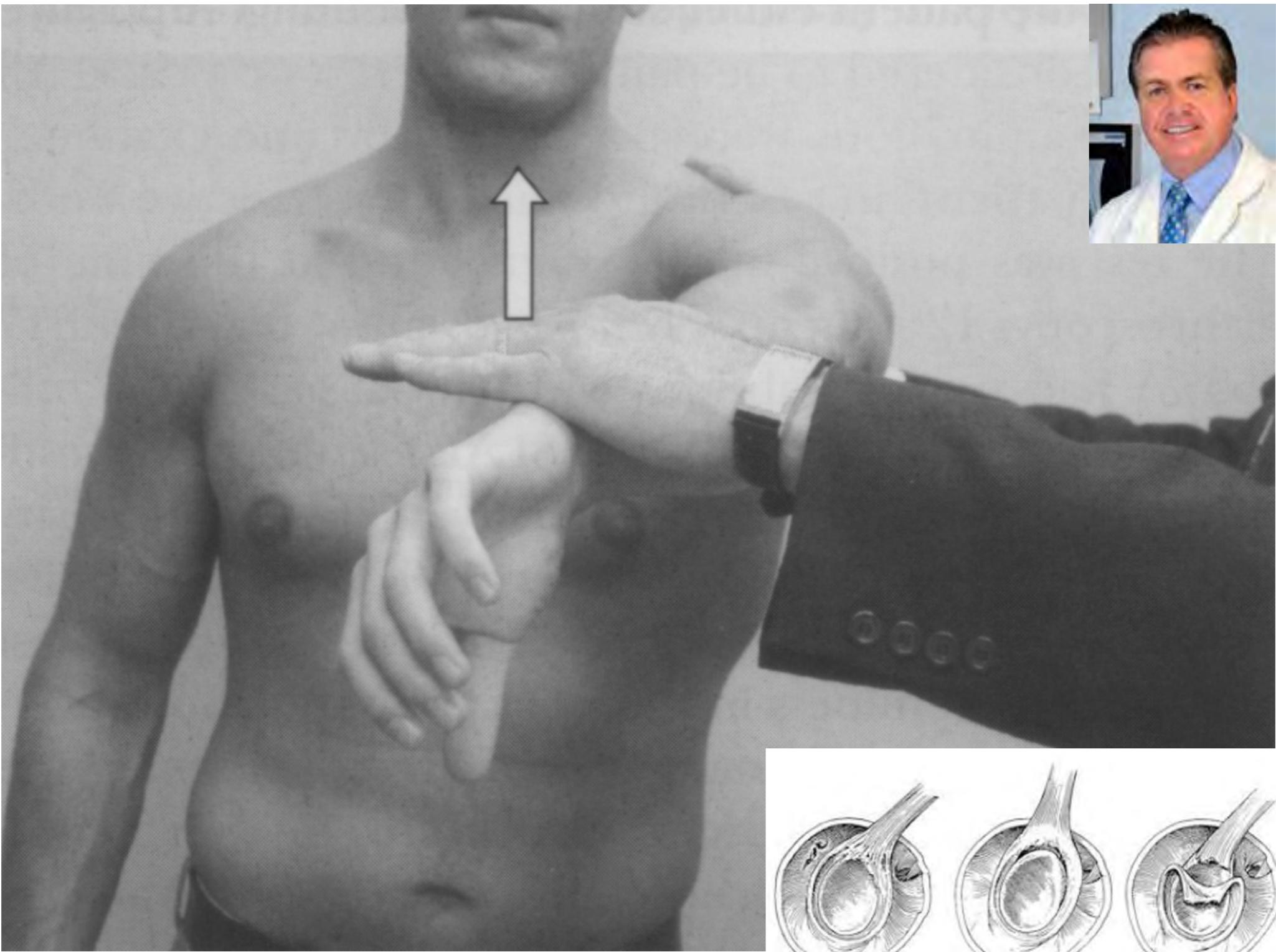
Relocation Test

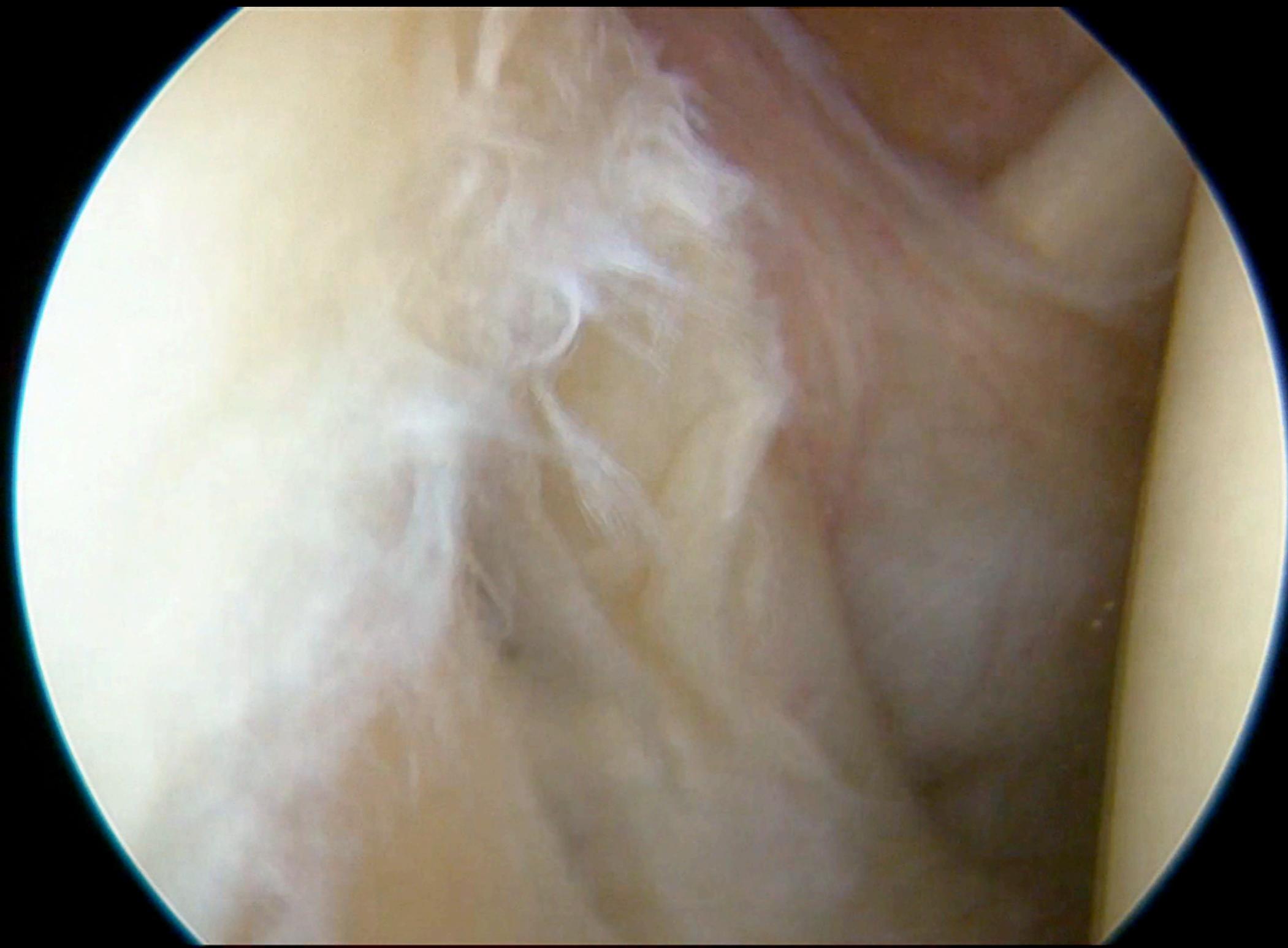


Spesielle tester

- Impingement
 - Neers impingement tegn
 - Hawkins imping. test
- AC ledd
 - Crossed-Body Adduction test
- Instabilitet (fremre)
 - Apprehension & Relocation Tests
- SLAP (Superior Labrum Anterior to Posterior)
 - O'Briens test

