

## Disclosure

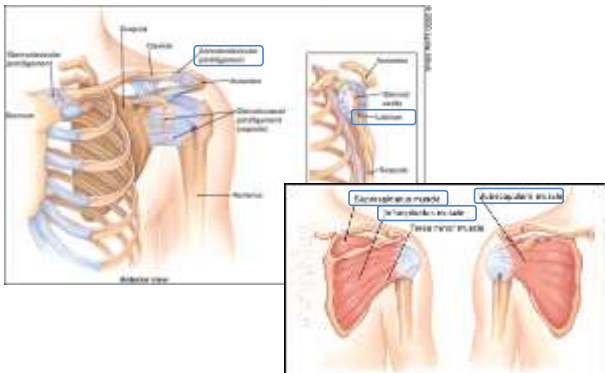
# Ultrasound Shoulder Anatomy + Approach to Musculocutaneous and Suprascapular Nerves (In 20mins)

17<sup>th</sup> August 2019  
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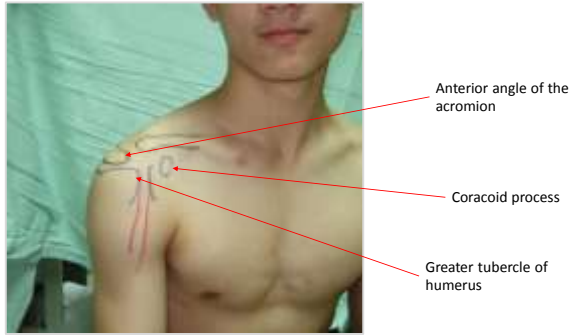
- Thanks to our sponsors



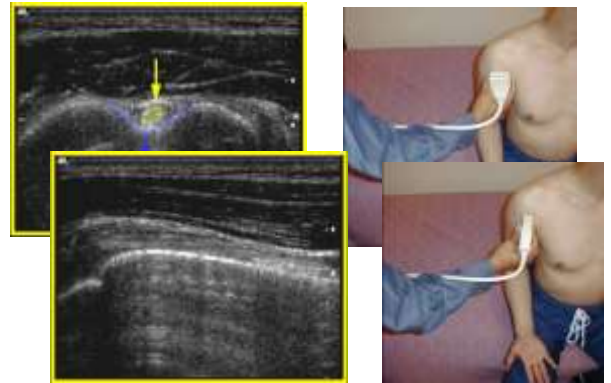
## 1. Bones and Ligaments



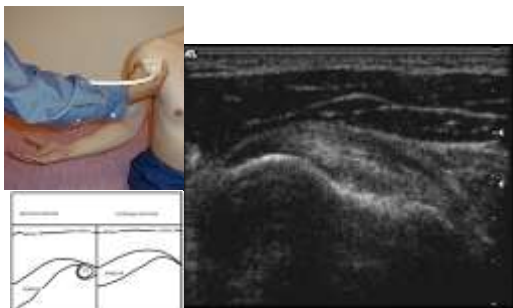
## Surface Landmarking



## Biceps brachii(long head)



## Subscapularis Muscle



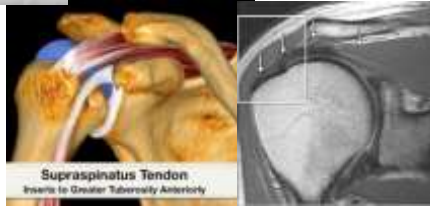
## AC joint





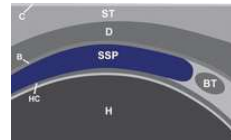
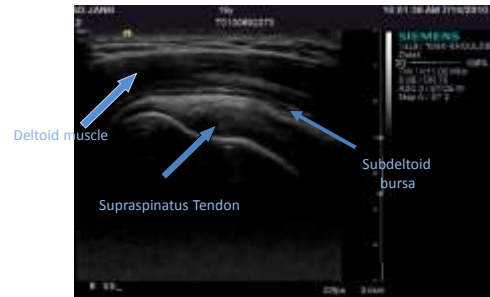
**Supraspinatus- Modified Cross position**

"Put your hand in your back pocket"  
"Elbow in"



