maining 1.9% of cases. These patients can also have tracheal stenosis; thus, a preoperative neck radiograph (AP, lateral view) or computed tomography is advised, and smaller endotracheal tubes and a backup for front-of-neck access should be arranged.

We conclude that every case of post-corrosive poisoning, acute or chronic, that requires tracheal intubation should be defined as a difficult airway case and appropriate arrangements according to available guidelines must be made to prevent airway mishaps [5].

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The novel diagonal suprascapular canal block for shoulder surgery analgesia: a comprehensive technical report

A combination of the sub-omohyoid suprascapular nerve (SSN) block and subscapularis plane (SSP) block can be administered to provide a "shoulder block." This innovative block is performed through an anterior approach and blocks the lower and upper subscapular nerves and axillary nerve at a proximal level [1].

Despite the evident benefits of this technique for shoulder surgery, the articular branch of the lateral pectoral nerve, supraclavicular branches of the cervical plexus, and musculocutaneous nerve are not affected The main advantage of this combined shoulder block compared with other techniques, such as the interscalene block, is the reduction in the motor and sensory block of the upper limbs and minimal phrenic paralysis [1,2].

Due to the more selective and safer profile of this shoulder block compared with other techniques, highly concentrated (low-volume) local anesthetics may be given in single-shot administrations to prolong the duration of the blockade, contributing to a painless first postoperative night [3]. The anterior approach of these blocks is paramount to minimizing patient discomfort and simplifying the procedure, which is particularly relevant in the trauma setting. However, most studies on the sub-omohyoid SSN block have shown a lack of brachial plexus or phrenic nerve sparing in several patients [4].

The prevertebral fascia only separates the SSN from the brachial plexus at the lateral sub-omohyoid plane. Therefore, even though the needle does not penetrate the fascia, in most cases the local anesthetic may spread to parts of the plexus. In fact, a study by Siegenthaler et al. [4] demonstrated that the median distance from the SSN to the brachial plexus was only 9 mm (range 4–18 mm) among 60 healthy volunteers. In a cadaveric study using 5 ml of dye, mild staining of the phrenic nerve was found in two of the nine dissections [5].

Due to the risk of phrenic nerve involvement, the sub-omohyoid SSN block may not be recommended for high-risk pulmonary patients. Additionally, this block is associated with a risk of significant upper limb sensory and motor block. Indeed, the target site for the sub-omohyoid SSN block is the region where the SSN exits out of the prevertebral compartment after coursing beneath the inferior belly of the omohyoid muscle (OHM) and branching off from the superior trunk.

The novel diagonal suprascapular canal (DiSC) block has been proposed to diminish these risks associated to sub-omohyoid SSN block. For the DiSC block, an anterior approach is used (in the supine position) away from the prevertebral compartment. In contrast to the sub-omohyoid SSN block, the DiSC block is performed along the suprascapular canal (SSC) from a superior incision point that accompanies the track of the SSN diagonally between the suprascapular and the spinoglenoid notches. In our approach for the "shoulder block", the DiSC block is combined with an SSP block.

After traveling posteriorly to the OHM, the SSN passes over the serratus anterior muscle (second rib level) and enters the supraspinatus fossa through the suprascapular notch.

In a cadaveric study, the SSN was found to bifurcate into the medial (MT) and lateral (LT) trunks at the suprascapular notch level, coursing along the floor of the supraspinous fossa to supply muscular and articular sensory innervation [5].

The MT has been found to primarily provide motor innervation to the anterior region of the supraspinatus, whereas the LT provides articular branches to the glenohumeral joint and motor innervation to the posterior region of the supraspinatus as well as the superior, middle, and inferior regions of the infraspinatus [5]. Articular branches of the SSN, which supply the posterior glenohumeral joint, have been reported to consistently originate from the LT close to the midpoint of a line connecting the suprascapular and spinoglenoid notches [5].