O'Briens Test





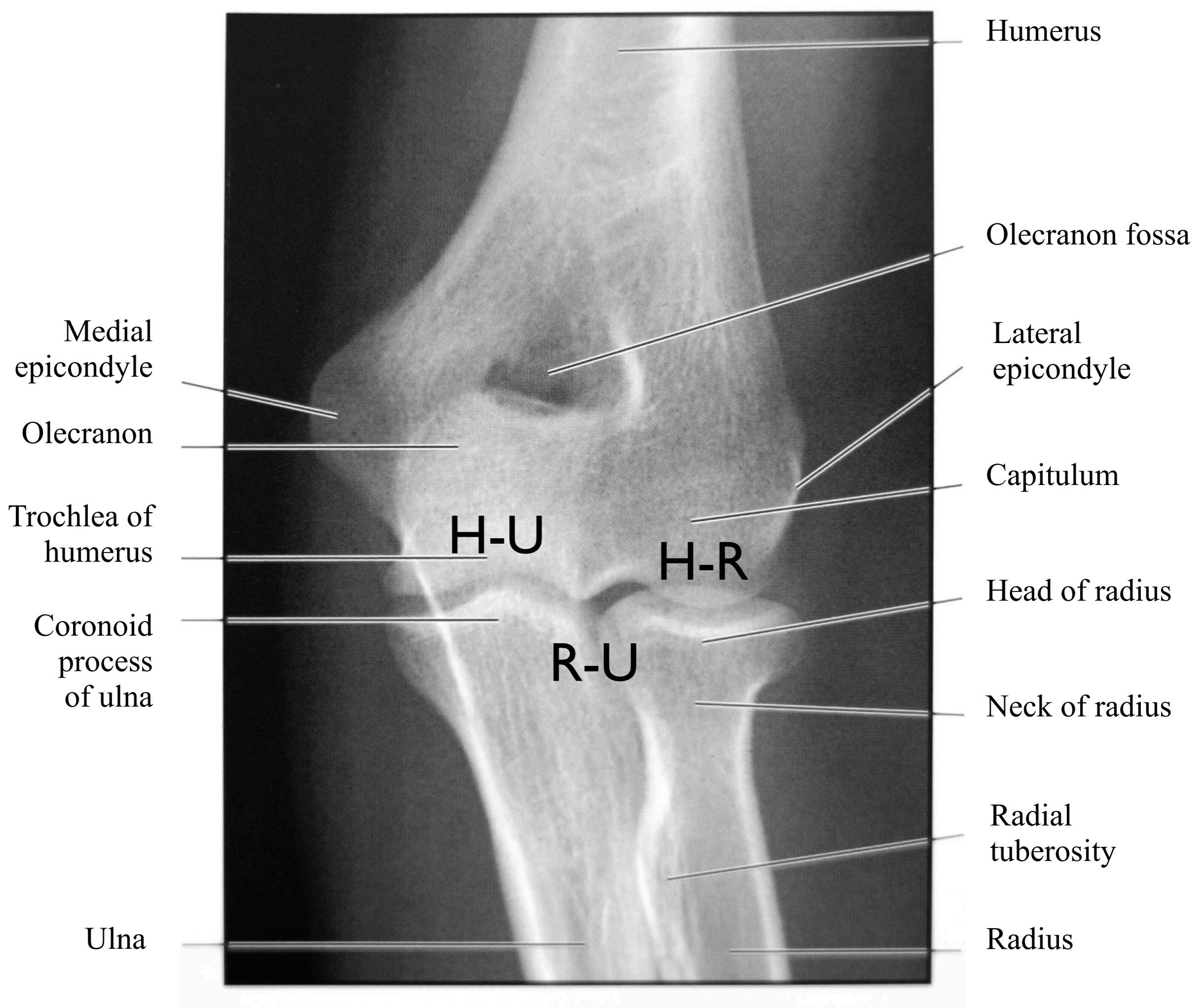
Albue

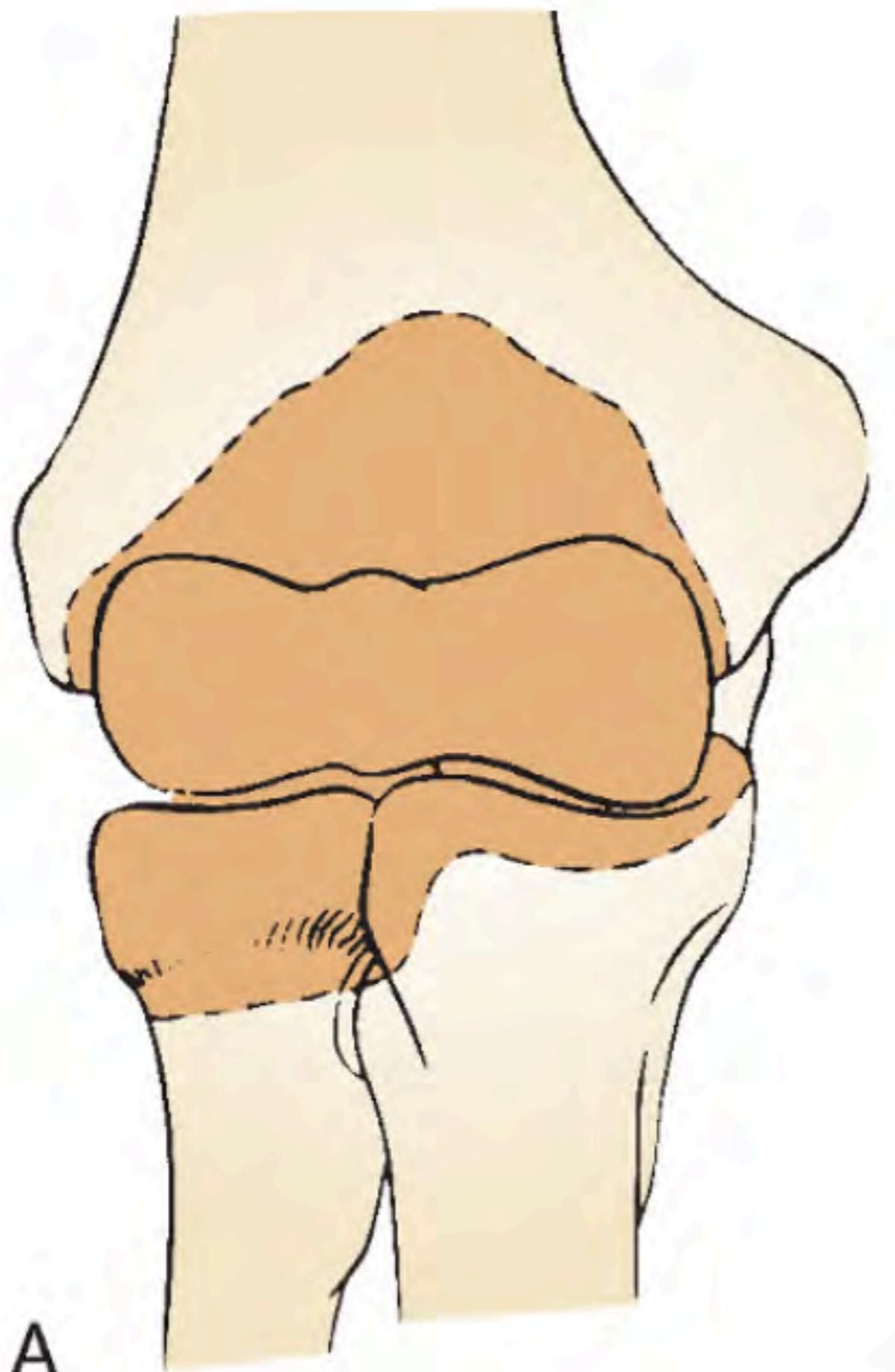
QR



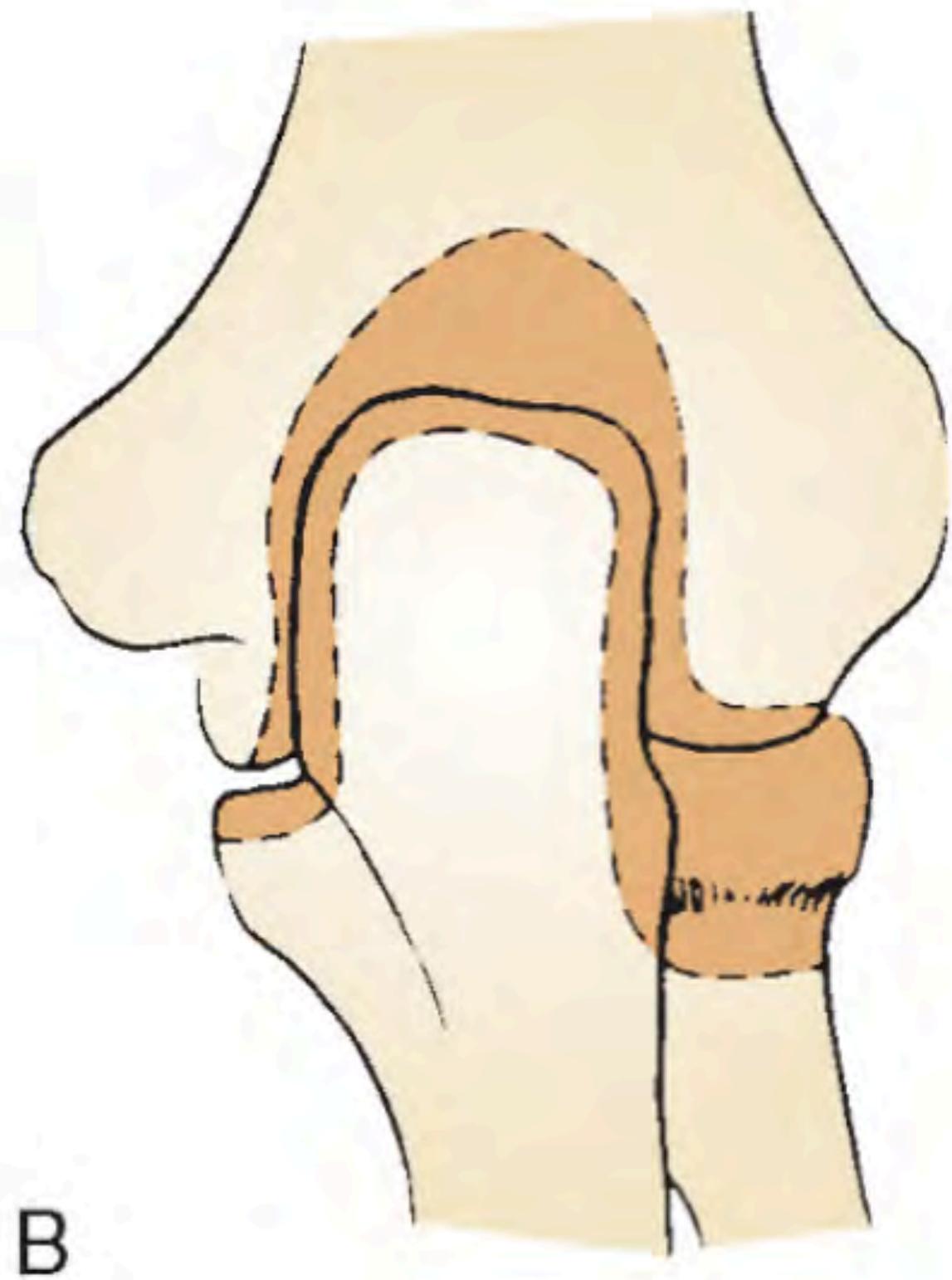
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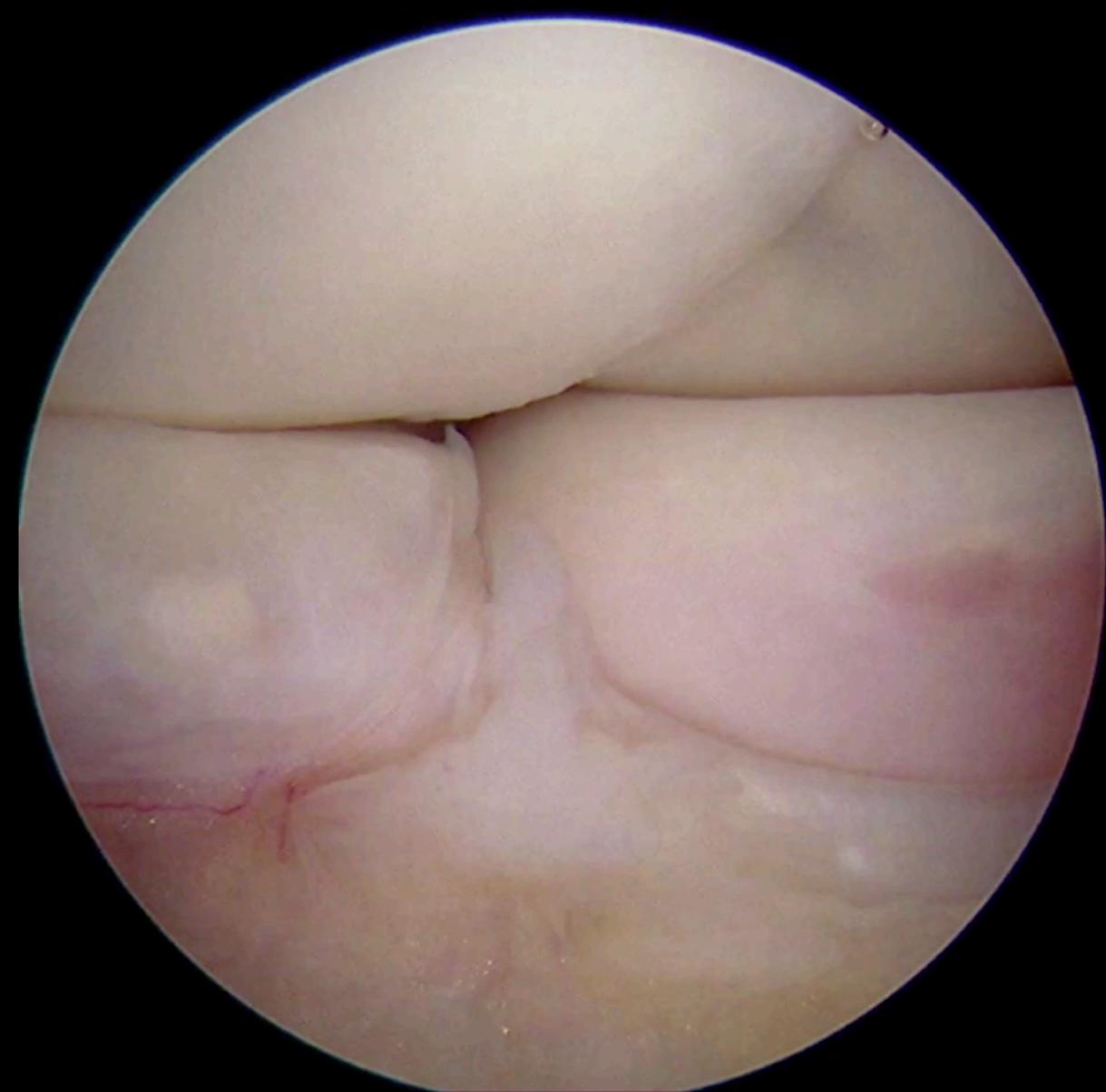
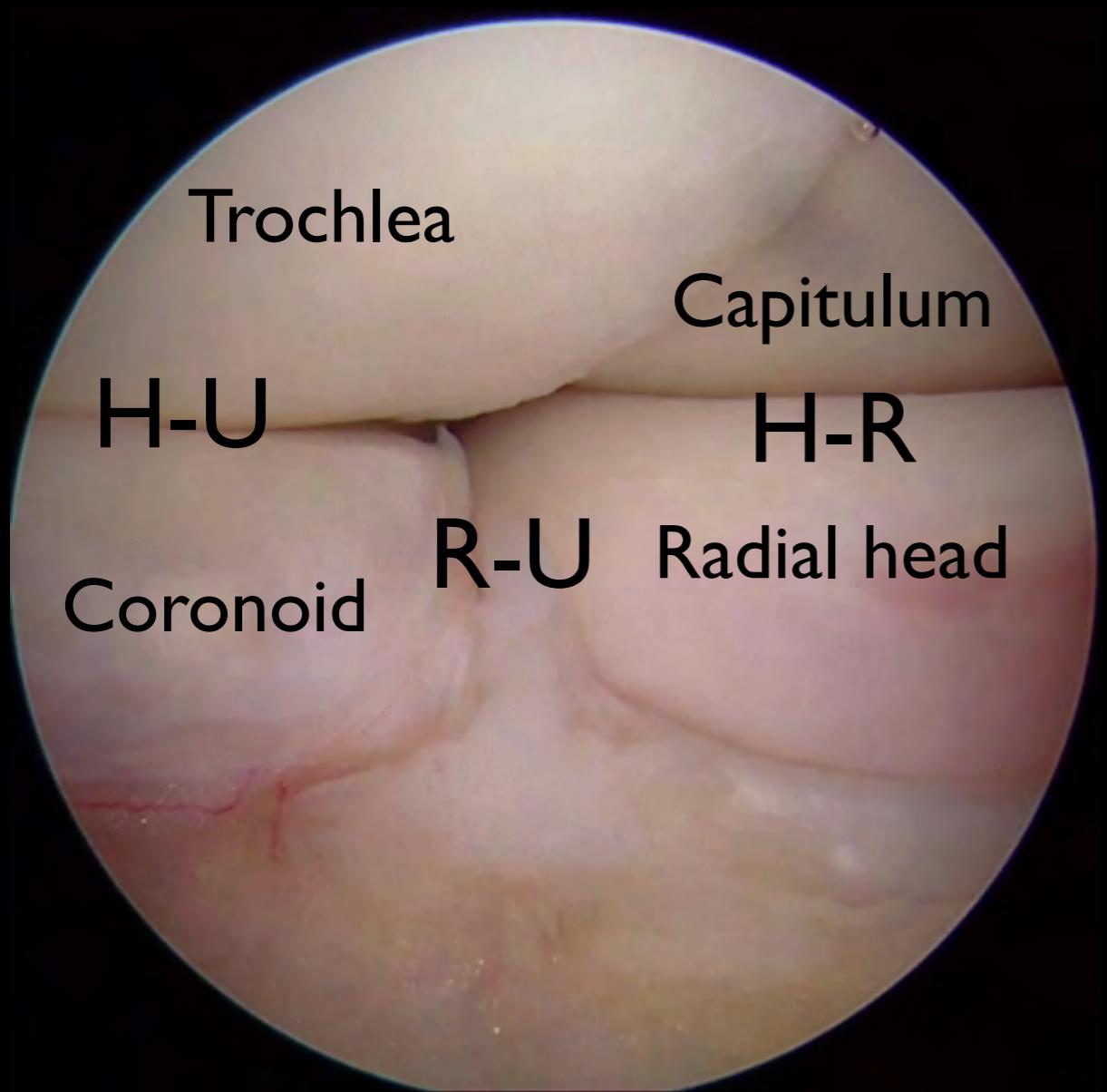