**Supraspinatus**

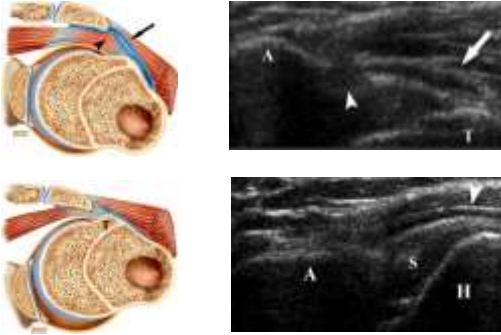
- Longitudinal axis "Bird's beak view"



Transverse View



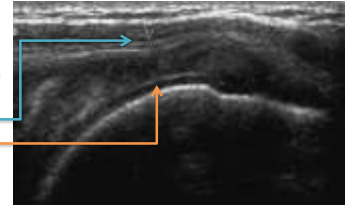
Dynamic Impingement test



AJR 2006; 187:216-220 13

• Rotator cuff tears : Abnormalities seen in two imaging planes

- Direct signs include
  - Nonvisualization of the cuff – massive tear
  - Hypoechoic/anechoic zone separating the tendon edges
  - Flattening of the superficial border of the tendon
  - Naked tuberosity- absence of the normal tendon, replaced by a thin hypoechoic line representing the hypertrophic bursa surrounding the greater tuberosity
  - Compression test
- Indirect signs
  - Effusion
    - biceps tendon, subD bursa
  - greater tuberosity erosions
  - Deltoid herniation
  - Cartilage interface sign
  - Muscle atrophy



Approach to the Musculocutaneous and Suprascapular Nerves

General Advice for Imaging Nerves

- Know the anatomy of the region
- “Lift” Method: following the course of the nerve

- Mnemonic **PART**
  - Pressure** : Compress underlying subcutaneous adipose tissues.
  - Alignment**: Placing the transducer in a position over the extremity at which the underlying nerve is expected to be seen.
  - Rotation**: allows fine-tuning of the view of the target structure.
  - Tilting**: bring the face of the probe perpendicular to the underlying structure and thus provide the best image



## General Advice for Chemodenervation

- Carefully select patients- failed other means of treatment; not psychological pain
- Suggested injectate: 1ml 50% dehydrated alcohol +1ml 1% preservative-free lignocaine (Approx equivalent to 2% phenol block)
- Complications: Pain during injection, chronic dysesthesia and chronic pain; local or regional vascular complications by vessel toxicity

D'Souza RS, Warner NS. Phenol Nerve Block. [Updated 2019 Jul 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK525978/>

## Musculocutaneous Nerve

- **Nerve roots** – C5, C6, C7.
- **Motor functions** – muscles in the anterior compartment of the arm (coracobrachialis, biceps brachii and the brachialis).
- **Sensory functions** – gives rise to the lateral cutaneous nerve of forearm, which innervates the lateral aspect of the forearm

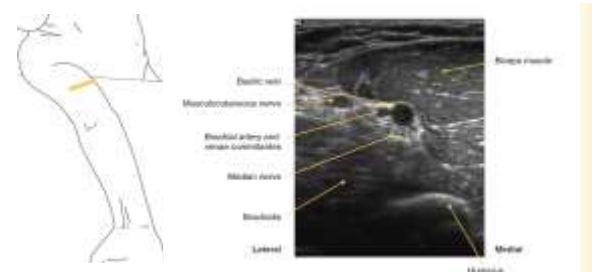


The **musculocutaneous nerve** is the terminal branch of the lateral cord of the brachial plexus (C5, C6 and C7) and emerges at the inferior border of pectoralis minor muscle.

It leaves the axilla and pierces the **coracobrachialis** muscle near its point of insertion on the humerus.

The musculocutaneous nerve then passes down the flexor compartment of the upper arm, between the **brachialis & biceps brachii** muscles.

It continues into the forearm as the lateral cutaneous nerve and provides sensory innervation to the lateral aspect of the forearm.



