The Axillary Nerve

The Musculocutaneous Nerve

The Radial Nerve

The Median Nerve

The Ulnar Nerve

Other Nerves

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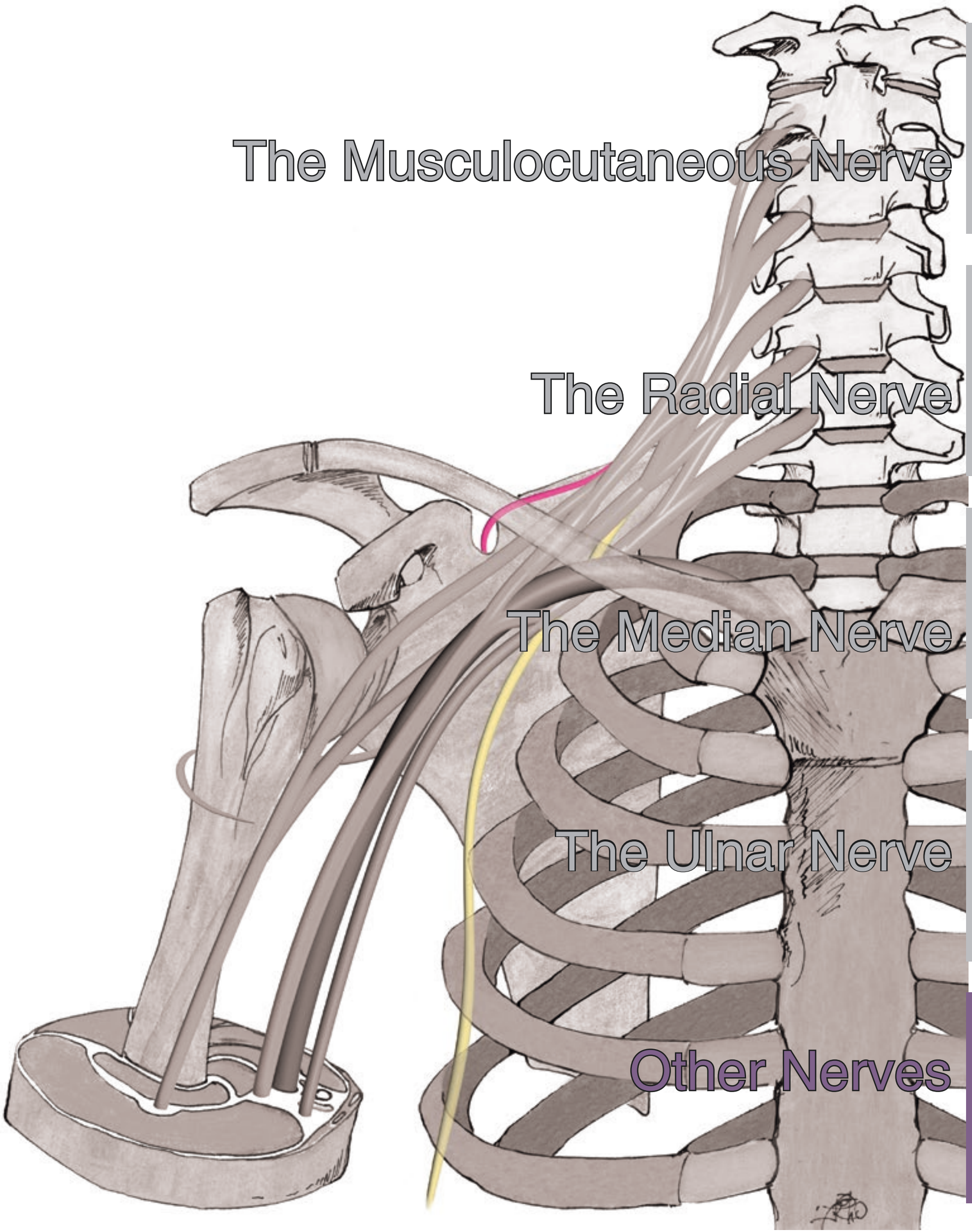

The Suprascapular Nerve

Morphological Data

The suprascapular nerve is a motor nerve. It is a collateral branch of the upper trunk of the brachial plexus and is responsible for the innervation of the scapular area.

Origin

It comes from the C5 to C6 roots, in the upper trunk of the brachial plexus. It originates where the brachial plexus splits into anterior and posterior division, at the level of the interscalene triangle (Figure SSc1).