A

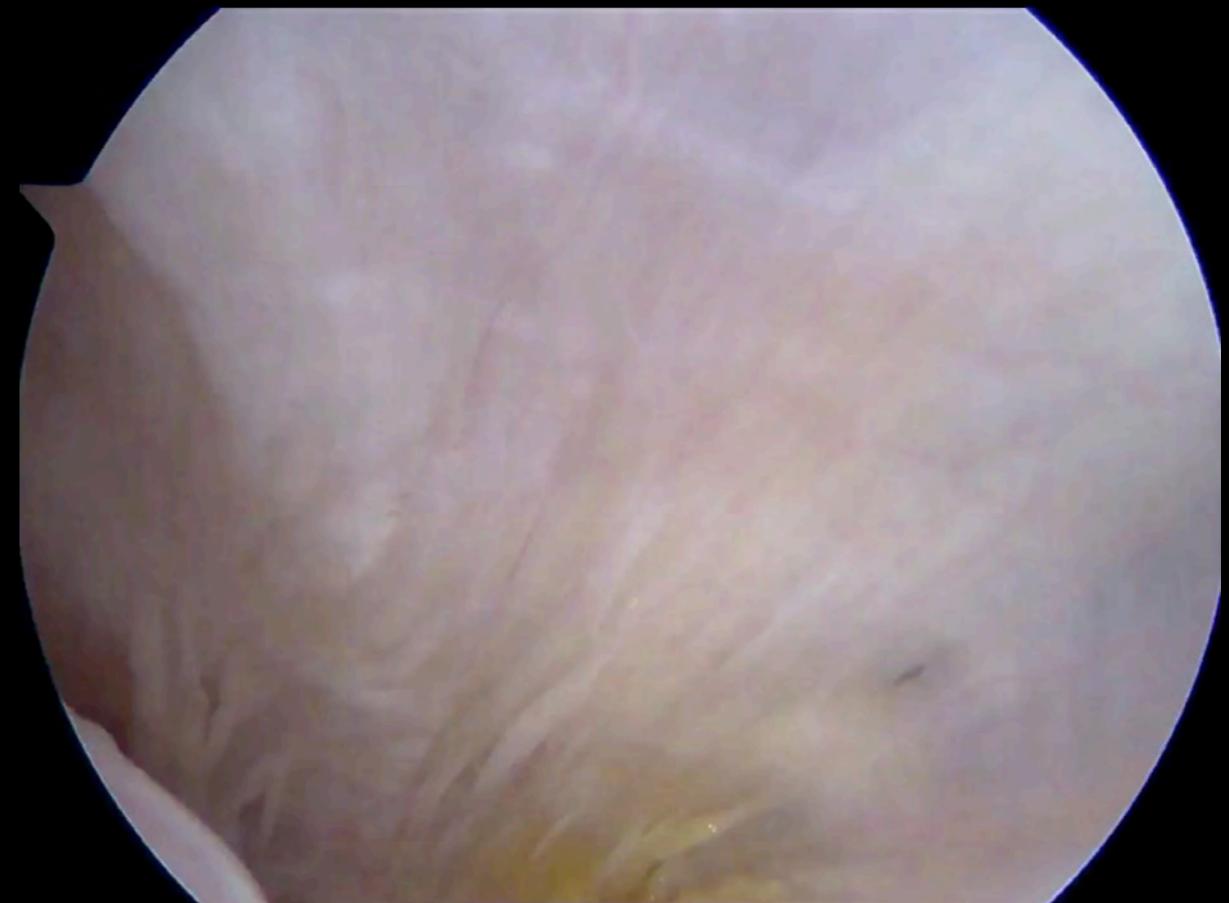
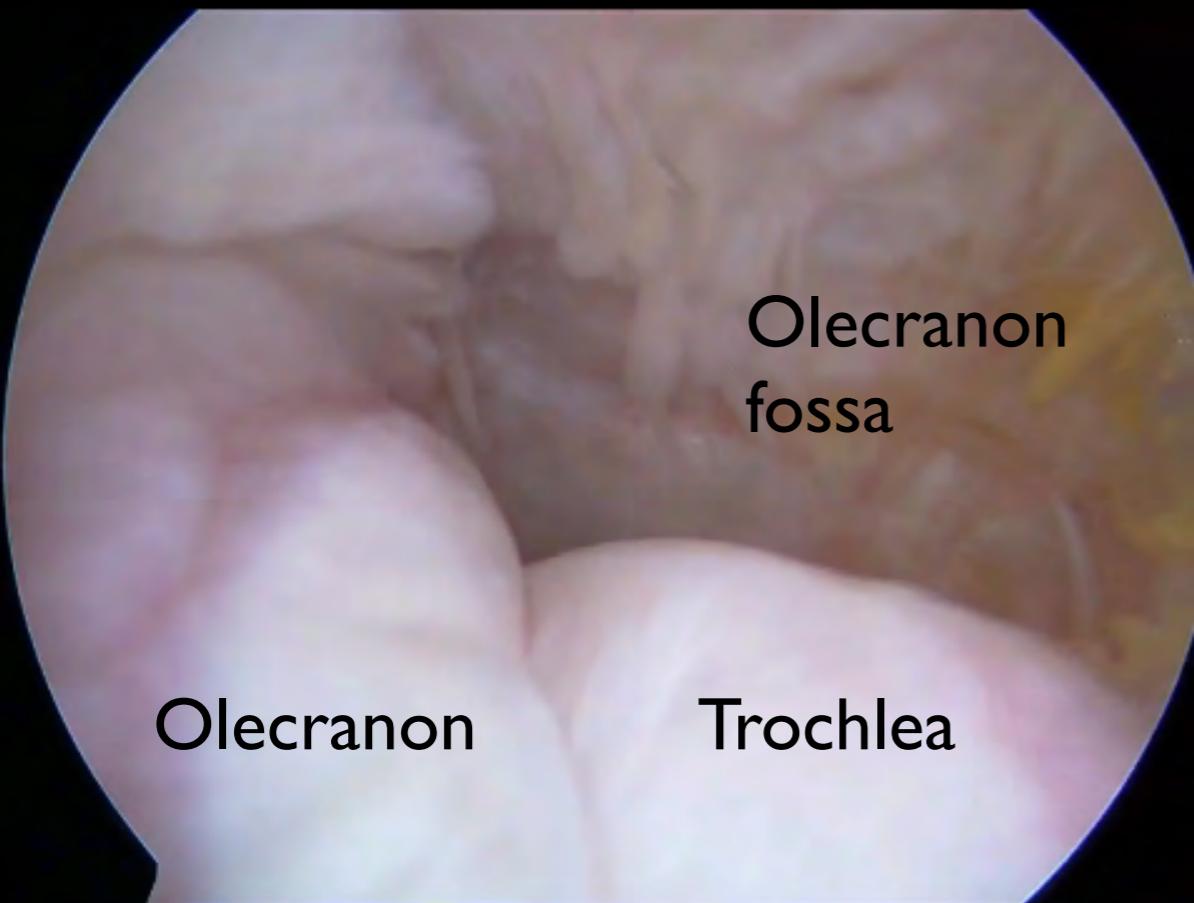


B

Anterior Compartment



Posterior Compartment



Undersøkelse

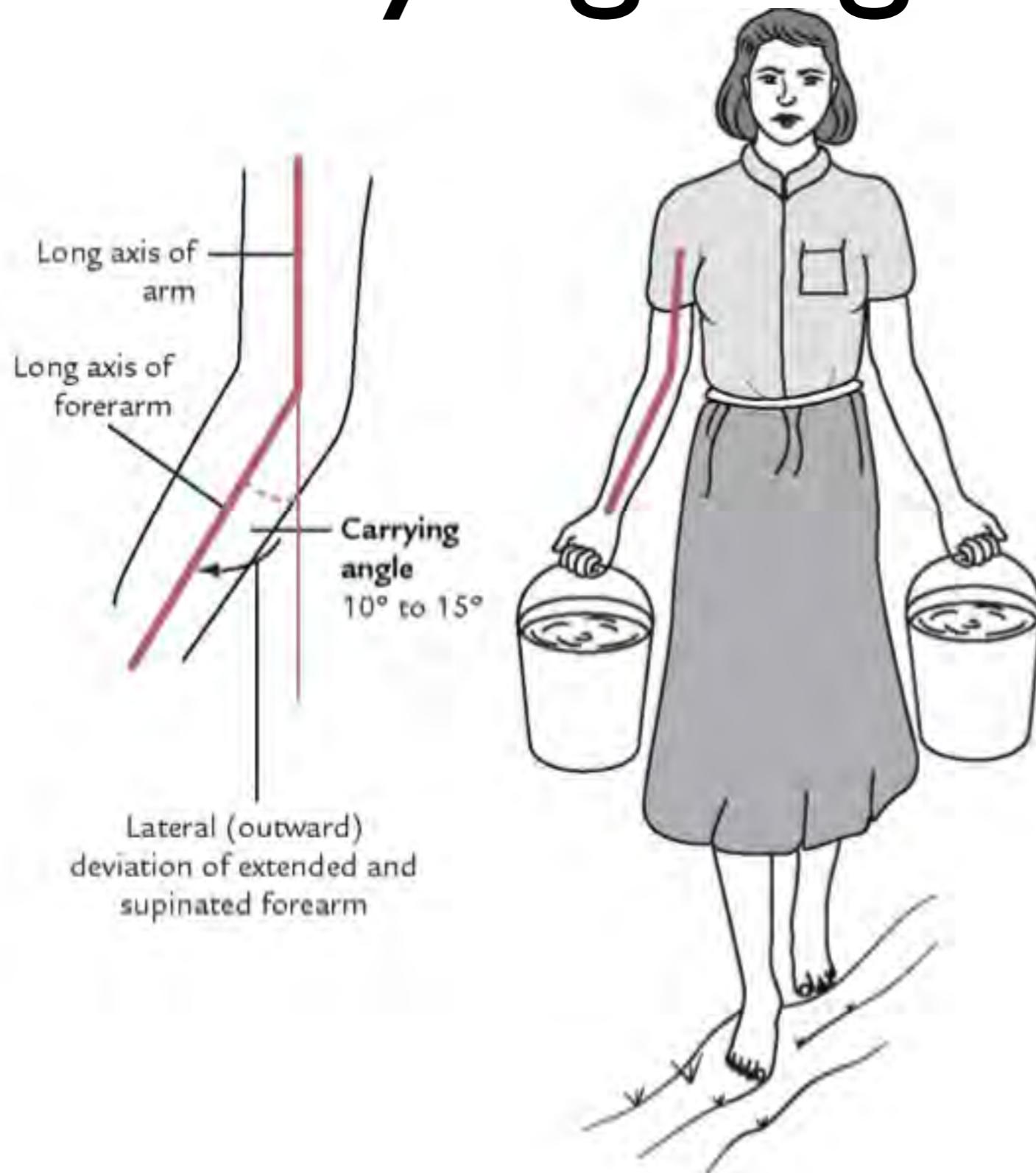
- Inspeksjon
- Palpasjon
- Funksjon
 - ROM, kraft, stabilitet
- Spesielle tester



Inspeksjon

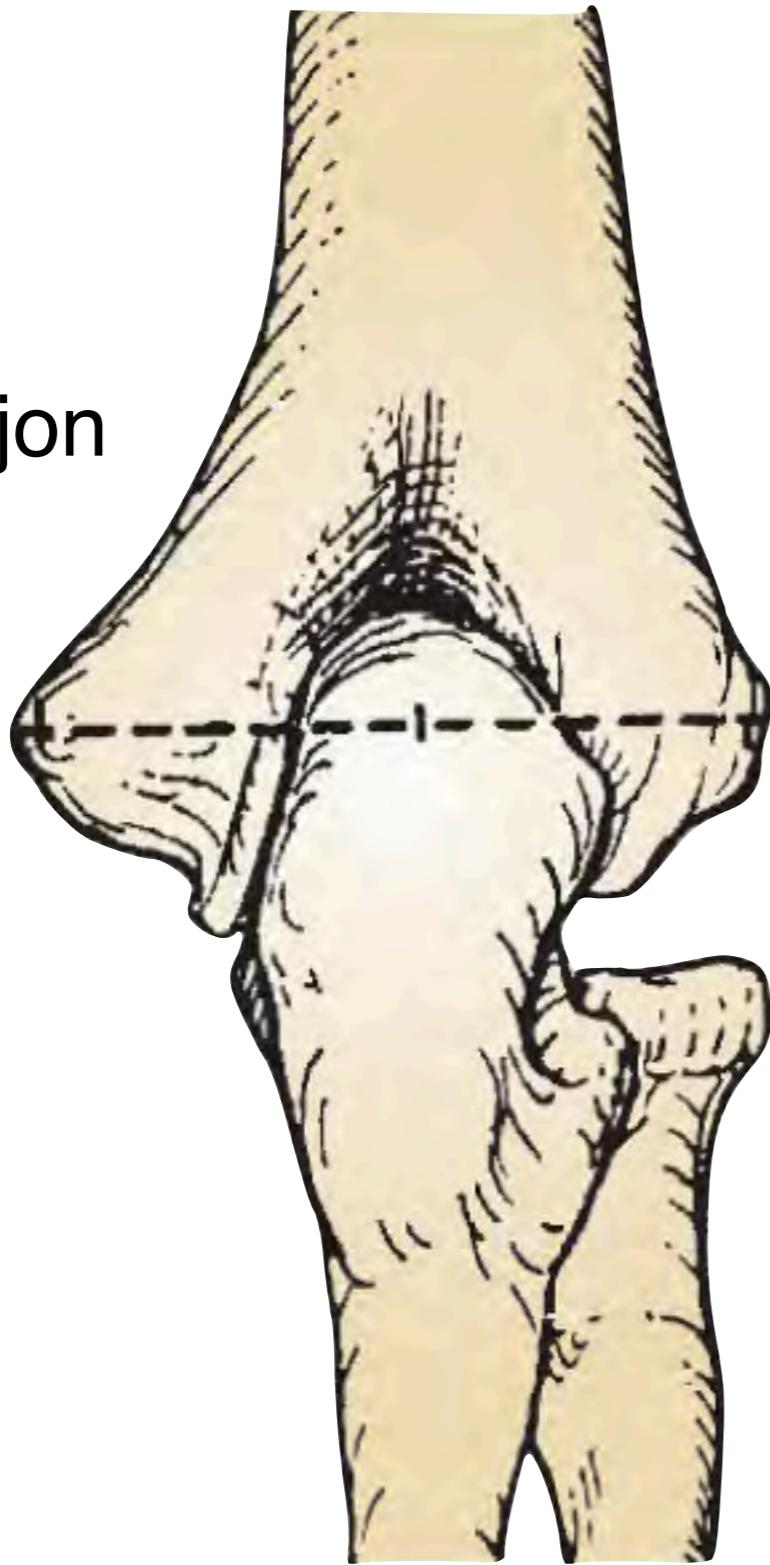
- Beinkonturer
 - Akser, Feilstilling, Deformasjon
- Bløtvevskonturer
 - Hevelse, Atrofi, Hypertrofi
- Hud
 - Rubor, Utslett, Arr (skade/kirurgi)