Coracobrachialis

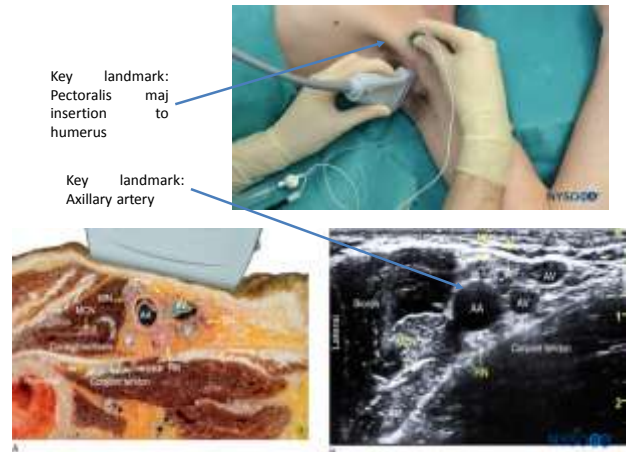
- Origin: tip of coracoid process.
- Insertion: mid-medial humerus.

M Bradley, P O'Donnell. *Atlas of musculoskeletal ultrasound anatomy*. Greenwich Medical Media, 2003.

## Musculoskeletal nerve block

Indicated for

- Severe elbow spasticity



## Suprascapular nerve

### Suprascapular Nerve

- Suprascapular nerve is derived from the upper trunk of brachial plexus C5 and C6.
- It is a mixed nerve containing both sensory and motor fibers.
- sensory branches to both the glenohumeral and acromioclavicular joints.
- It passes downward, laterally deep to the **omohyoid** and trapezius muscles & then posteriorly to run under trapezius along with the suprascapular vein and artery, it reaches the suprascapular notch.
- Thereafter, it provides motor innervation to the suprascapular muscle and after passing the spinoglenoid notch, the infraspinatus.

## Suprascapular nerve block

Indicated for

- Post stroke shoulder pain not relieved by other medications
- Severe proximal shoulder spasticity

## Suprascapular nerve block

- 2 main approaches-
- Proximal block (Omohyoid)
- Suprascapular notch block (much easier)

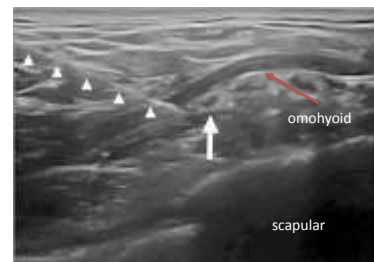
Gracies JM, Elovic E, McGuire J, Simpson DM. *Traditional pharmacological treatments for spasticity. Part I: Local treatments.* Muscle Nerve Suppl. 1997;6:S61-91. Review. PMID: 9826983

Siegenthaler A, Moriggl B, Mlekusch S, Schliessbach J, Haug M, Curatolo M, Eichenberger U. *Ultrasound-guided suprascapular nerve block, description of a novel supraclavicular approach.* Reg Anesth Pain Med. 2012 May-Jun;37(3):325-8. doi: 10.1097/AAP.0b013e3182409168. PubMed PMID: 22222688.



Anatomic relation between the suprascapular nerve and the inferior belly of the omohyoid muscle at the supraclavicular fossa and placement of the probe (black bars; probe; arrows; needle). (A) Surface anatomy. The medial marking indicates jugular notch and lateral marking indicates mid shaft of the clavicle. (B) The probe is placed just above the distal clavicle to identify the suprascapular nerve passing beneath the inferior belly of the omohyoid muscle

Ko, Kwang-Pyo et al. *The Proximal Approach in an Ultrasound-Guided Suprascapular Nerve Block.* Journal of the Korean Orthopaedic Association(2017), 52 (6):521  
<http://dx.doi.org/10.4055/jkoa.2017.52.6.521>



- A 25-gauge needle is inserted from the lateral side of the probe with an 'in-plane' technique until the needle tip reached the suprascapular nerve (arrow).

## Suprascapular notch approach

- The suprascapular notch at the superior border of the scapula, just medial to the base of the coracoid process.
- Transverse scapular ligament covers the notch.
- The suprascapular nerve passes below the transverse scapular ligament whereas scapular artery is above the ligament.



“Meier Approach” to suprascapular nerve block: outer 1/3 of spine of scapular, 2cm superior, 2cm medial.



Meier G, Bauerleis C, Maurer H. [The modified technique of continuous suprascapular nerve block. A safe technique in the treatment of shoulder pain]. *Anaesthesist*. 2002 Sep;51(9):747-53. German. PubMed PMID: 12232647.

## Summary

1. Revise the anatomy and recognize surrounding structures prior to injection
2. Use “Lift” method to trace course of nerves and identify them.
3. Give chemodenervation medications cautiously, in small boluses.