Path

The suprascapular nerve's path is deep, at the ventral face of the trapezius and omohyoid muscles. It then goes behind the clavicle under the insertion of the trapezius. It goes above the scapula through the suprascapular notch on the upper border of the scapula (Figure SSc2).

At this level, it faces the suprascapular artery and the transverse scapular ligament. The nerve may give rise to a branch that accompanies the artery above the transverse scapular ligament.

It then goes through the spinoglenoid notch under the transverse scapular ligament and around the lateral border of the spine of the scapula in order to penetrate the infraspinous fossa, which is where the nerve ends (Figure SSc3).

Neurovascular Relations

In the suprascapular notch, the suprascapular artery, the transverse scapular ligament and the suprascapular nerve can be found from top to bottom (Figure SSc2).

Collateral Branches

The suprascapular nerve successively gives off:

- Articular branches for the acromioclavicular and glenohumeral joint.
- Cutaneous branches in 1/3 of individuals. These branches go through the suprascapular notch in front of the coracoacromial ligament and become subcutaneous when they perforate the deltoid muscle.
- Muscular branches for the supraspinatus muscle.

Terminal Branches

The suprascapular nerve ends at the level of the infraspinatus muscle when it distributes its motor fibres.

Motor Function

The suprascapular nerve takes charge of the innervation of the supraspinatus and infraspinatus muscles. The supraspinatus muscle is considered as the initiator of abduction movements and is in charge of elevating the head of the humerus at the beginning of abduction movements. The infraspinatus muscle allows movements of abduction and lateral rotation of the arm on the shoulder. Therefore, the suprascapular nerve takes charge of the elevation of the head of the humerus, the abduction and partially the lateral rotation of the arm.