Carrying angle

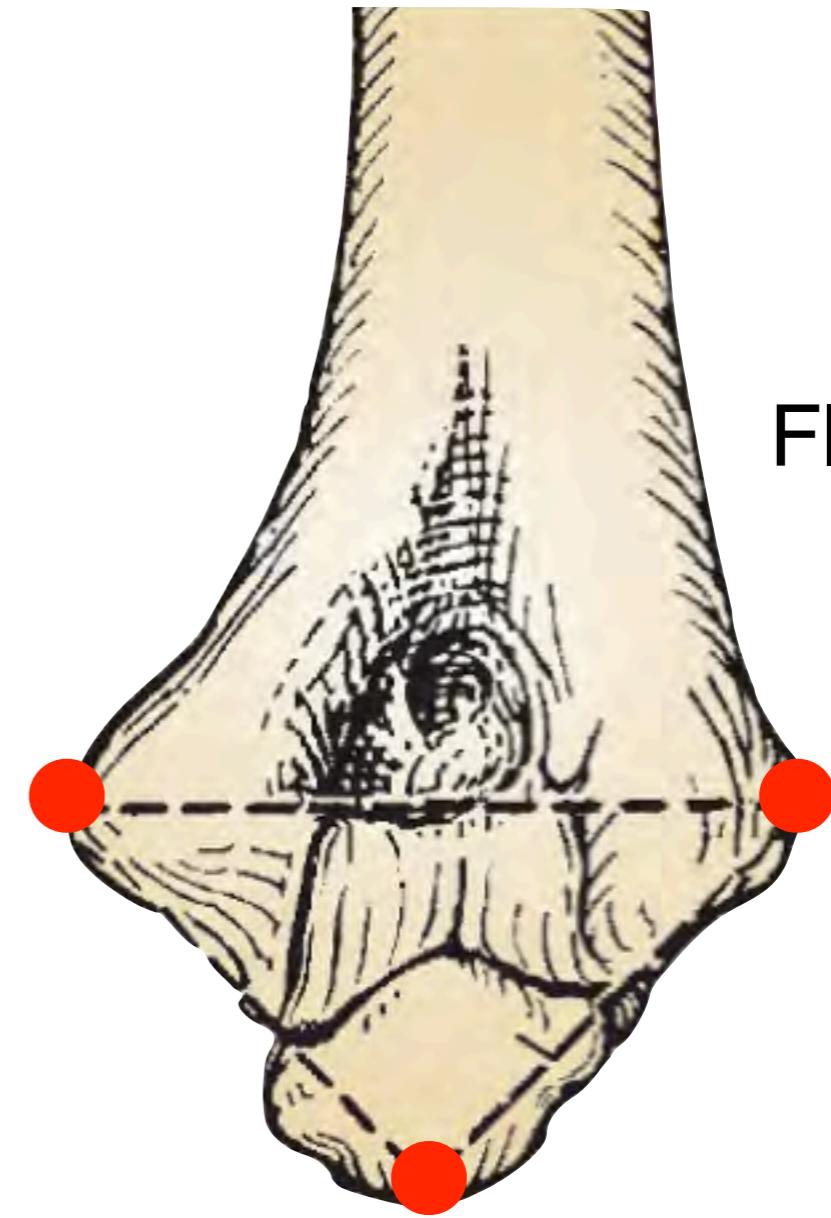


Beinete landemerker

Ekstensjon



Fleksjon

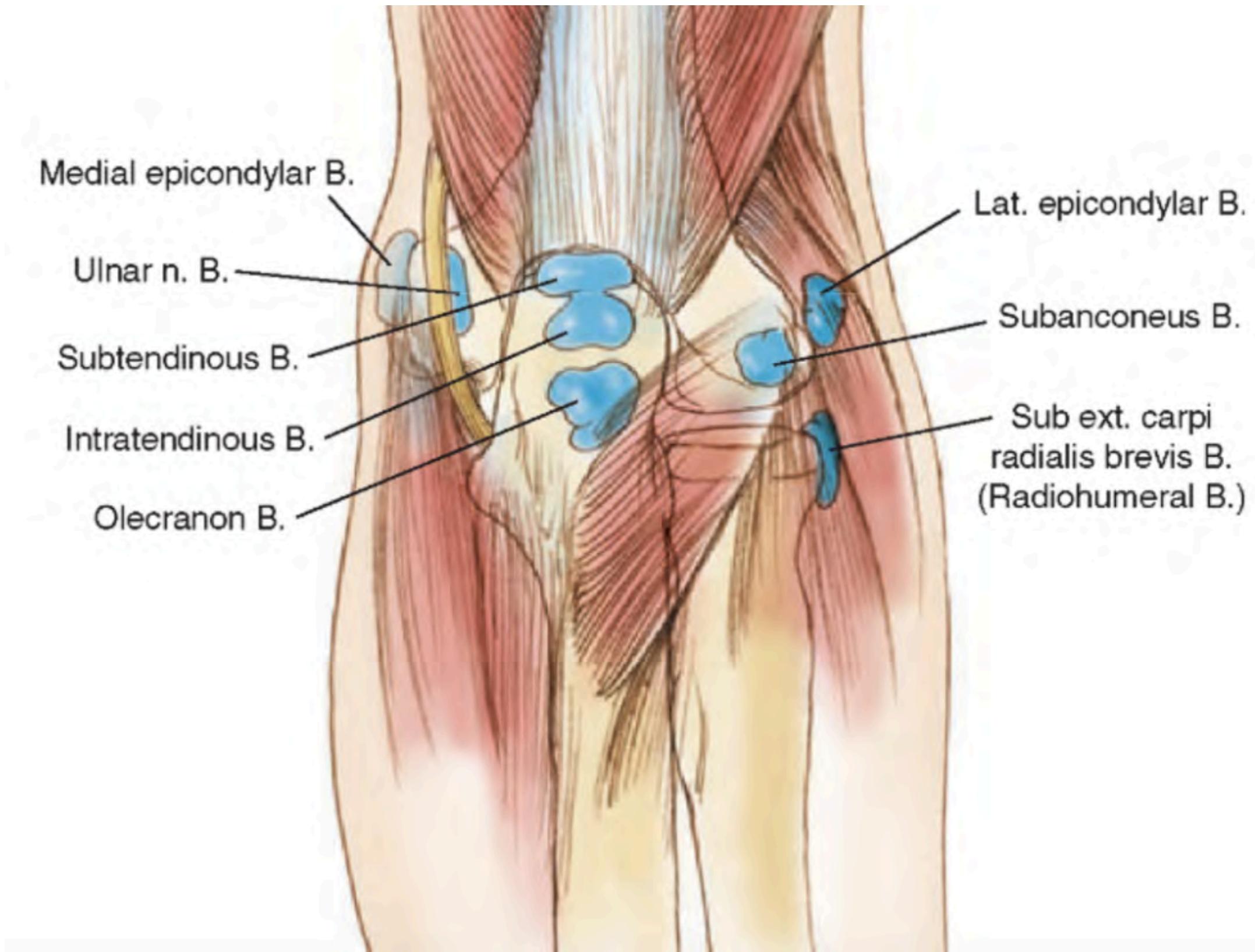




Luksert albue



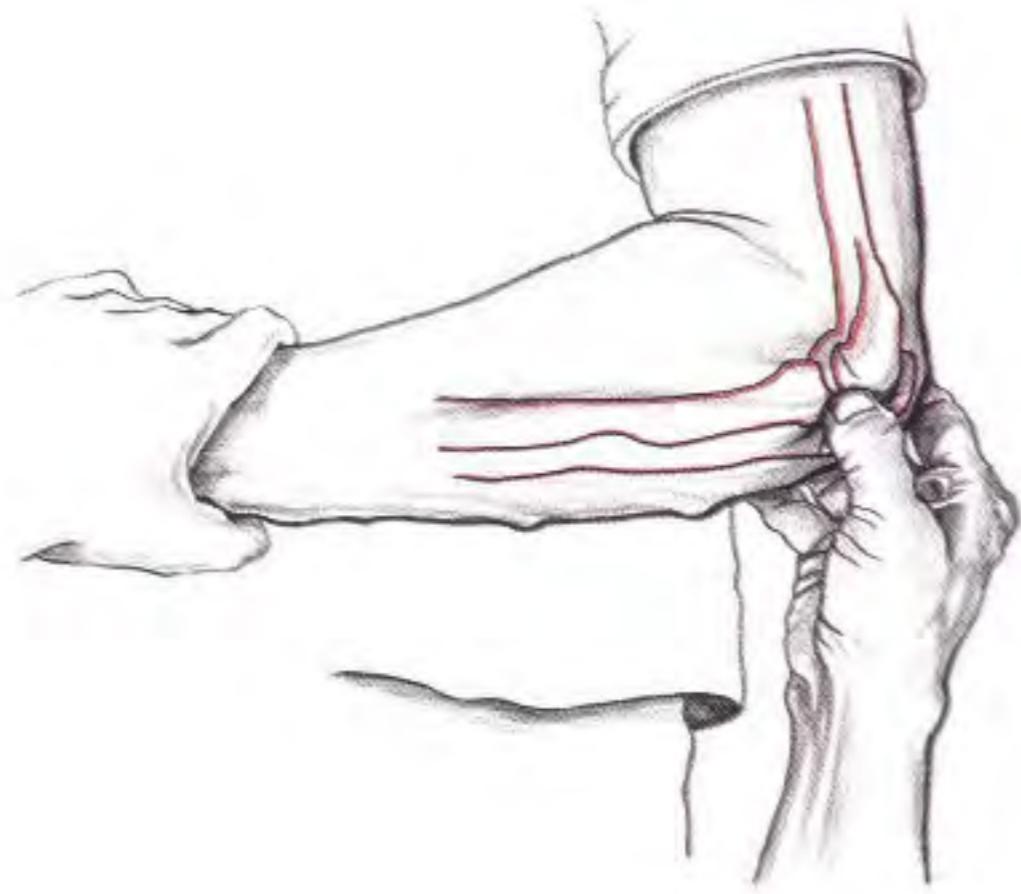




Palpasjon

- Hudtemperatur (inflam., sirk.)
- Ømhet (en finger) relatert til anatomi
- Hevelse/tumor
 - Størrelse, Overflate, Fasthet, Avgrensning
- Søkk
- "Distal status" (fraktur/luksasjon)
 - Arteriepuls, Sensibilitet

