

## CASE REPORT

# Color Doppler Ultrasound-guided Axillary Brachial Plexus Block in Patient without Brachial Pulse: A Case Report

Abbas Ahmadi<sup>1\*</sup>, Javad Amini Saman<sup>1</sup>, Bahman Roshani<sup>1</sup>

Color Doppler ultrasound-guided regional block like brachial plexus block lately changed other anesthesia and analgesia practice because of the accuracy and simplicity of practice to view the anatomy of blood vessels and nerves. With color Doppler ultrasound-guided regional block you can follow needle track to nerves and prevent any vessel puncture. It can be the standard for any regional block. The patient was a 64 years Iranian who had diabetes mellitus and hypertension and planned as an urgent right upper limb amputation surgery. Because of the acute exacerbation of COPD due to pneumonia we decided to use regional anesthesia for this patient. On the first physical examination there was no peripheral pulse in patient's right hand. With ultra-sonographic color Doppler the pulselessness of right hand artery were monitored. With the anatomic and awareness of grey-scaled ultrasonography the nerves and vessels were found. Axillary brachial plexus block with guidance of grey-scaled ultrasonography were done and the surgery was successfully performed and patient transferred to ICU for post operation care after surgery.

**Keywords:** axillary block; ultra-sonographic guided block; color Doppler sonography; Grey-scaled ultrasonography; chronic obstructive pulmonary disease

Color Doppler ultrasound-guided regional block like brachial plexus block lately changed other anesthesia and analgesia methods because of accuracy and simplicity of practice to view the anatomy of vessels and nerves. With color Doppler you can follow needle track to nerves and prevent any vessel puncture and it can be the standard for regional blocks. During gray-scale sonography the vessels can mimic nerve roots so with color Doppler we can diagnose nerve plexus [1]. We had side effects like hematoma due to blind local anesthetic injection [2]. Other side effects like incomplete spread of local anesthetic or toxicities can be mentioned [3-4]. In this case we have a 64 years old patient candidate for urgent upper limb amputation. The patient had diabetes mellitus and chronic hypertension and chronic obstructive pulmonary disease. Because of the acute exacerbation of pneumonia, we decided to use regional anesthesia for this patient. The patient did not have right upper limb arterial pulse so with guidance of grey-scaled ultrasonography and anatomic landmarks the brachial plexus was diagnosed and blocked.

## Case Description

A 64 Iranian man with history of diabetes mellitus and hypertension and COPD underwent right upper limb amputation due to necrosis. Because of the acute

exacerbation of pneumonia, we decided to use regional anesthesia for this patient. The amputation was from lower humerus so we had decided to do axillary plexus block. The vital signs were monitored. Patient complained of pain. After informed consent, the patient was prepared for axillary brachial plexus block with catheter fixation. The patient was sedated with 1 milligram midazolam and 5 mcg fentanyl prepared after gray-scaled sonography with high frequency linear probe (Samsung, Providian Medical, Korea). With color Doppler guidance there was no sign of any pulse or perfusion. With changing the views of the transducer no more views were captured. With guidance of anatomy of muscles and axillary artery and vein, the median, ulnar, radial and musculocutaneous nerves were diagnosed and posterior to axillary artery 20 mm lidocaine 1.5% was injected with lateral to medial out of plane approach. The musculocutaneous nerve was also blocked. The surgery was finished after 90 minutes. The patient was transferred to ICU and later discharged.

## Discussion

Peripheral nerve injury is not frequent in regional anesthesia and it is estimated to be 0.5–1.0% [5]. Regional anesthesia with gray-scaled ultrasonography is the primary method of evaluation of the nerve plexus. The presence of aberrant vessels that can be a risk factor in regional anesthesia is estimated to be near 86% and 90% [6]. Small arteries can mimic the nerves and make problem with regional blocks guided with gray scaled ultrasonography, so we can beneficially use color Doppler ultrasonography [1]. In a healthy patient with no anomaly or past medical history the vessels coming with nerves and with ultrasound guided regional block we can scan this combination. In our patient there were no detected pulses, so there was no guidance of color Doppler ultrasonography for identification of vessels

From the <sup>1</sup>Department of Anesthesiology, Imam Reza Hospital Center, Kermanshah University of Medical Sciences, Kermanshah, Iran.

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\*Corresponding author: Abbas Ahmadi, MD. Department of Anesthesiology, Imam Reza Hospital Center, Kermanshah University of Medical Sciences, Kermanshah, Iran. E-mail: abbasahmadi27@yahoo.com

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and nerve bundles. So with grey scaled ultrasonography and without any side effects intended nerves were blocked. The operator proficiency to work with the grey scaled ultrasonography can help to identify the anatomy of the vessels and simultaneous nerves.

## Conclusion

In our case without awareness and proficient practice in grey-scaled ultrasonography we couldn't safely block the brachial plexus. We recommend diagnosing the vessels and nerves primary with gray-scaled ultrasonography before color doppler guided ultrasonography.

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