Figure SSc1. The suprascapular nerve's relations with bones

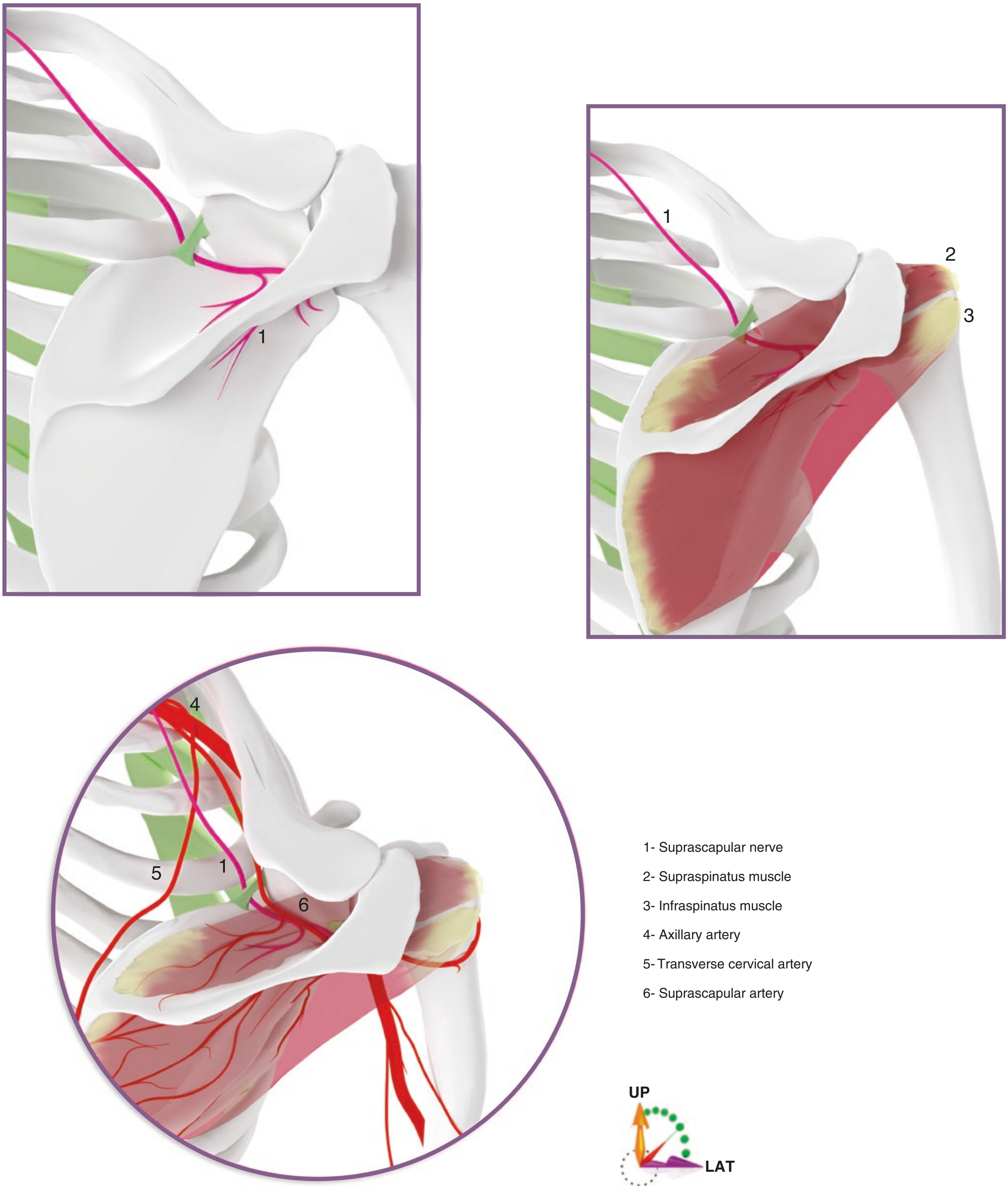

Figure SSc2. Osteoligamentous and vascular relations of the suprascapular nerve

1- Pectoralis major muscle

2- Pectoralis minor muscle

3- Cephalic vein

4- Deltoid muscle

5- Short head of the biceps brachii muscle

6- Coracobrachialis muscle

7- Tendon of the long head of the biceps brachii muscle

8- Latissimus dorsi muscle

9- Humerus

10- Teres major muscle

11- Lateral head of the triceps brachii muscle

12- Circumflex artery and nerve

13- Long head of the triceps brachii muscle

14- Teres minor muscle

15- Infraspinatus muscle

16- Scapula

17- Medial cutaneous nerve of arm

18- Median nerve

19- Medial cutaneous nerve of forearm

20- Ulnar nerve

21- Radial nerve

22- Musculocutaneous nerve

23- Subscapularis muscle

24- Serratus anterior

25- Intercostal muscles

26- Lateral thoracic artery

27- Suprascapular nerve

Figure SSc3. Axial section at axillary fossa through the suprascapular nerve

Pathologies

It can be compressed in the case of entrapment neuropathy at the level of the suprascapular notch (Figures SSc4 and SSc5)

Aetiology

- Traction: The apparition of this syndrome is caused by micro-traumas: sport, professional activity, traumatic movements of retropulsion, some constitutional abnormalities and muscle imbalance problems such as those caused by trapezius palsy.
- Compression: a clavicle fracture can lead to an injury of the suprascapular nerve if the fracture concerns the lateral part of the clavicle, in its descending part, under the insertion of the trapezius muscle.

  In medial rotation movements of the arm, the part where the suprascapular nerve goes through the suprascapular notch is a high-sensibility area. This compression can generally be found in sportspersons or individuals who have a job requiring repeated shoulder movements.
- Section: A section of the nerve can happen during shoulder, clavicle or scapular surgeries.

Clinical Significance

- Sensitive signs: The patient feels a dull, deep, shooting pain which exacerbates at night. Its first apparition can be sudden. The pain is situated in the posterolateral area of the shoulder and irradiates towards the acromioclavicular joint along the lateral border of the arm, towards the elbow, and can follow the radicular paths of C5 and C6. The pain is caused by cross body adduction and triggered by applying stress on the suprascapular joint, weakened by the elevation of the shoulder.
- Motor signs: Functional impairment is generally described as moderate. The motor deficit concerns the initial steps of the movement of abduction of the shoulder but not the whole movement, since the deltoid muscle is intact. It also becomes impossible for the patient to perform a complete lateral rotation. Another motor sign is a more or less extensive amyotrophy of the supraspinatus and infraspinatus muscles.

Complementary Examinations

- Shoulder and cervical spine radiographs are generally normal.
- Electroneuromyography: difficult to perform, but helps objectify an electrophysiological injury of the subscapular nerve.
- MRI and scanner can highlight an extrinsic compression.

Treatment

The first action should be a local corticosteroid infiltration. If this fails, treatment includes a surgical opening of the superior transverse scapular ligament and of the coracoacromial ligament sometimes associated with a removal surgery of an adenopathy which could worsen the compression. The result regarding pain is satisfying in 70% of cases. There is a better recovery for infraspinatus palsy than for supraspinatus palsy.