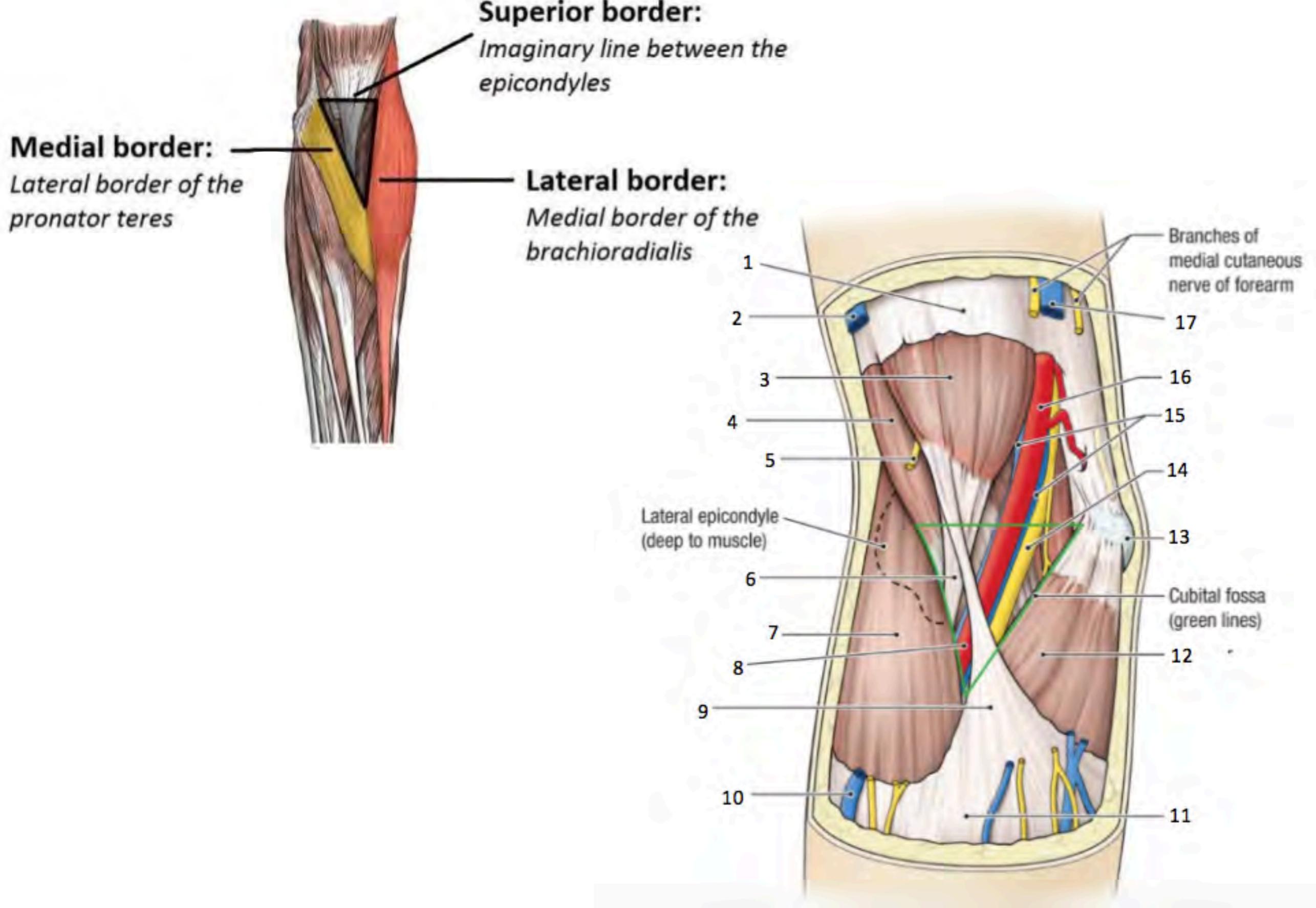
Økt intraartic. væske



Fluktuasjon i soft spot







Nerver

Nerver

Før en finger kan
over. Man kan kjø

- N. u
- N. n
- Vanskelig
- N. r
- supinator t

fingeren kan rulle

i. pronator teres.

to hodene av m.

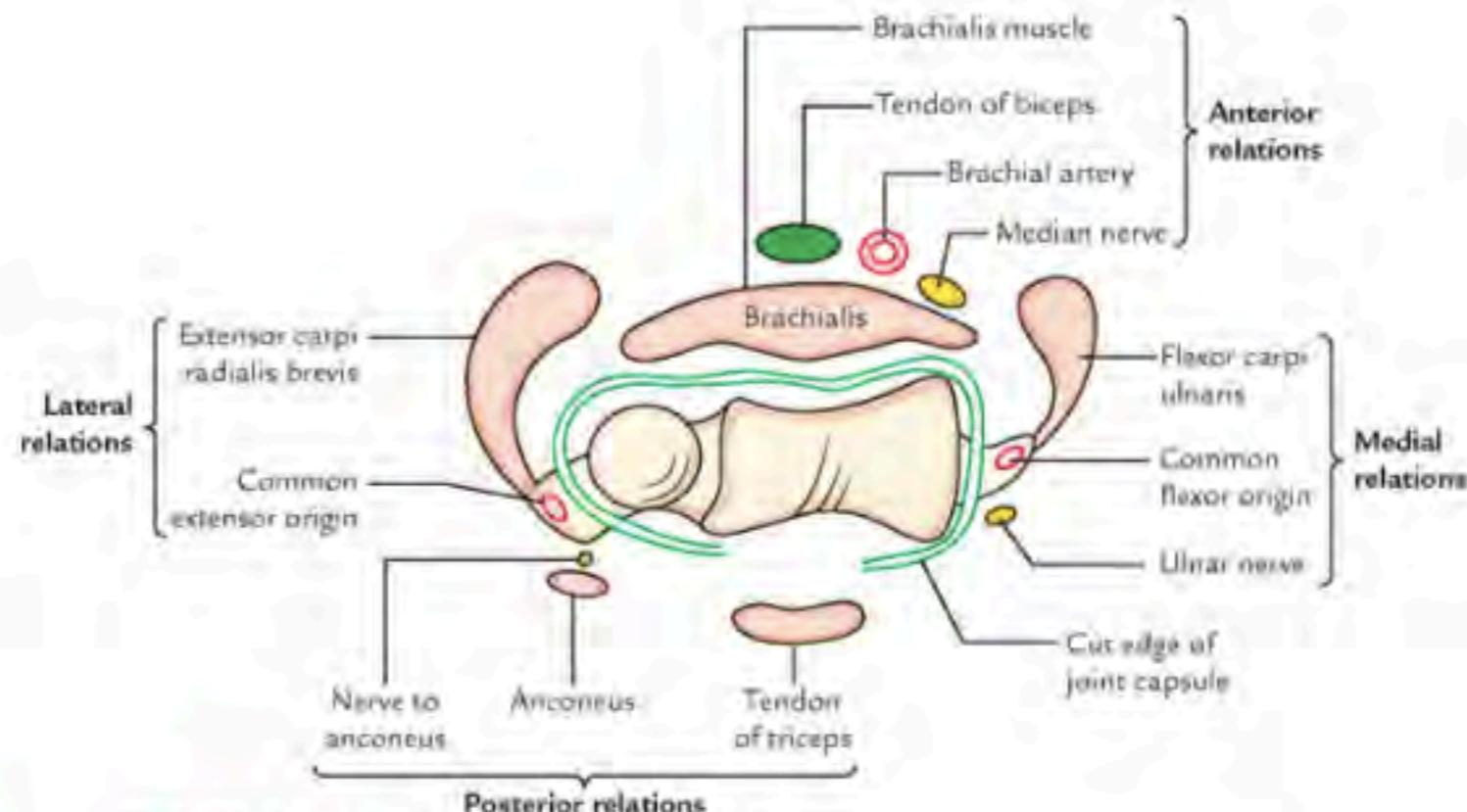


Fig. 10.6 Relations of the elbow joint.

Anterior:	(a) Brachialis muscle, (b) median nerve, (c) brachial artery, (d) tendon of biceps brachii. The last three structures are separated from joint capsule by brachialis.
Posterior:	(a) Tendon of triceps (b) anconeus.
Medially:	(a) Flexor carpi ulnaris, (b) ulnar nerve (posteromedially) (c) common flexor origin of the muscles of forearm (anteromedially).
Laterally:	(a) Spinator (b) common extensor origin of (posterolateral): muscles of forearm muscles, (c) extensor carpi radialis brevis.

Inneklemming

- Medianus
 - Pronator teres
- Ulnaris
 - Medale malleol
 - Fleksor carpi ulnaris
- Radialis
 - Supinator

Funksjon

- Bevegelsesutslag
 - Passivt, Aktivt
 - Smerteprovokasjon, Avvergreaksjon
 - Mekanisk hemming, Krepitasjon, Knepp
- Muskelkraft, Sensibilitet, Reflekser
- Stabilitet

Joint Motion

- Elbow flexion 0-145 degrees of flexion
 - Functionally can live with 30-130 degrees
- Pronation averages about 80 degrees
 - Functionally 50 degrees
- Supination averages about 85 degrees
 - Functionally 50 degrees

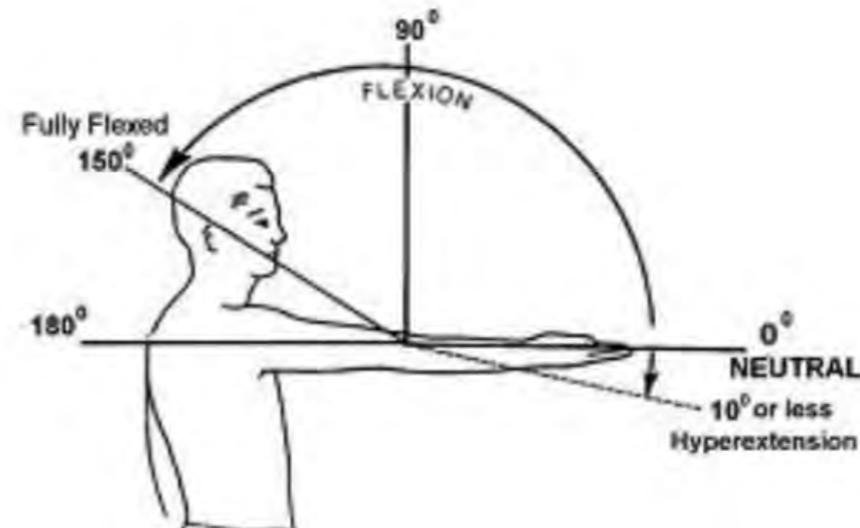
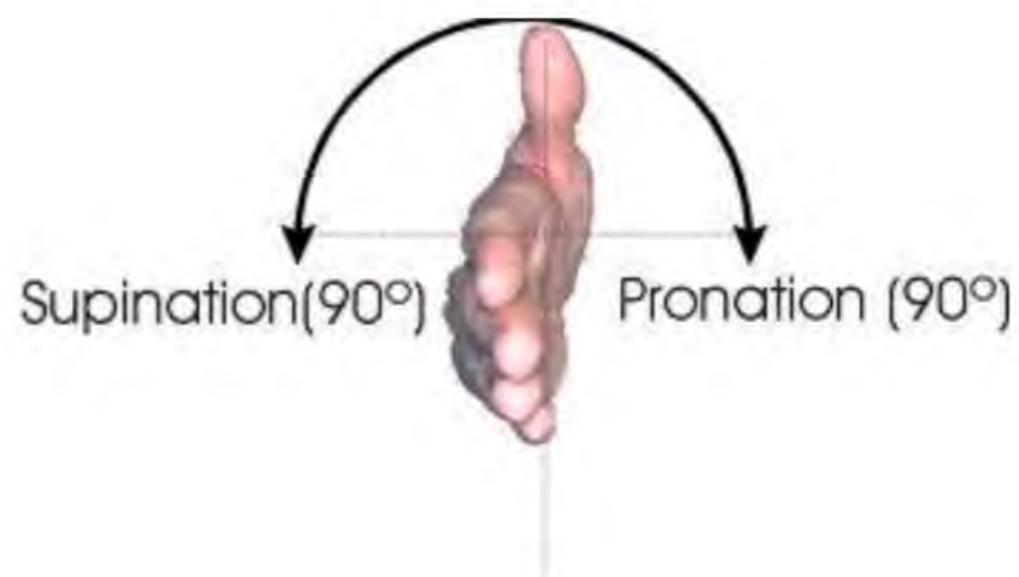
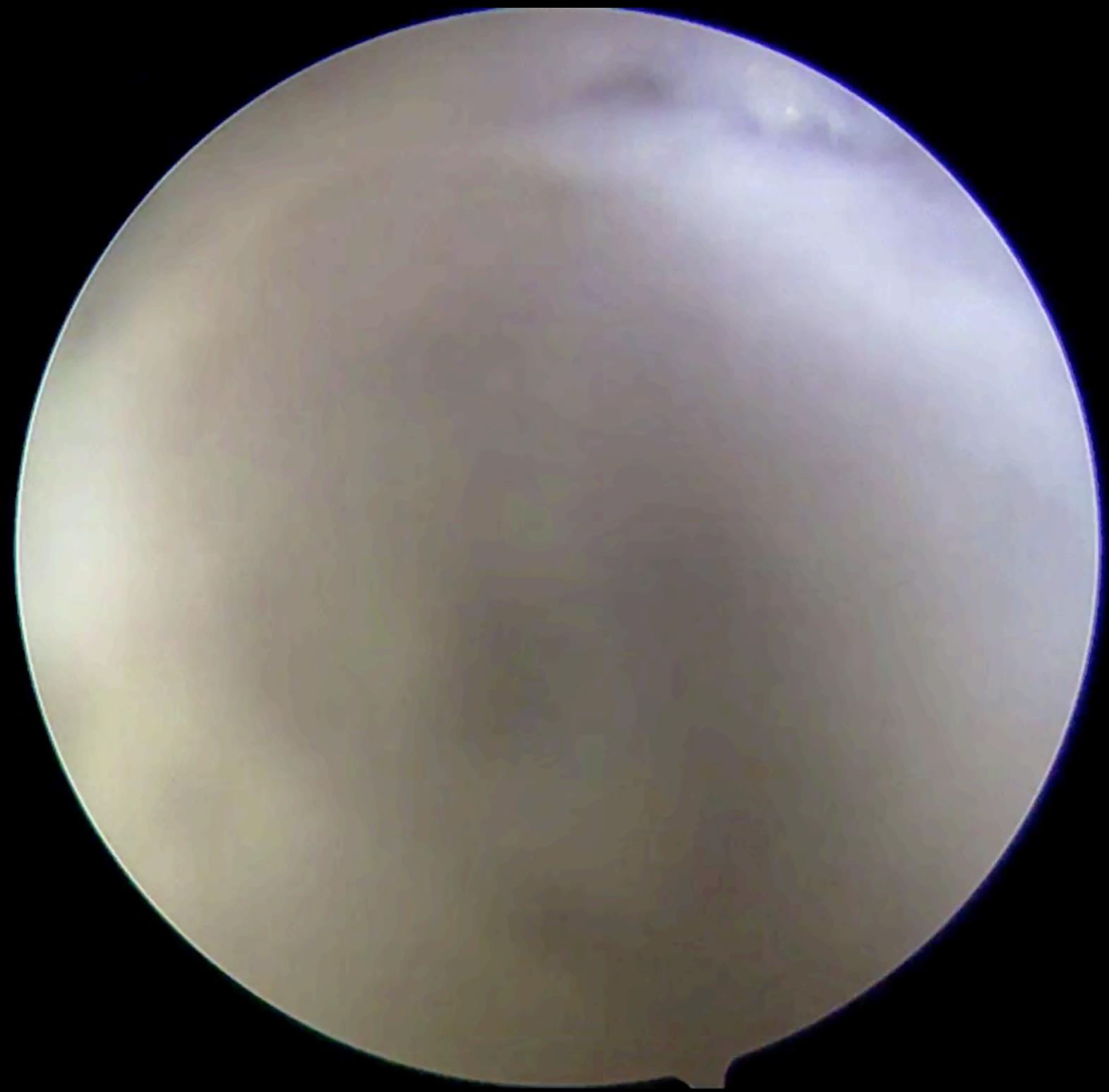