For this procedure, the patient is maintained in the supine position and a curvilinear probe is placed coronally at the level of the supraclavicular fossa, immediately posterior to the lateral third of the clavicle

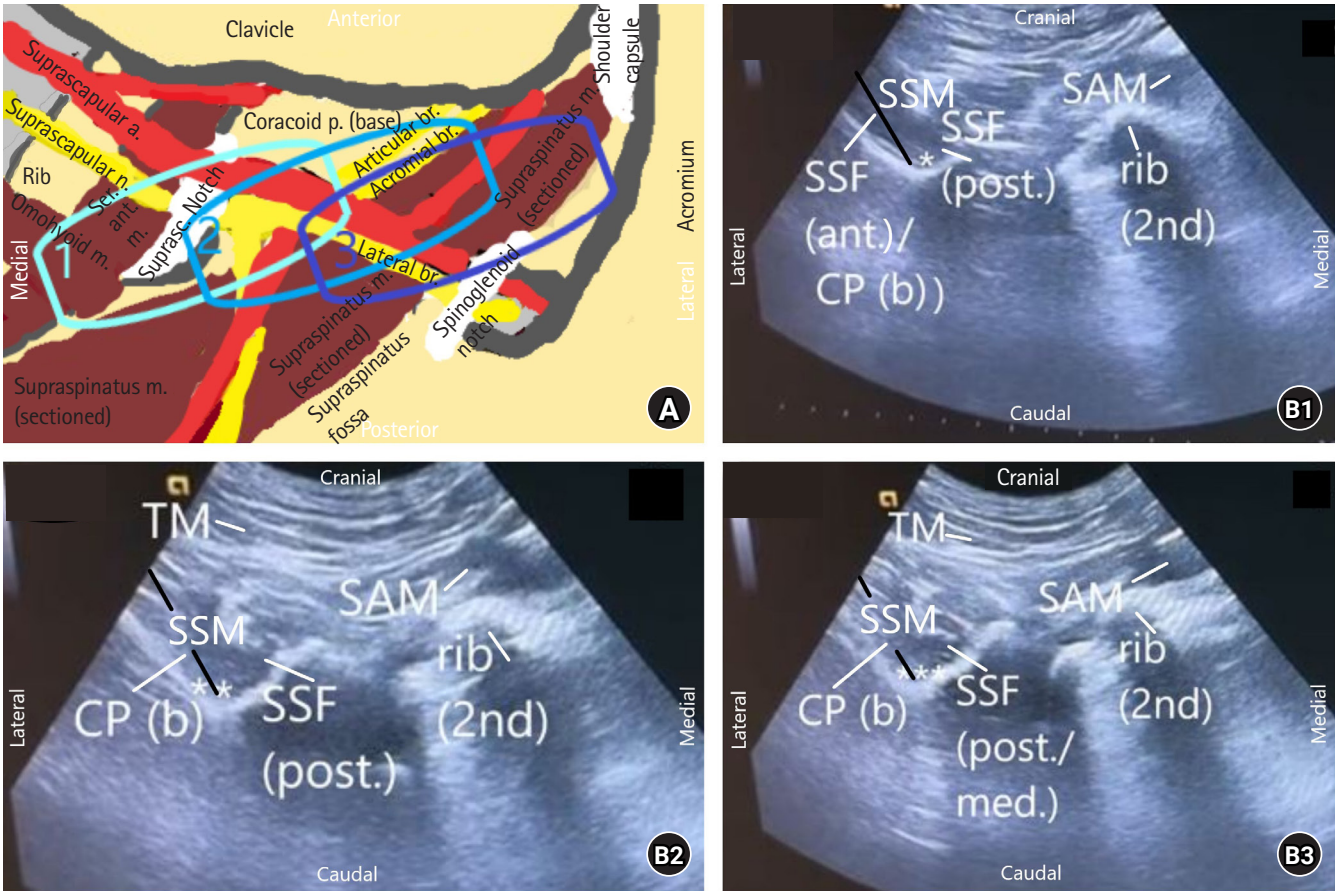

Fig. 1. Description of the novel diagonal suprascapular canal block. (A) Schematic representation of the relevant anatomy for performing the novel diagonal suprascapular canal block (vertical view with the supraspinatus muscle sectioned in its course is shown for visualization of the underlying structures). Relevant movements and adjustments of the probe are shown. As the position of the probe varies slightly (geometric forms 1, 2, and 3 are colored different shades of blue), different ultrasound images are shown for B1–B3 (labeled using the corresponding shades of blue). (B1–B3) Relevant sonoanatomy for performing the novel diagonal suprascapular canal block. Images were obtained at different points on the supraspinatus fossa. The vessels are barely visible in this diagonal view using a low-frequency probe despite the eventual use of the colored Doppler ultrasound image; therefore, the suprascapular vessels are not identified. (B1) At the entrance of the SSC (suprascapular notch), the slopes of the ultrasound SSC valley are less steep but at the bottom of that valley, the ultrasound beam penetrates deeply due to the lack of bony structures. At this point, by tilting the probe posteriorly or laterally, a complete ultrasound SSC valley can be visualized (B1 corresponds to ultrasound position 1 in A). (B2) By moving the probe posteriorly or laterally, the ultrasound SSC valley can be seen to continue fully formed (B2 corresponds to position 2 in A). (B3) In this position, the complete bony shadow starts vanishing (i.e., the bottom of the ultrasound SSC valley disappears), corresponds to the spinoglenoid notch (B3 corresponds to position 3 in A). At this point, by tilting the probe posteriorly or laterally, the SGNo is identified where the ultrasound beam starts to enlarge, traversing to deeper structures, which confirms that the prior image at position 3 is accurate. At the level of the suprascapular notch, the borders of the "valley" are less steep. The black lines in the ultrasound images represent the insertion of the needle in-plane at different positions. Ser. Ant. m. or SAM: serratus anterior muscle, SSF: scapular supraspinous fossa, post: posterior, ant: anterior, med: medial, lat: lateral, MB: medial branch, LB: lateral branch, m: muscle, a: artery, CP (b): coracoid process base. *suprascapular canal at the level of the suprascapular notch, **midpoint of the suprascapular canal, ***suprascapular canal at the level of the spinoglenoid notch.

