Twenty-one patients presented a carotid pulse at the time of extraction but rapidly evolved to cardiac arrest within seconds.

An IOA was obtained in all victims, due to the impossibility of obtaining IV access. The prevalent injured organs were chest (42%) and head (40%). ROSC was obtained in 26 patients (54%).

As reported in Table I, the rescuers without USG spent 3.5 minutes to obtain IOA with two attempts, because of the lack of aspiration of bone marrow and the need to change the site of insertion.

ROSC was obtained in 92% of the patients in UG, while four patients had ROSC in NUG with a significant difference.

In our experience, the rescuers with USG established the IOA in two minutes rather than 3.5 minutes[4] (NUG), so it is possible to speculate that USG for IOA could provide benefits in obtaining ROSC, possibly due to the reduction of time to drug delivery in the systemic circulation.[5]

In conclusion, although multiple confounding factors exist in the context of a natural disaster setting, our findings call into attention the emergency equipment and this study shows that the use of a sonographic device can facilitate the proper insertion of IOA,[5] providing benefits in obtaining ROSC in OOH-TCA victims.

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Conflicts of interest.—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Authors' contributions.—Emiliano Petrucci collected the data, recruited patients and helped writing up the first draft of the paper; Vincenza Cofini conceived the epidemiological study design, statistical data analysis and writing up the first draft of the paper; Barbara Pizzi and Stefano Di Carlo helped in data collection; Stefano Necozione contributed to study design, data analysis and interpretation of data; Pierfrancesco Fusco conceived the study, participated in its coordination, collected data, contributed to the drafting of the manuscript; Franco Marinangeli revised the final version of the manuscript.

Acknowledgments.—The authors would like to express gratitude to all the volunteers of the Italian Soccorso Alpino e Speleologico for their support, and all of the people of Amatrice for their courage and pride.

History.—Article first published online: December 6, 2019. - Manuscript accepted: November 27, 2019. - Manuscript revised: October 24, 2019. - Manuscript received: August 2, 2019.

(*Cite this article as:* Petrucci E, Cofini V, Pizzi B, Di Carlo S, Necozione S, Fusco P, *et al.* Ultrasound-guidance for intraosseous access could improve resuscitation maneuvers. A retrospective data report on Italian earthquake victims. Minerva Anestesiol 2020;86:357-8. DOI: 10.23736/S0375-9393.19.14072-2)

Online version at http://www.minervamedica.it
Minerva Anestesiologica 2020 March;86(3):358-60
DOI: 10.23736/S0375-9393.19.14080-1

An alternative technique for effective pain management in upper extremity surgery: erector spinae plane block

A variety of techniques may be used for postoperative pain management following upper extremity surgery. Among these, interscalene, axillary, infraclavicular, and supraclavicular blocks may be applied as the primary intraoperative anesthetic or combined with general

anesthesia for postoperative pain control.[1] Another alternative is erector spinae block (ESPB), especially for chronic shoulder pain and postoperative analgesia after shoulder surgeries.[1, 2]

Herein, we present a case of successful postoperative pain management with ESPB for a 33-year-old, American Society of Anesthesiologists' (ASA) physical status I male (82 kg, 175 cm) who had surgery under general anesthesia for left distal humeral pseudoarthrosis due to previous fracture and malunion. The patient reviewed the case report and gave written permission for publication. With patient consent, we performed an ultrasound (US)-guided ESPB just before surgery under aseptic conditions using the GE Vivid Q® US device (GE Healthcare, Houston, TX, USA) with 12 MHz linear probe, and injected a 30 mL dose of 0.25% bupivacaine (Figure 1B, C).

A total dose of 200 μg fentanyl and 400 mg ibuprofen IV were administered intraoperatively. Postoperative pain assessment was performed using the visual analogue score (VAS) with "0" equaling no pain and "10" representing the most severe pain. The maximal VAS score was two. When compared with the contralateral upper extremity, the cold test showed sensorial blockade at anterolateral and posterior parts of the humerus, elbow, and wrist. However, there was no motor blockade. For postoperative analgesia, 800 mg ibuprofen was administered every eight hours. Over a 24-hour period, maximal VAS scores were one at rest and three during mobilization. The patient did not require any other rescue analgesic drug.

An increasing number of case reports and randomized controlled trials have widened the scope of the ESPB's application from cervicothoracic to lumbar spine.[3-5] Because the erector spinae muscles in the cervical region (iliocostalis cervicis, longissimus cervicis, semispinalis cervicis) insert at the C_{2-6} transverse processes, it is thought that the injected local anesthetic may spread around cervical nerve roots. Consequently, it is believed ESPB may be effectively used for shoulder and/or proximal upper limb analgesia with the advantages of reduced needle-nerve damage, minimal upper limb motor block, and reduced risk of phrenic nerve palsy when compared with brachial plexus block.[2]

In 2018, Forero *et al.* performed ESPB at the level of T_2 to treat chronic shoulder pain and reported successful pain management with local anesthetic spread to the level of C_3.[2] For acute postoperative analgesia after shoulder surgery, Selvi *et al.* reported a small case series in which two of three cases resulted in successful pain relief.[1] When ESPB was performed at the level of T_2, local anesthetic dispersion over the C_{4-7} region was reported in computed tomography images.[2] This encouraged us to perform ESPB for a patient who would have surgery at his distal humerus. As in shoulder pain cases, we observed that ESPB produced effective pain relief in humeral surgery when performed at the T_2 level. The mechanism for this may be related to innervation of the arm, which is provided by the C4-8 segments of the brachial plexus.[1, 2] Considering local anesthetic spread when ESPB is performed at the T_2 level, ESPB may block the musculocutaneous (C4-6), axillary (C5-6), median (C5-T1), radial (C6-T1), and ulnar (C8-T1) nerves, providing analgesia at the elbow, forearm, wrist, and even hand.