Figure 3. Range of motion at elbow joint
(Source: American Academy of Orthopaedic Surgeons)

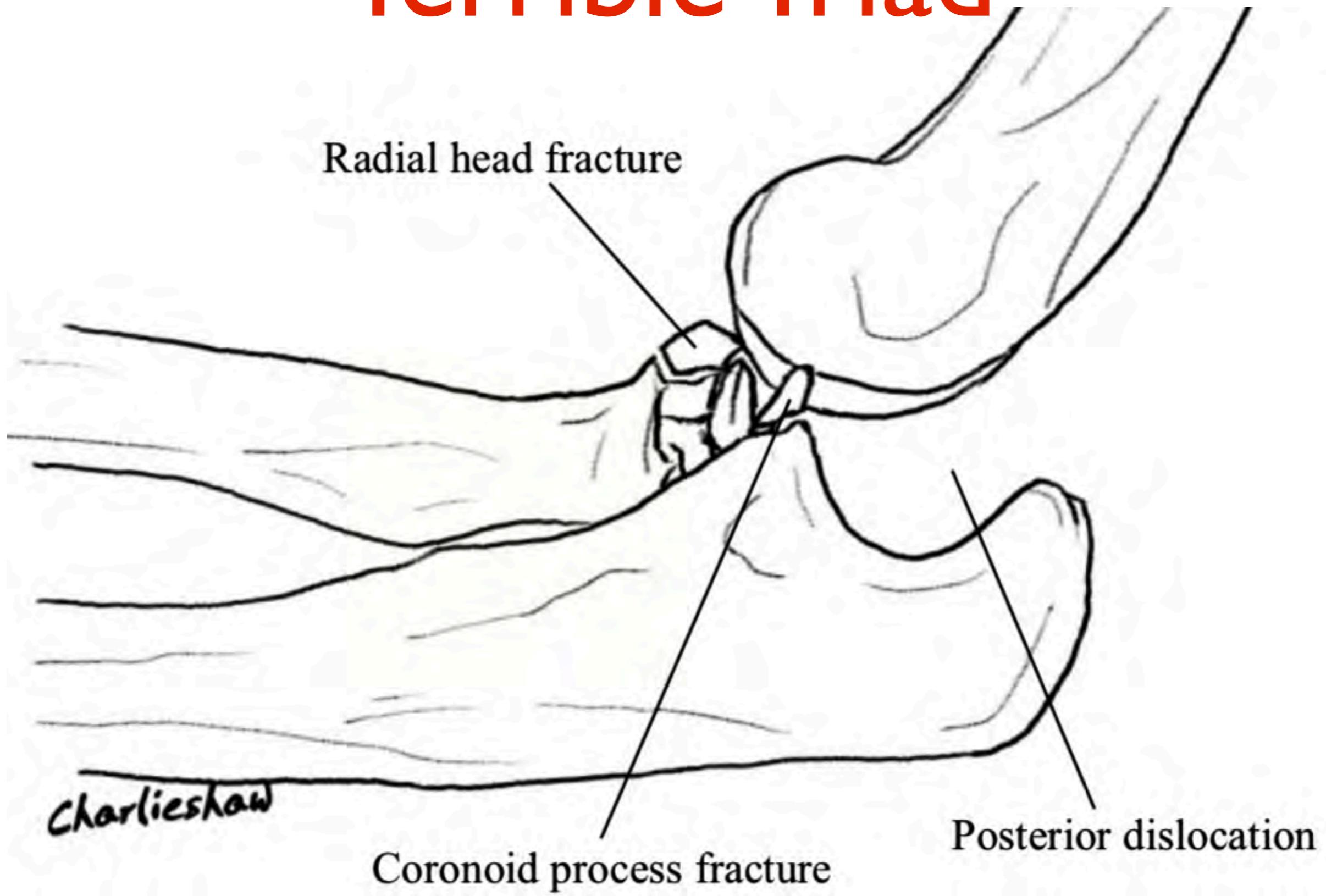


Undersøkelse av kraft



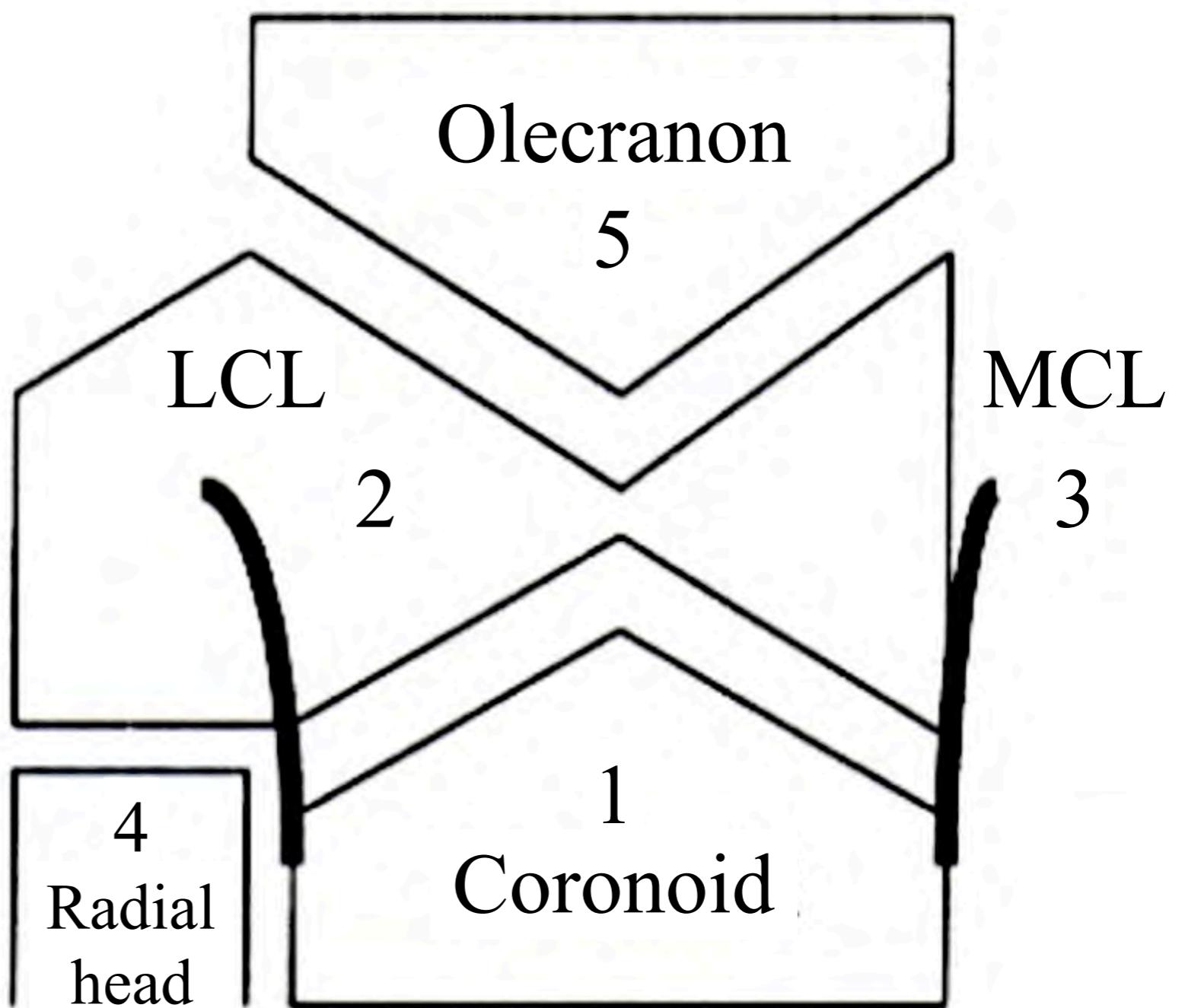


Terrible Triad

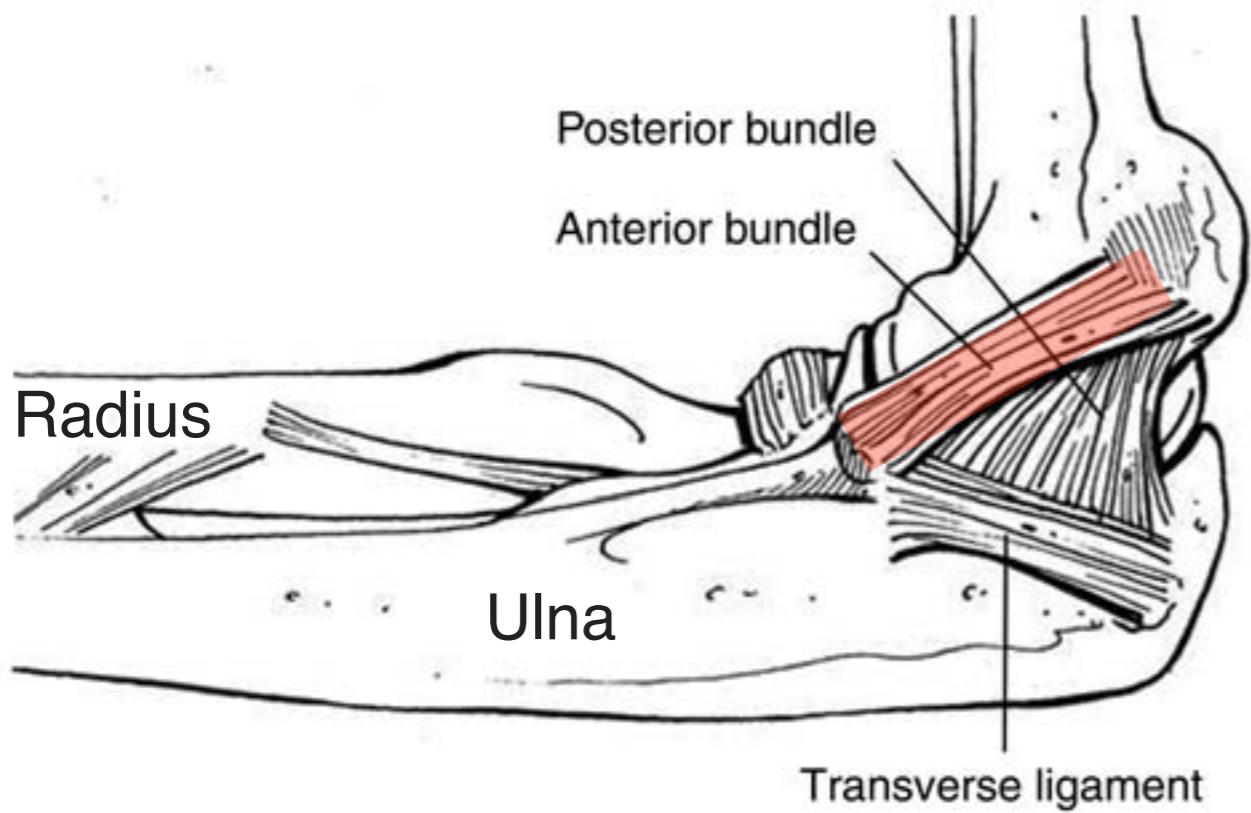


Stability Hierarchy

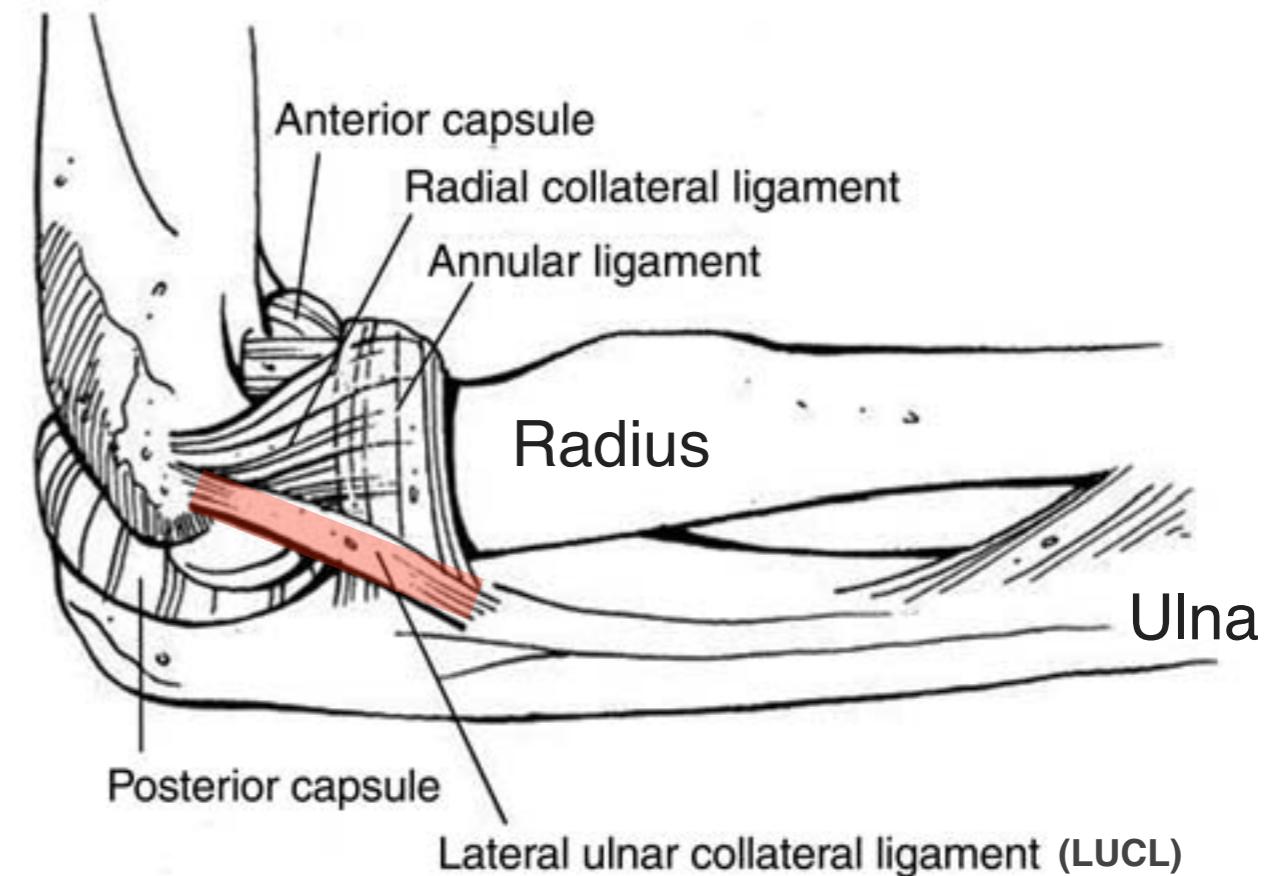
1. Coronoid
2. LCL (LUCL)
3. MCL
4. Radial head
5. Olecranon



MCL



LCL



Varus-valgus stabilitet



PLRI

Apply Gentle Posterolateral Force to Radius

PosteroLateral
Rotatory
Instability

Spesielle “tester”

- Biceps ruptur
- Triceps ruptur
- Bruskskade/OCD/frie legemer
- Olecranon bursitt
- Tennisalbue
- Inneklemming n. radialis
- Stiv albue

Ruptur distale biceps

- Redusert kraft i fleksjon, kan bedres med tiden.
- Hovedproblemet er redusert kraft i supinasjon og redusert gripeevne.
- Bloduttredelse distalt i huden.