1. Suprascapular nerve
2. Supraspinatus muscle
3. Infraspinatus muscle
4. Teres minor muscle
5. Long head of the triceps brachii muscle
6. Teres major muscle
7. Lateral head of the triceps brachii muscle

Figure SSc4. Pathology of the suprascapular nerve: Anatomical structures going through the spine of the scapula near the surgical entry point (see following example)

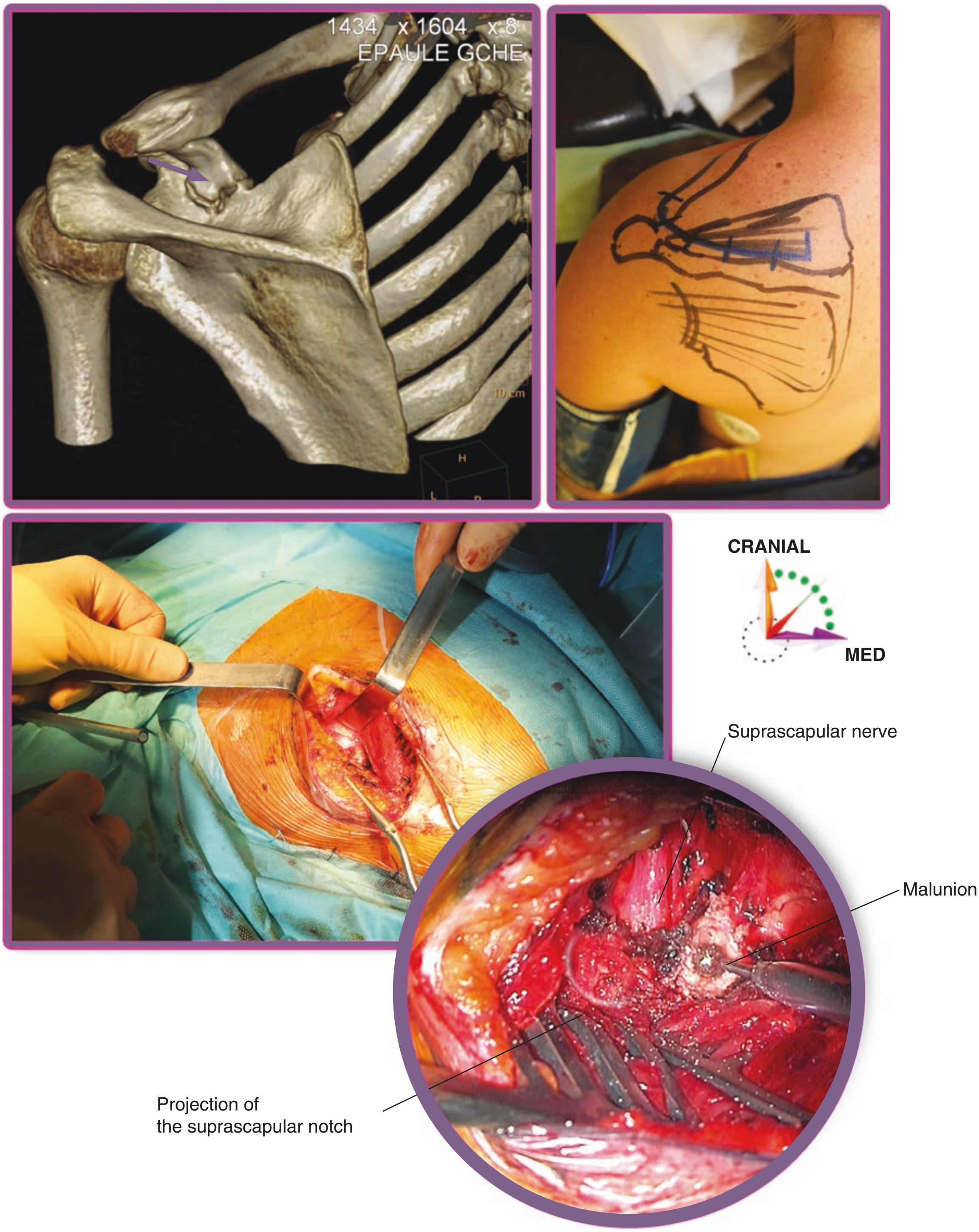

Figure SSc5. Case of a patient presenting a malunion after a fracture with important tilting of the left clavicle. The callus becomes a bridge between the lateral clavicular fragment and the spine of the scapula by ensheathing the suprascapular nerve at the level of the notch. This compression causes stitching pain in the shoulder which increases in intensity during rotation movements of the scapula; a disuse atrophy of the rotator cuff muscles with deficit of initiation of abduction of the shoulder can be noticed. A decompression surgery of the suprascapular nerve through suprascapular access has been suggested to this patient and allowed for a nerve release by partially milling the callus and the suprascapular notch