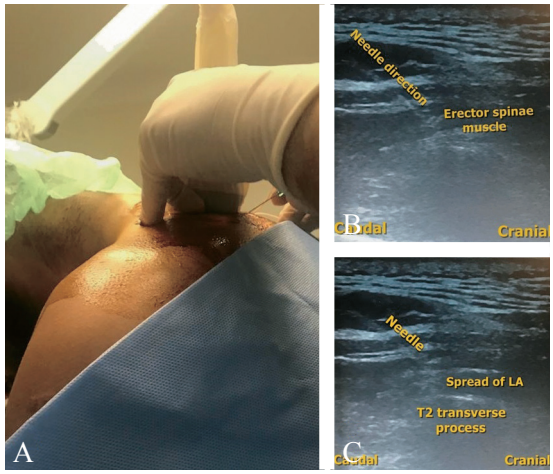

Figure 1.—A) Block performing under aseptic conditions at the T2 vertebral level with in plane technique. A 22-gauge 50-mm block needle was inserted in a caudad to cephalad direction; B) sonographic anatomy and needle direction; C) spread of local anesthetic.

In summary, ESPB may provide effective analgesia after upper extremity surgeries. Future case reports and randomized trials are needed to further elucidate its analgesic effectiveness.

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Conflicts of interest.—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

History.—Article first published online: December 6, 2019. - Manuscript accepted: October 8, 2019. - Manuscript revised: September 23, 2019. - Manuscript received: August 7, 2019.

(*Cite this article as:* Ekinci M, Ciftci B, Atalay YO. An alternative technique for effective pain management in upper extremity surgery: erector spinae plane block. Minerva Anestesiol 2020;86:358-60. DOI: 10.23736/S0375-9393.19.14080-1)

Online version at http://www.minervamedica.it
Minerva Anestesiologica 2020 March;86(3):360-1
DOI: 10.23736/S0375-9393.19.14099-0

Preoperative MRI characteristics and short-term postoperative outcomes of microvascular decompression in trigeminal neuralgia with no vascular compression

Trigeminal neuralgia, which is divided into idiopathic and secondary, has recently been becoming a major source of incidences, however, the reasons for it are not clear yet.[1] Studies[2, 3] have shown that vascular compression and no vascular compression are two types of trigeminal neuralgia. The value of magnetic resonance imaging (MRI) is used to diagnose the vascular compression.[4] In addition, preoperative MRI leads to the preparation and evaluation of microvascular decompression (MVD) before surgery. However, there are only a few reports of MRI in the case of no vascular compression type of trigeminal neuralgia. At present, MRI examination on the cerebellopontine angle where the trigeminal neuralgia occurs is mainly MRA, heavy T2, and magnetic resonance tomographic angiography (MRTA). It should be noted that medium signal characteristics in MRI 3D-TOF-MRTA sequence examination can be used to judge the relationship between the nerves and blood vessels. In other words, implementing thin scan on cerebellopontine angle make it possible to assess the vascular compression.[5] The main focus of this study is to investigate the relationship between the preoperative 3D-TOF-MRTA sequence characteristics and the perioperative outcomes of microvascular decompression in no vascular compression type trigeminal neuralgia and provide a theoretical reference for the diagnosis and treatment of no vascular compression type trigeminal neuralgia.

For this study, 21 patients with no vascular compression type trigeminal neuralgia were selected from our hospital. The patients consisted of 11 males and 10 females with age ranged 34 to73 years (average age 57.6±2.5) and had this disease from 0.7 to11 years (average period 6.5±1.2 years). In addition, 12 patients had pain in left part and nine in right part. In preoperative MRTA examination, 21 cases in the group did not show vascular compression. In other words, the NVC grading score was found zero which is confirmed by endoscopy during operation, in which two cases were found with small cholesteatoma compression where the contents were excised and outer membrane was peeled completely in the MVD procedure, ten cases had arachnoid adhesions where MVD was used to completely peel and comb patients' trigeminal nerve root, three cases were found with temporal bone protuberance, in which protuberance compression on trigeminal root was observed during operation, and then distorted root was partially rendered and the Teflon film was placed to straighten the nerve, and finally six cases found without any compression were implemented with nerve root combing during MVD operation. After one week of the MVD treatment, out of 21 cases, 16 cases had facial pain disappearance (Score I), five cases were found with facial pain relief (Score II-III) and no case was found with invalid facial pain (Score IV-V). For the facial pain relief cases, 250 mg/day carbamazepine was used to control the pain.

In the present study, we found that after one week of MVD treatment, from 21 cases, 16 cases were found with facial pain disappeared (score I), five cases were found with facial pain relieved (score II-III) and no case was found invalid (score IV-V). This implies that MVD could play an important role in the treatment of no vascular compression type trigeminal neuralgia.

MRTA showed that trigeminal neuralgia patients were negative, which indicates no obvious vascular compression. Such cases were sometimes encountered in clinical practice. In this study, two cases of microcholesteatoma compression type where MRTA examination did not show significant vascular compression, the endoscopy in the MVD operation showed that the patient's trigeminal nerve root was compressed by a 4-mm-diameter rounded mass and further proved to be cholesteatoma after pathologic study. Thus, the contents were excised in MVD operation and then the outer membrane were completely peeled and as a result, one patient had facial pain disappearance and the other had facial pain relief after seven days of operation. In this