- Kan palpere defekt i distale biceps ved kontraksjon.
- ”Skipper’n-muskel”. Muskelbuken er ”rullet” opp på overarmen.

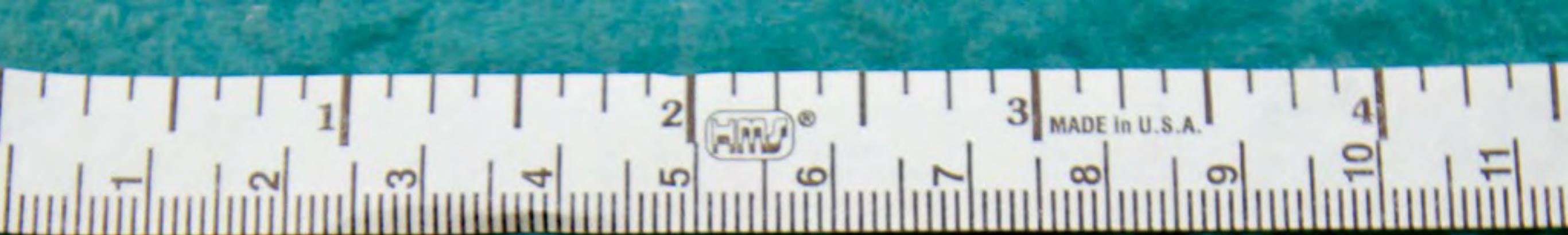
Triceps ruptur

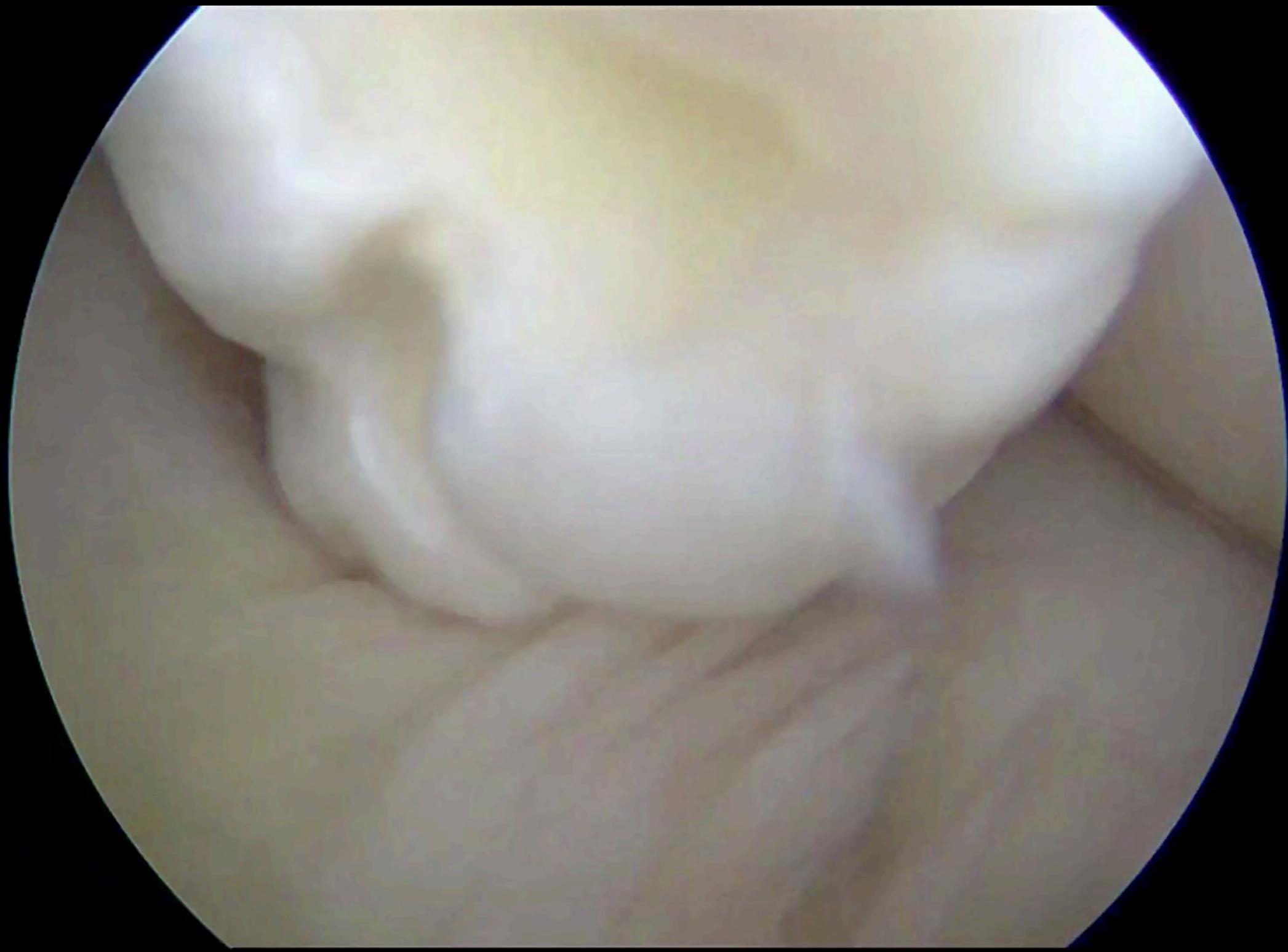
- Svekket ekstensjon
- Bloduttredelse og hevelse
- Palpabel defekt
- Thompson-test



Bruskskader/Fritt legeme

- Frakturer, luksasjoner, OCD (capitulum humeri, caput radii, synovial chondromatose)
- Smerter og låsninger i albuen
- Følelse av ”oppakninger” (forbigående) i ledet.
- Intermitterende smerte- og funksjonsproblemer i albuen
- Sekundære myalgier
- **Gnuretest: kompresjon, pro-/supinasjon, flex/ext**





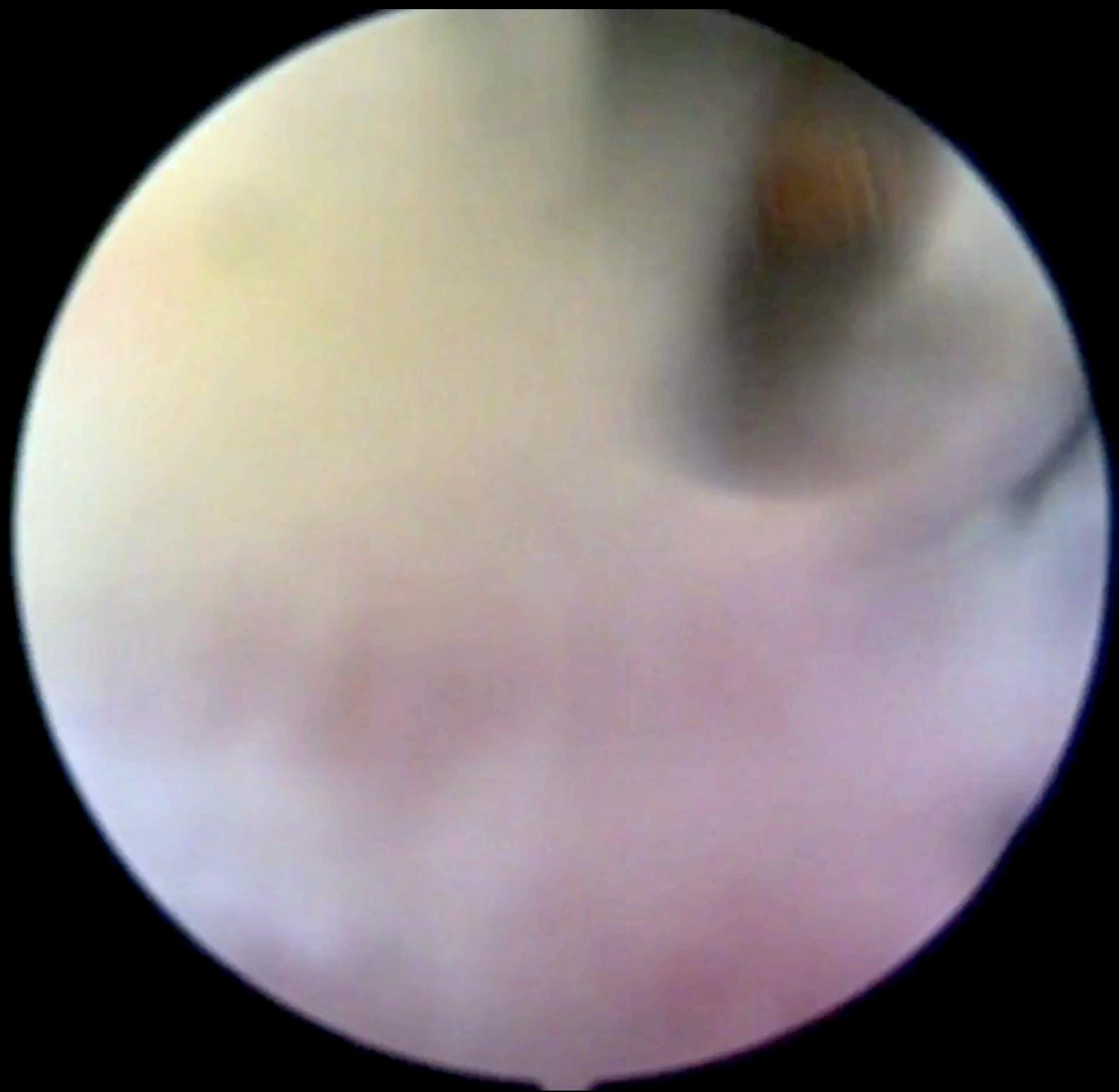


Olecranon bursitt

- Støt, slag, friksjon
- Akutt: Inflammasjon (hevelse, rubor, varme)
- Kronisk: Fortykket bursa med væske og fibrotiske knuter “riskorn”
 - Inspeksjon og palpasjon
 - Ultralyd US