(caudally oriented). The acromion remains immediately lateral to the probe. Ultrasound imaging allows for the borders of the SSC to be visualized, forming a triangle-shaped "valley." The borders of this valley are formed medially by the supraspinatus fossa and laterally by the base of the coracoid process. When the probe is slid in the posterior, medial-to-anterior, or lateral direction, the ultrasound beam reaches the spinoglenoid notch (lateral to this point, the floor of the SSC vanishes from view) (Fig. 1).

A total of 5–8 ml of local anesthetic is injected deep into the supraspinatus muscle (located beneath the trapezius muscle). The suprascapular artery may be observed at the bottom of the triangle-shaped valley but not at the suprascapular notch because it travels superiorly to the suprascapular ligament. The needle is inserted in-plane but can also be inserted out-of-plane medial to the acromion.

The use of a curvilinear probe is essential for performing a DiSC block because it allows a broad panoramic sonoanatomical view. With the DiSC block technique, all the SSN rami involved in shoulder innervation can be effectively blocked using a diagonal view of the SSC. On the other hand, an injection near the spinoglenoid notch may provide less of a supraspinatus motor block, sparing the lateral trunk, but may fail to provide significant shoulder analgesia [5]. Conversely, an injection in the vicinity of or beyond the spinoglenoid notch is easily noted with the DiSC block (Fig. 1).

Patients with rotator cuff tears involving the supraspinatus, infraspinatus, glenohumeral joint, or capsule pathology consistently feel pain relief after a DiSC block in the preoperative setting, which results in an increase in preoperative range of motion due to higher comfort with movements involving the deltoid and trapezius muscles. No motor block or loss of thermal sensation is observed distal to the shoulder. Further studies are required to confirm the feasibility of this approach.

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