Tennisalbue

- Overbelastning
- Microbrudd senefibre m. ext. carpi rad. brevis
- Manglende tilheling, innvekst kar & smertefibre
- Distinkt palp. ømhet foran lat. epicondyl
- Smerter ext. 2+3 finger mot motstand
- Smerter når løfter stolrygg
- Ultralyd US

HD



< : Skulder - E
< : L12-3
· MI 1,3
· TIS 0,3
·
· F5 Gn 50
< : 232dB/C3
· E / 2 / 2

Ultrasound examination
Longitudinal section over the
extensor tendons insertion in TE

T
P ▲ R
3,0 12,0 ▲

· 31Hz 3cm

Off
Size

HD

Ext. tendons

TP

Lat. epicondyle

Skulder - E
L12-3
MI 1,3
TIS 0,3
F5 Gn 50
232dB/C3
E/2/2

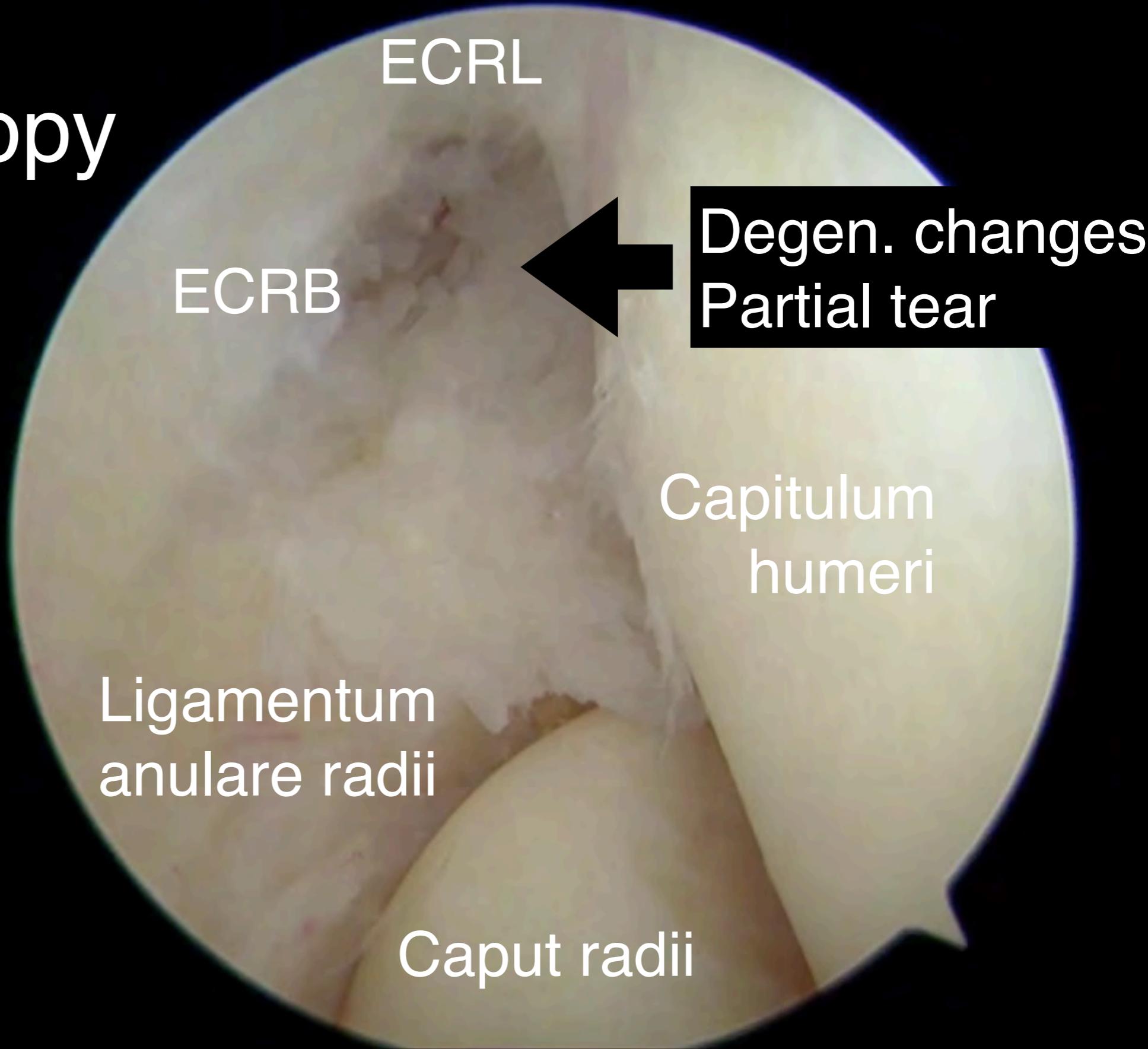
Ultrasound examination
Longitudinal section over the
extensor tendons insertion in TE

T
P R
3,0 12,0

31Hz 3cm

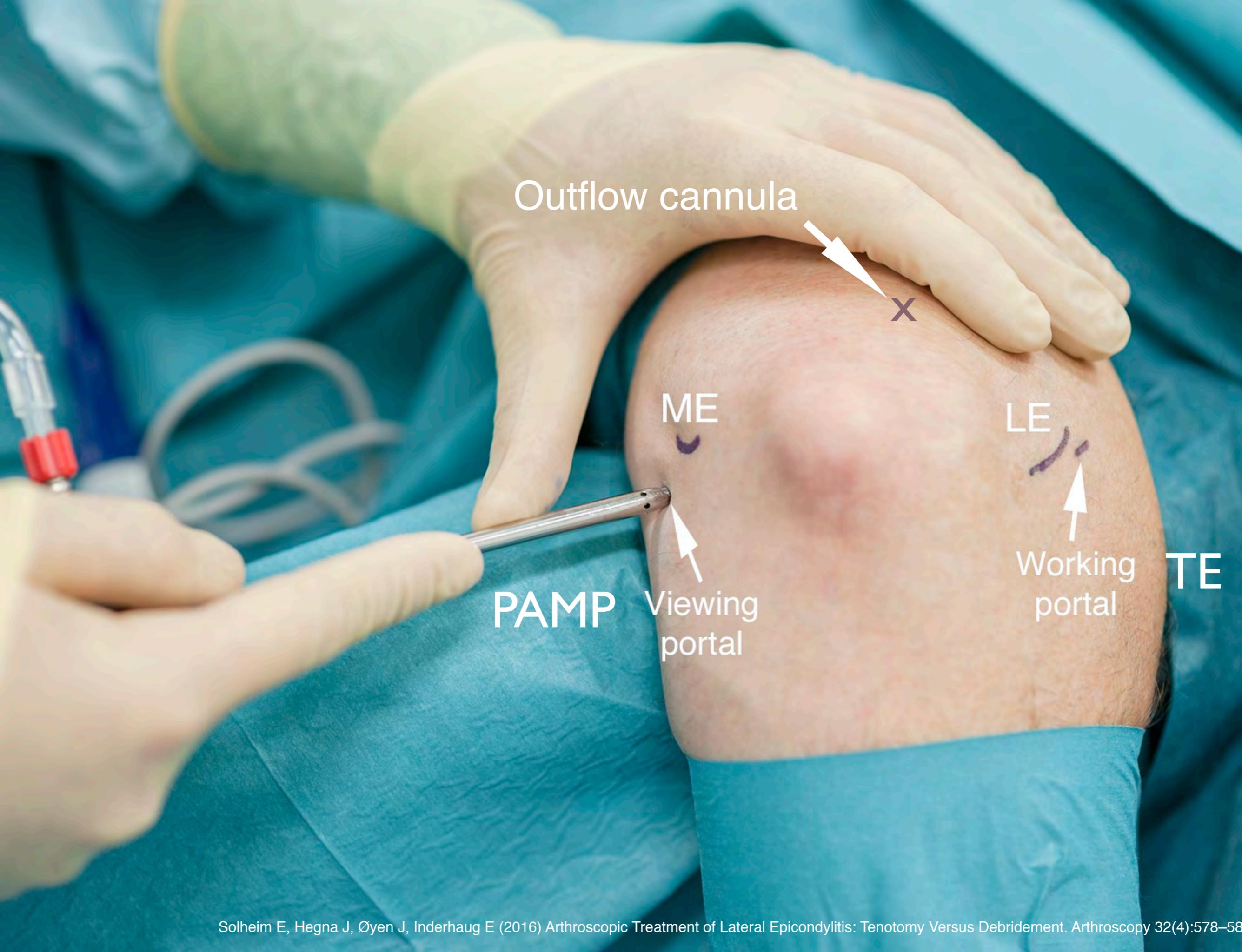
Off
Size

Arthroscopy
same
patient

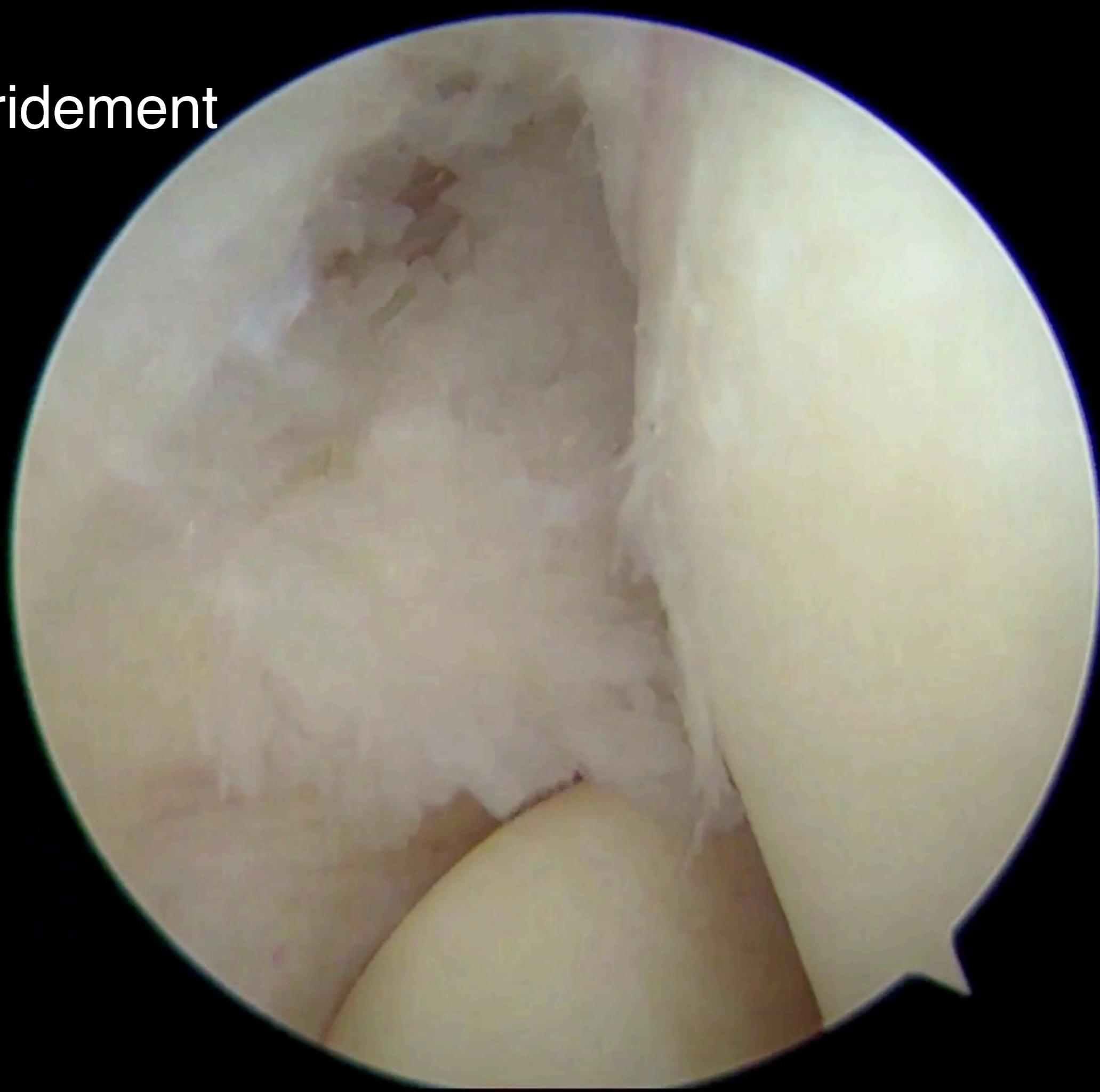


Indication surgery

- Pain and reduced function
 - Sick leave
- History > 6 months
 - (Mean 2 years in our studies)
- Failed rehabilitation
- Typical clinical findings
- Positive MRI and/or ultrasound findings



Debridement



Inneklemming n. radialis

- Laterale, verkende smerter, gjerne om natten, som stråler ned i underarmen og opp i overarmen.
- Svakhet i ekstensormuskulaturen.
- DD: tennisalbue
- Maksimal ømhet ligger i dypet av ekstensormuskulaturen 2 cm distalt og 2 cm medialt for laterale epikondyl.
- Økt smerte ved aktiv supinasjon mot motstand og ekstendert albue.

Stiv albue

- Sequele til luksasjon og/eller fractur
- Kontrakt, stiv og fortykket kapsel
 - Redusert fleksjon-ekstensjon
 - Kontant stopp
- Kan behandles ved kapsulotomi

