

Successful Supraclavicular Block in Patient with Brachial Plexus Anatomical Variation

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INTRODUCTION

The supraclavicular approach of the brachial plexus block is typically used for upper extremity procedures distal to the shoulder. Ultrasound guidance has been useful in identifying brachial plexus anatomy and reducing inadvertent pleural and vascular puncture (1,2). Although not common, anatomical variations in brachial plexus anatomy can occur and may have clinical significance when performing peripheral nerve blocks (3,4). Thus, a thorough understanding of typical and atypical anatomy is crucial to a successful nerve block.

OBJECTIVES

- Review Supraclavicular Brachial Plexus Anatomy
- Discuss brachial plexus anatomical variation
- Discuss importance of understanding anatomy to perform successful block

CASE PRESENTATION

- 34 –year-old man with no PMH and no prior head or neck surgery presented to an ambulatory care center for scaphoid open reduction and internal fixation after sustaining a closed transverse fracture of the scaphoid of the left wrist
- Anesthetic plan for regional anesthesia with supraclavicular and intercostobrachial nerve block
- Thorough preoperative assessment was completed. Patient denied pallor, paresthesia, or weakness prior to injury.

Figure 1: Supraclavicular View

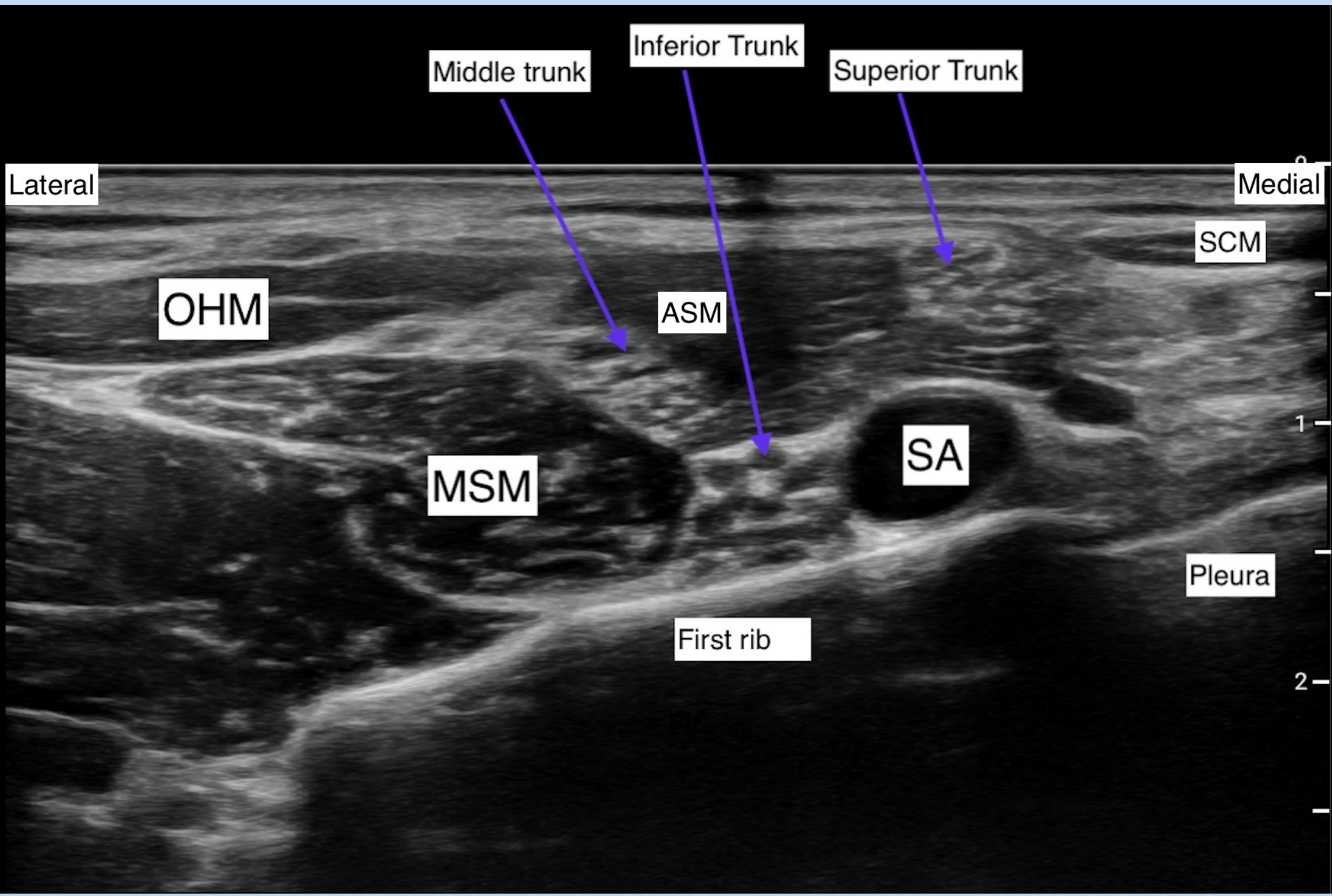
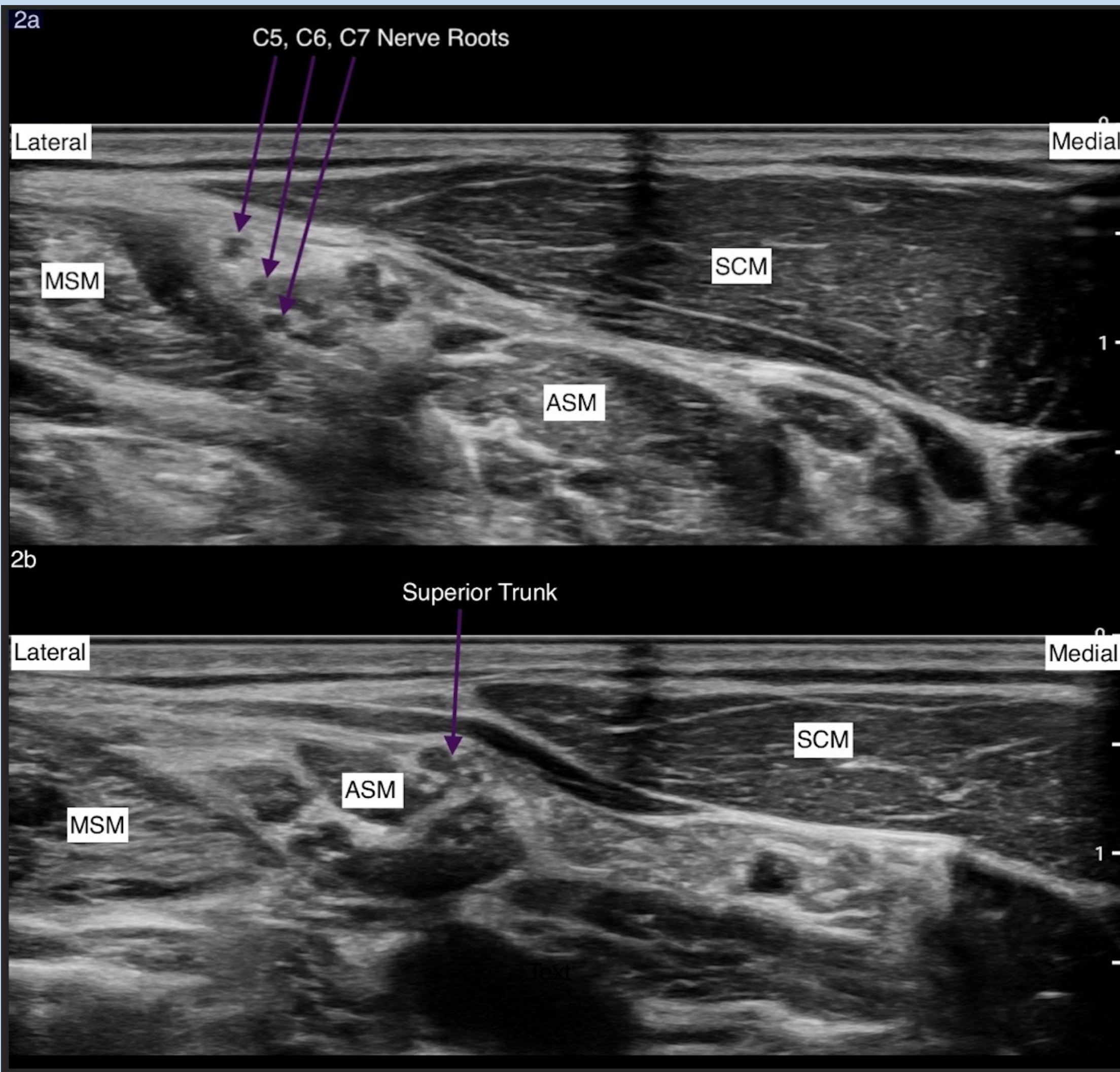


Figure 2: Interscalene View and Caudal Scan



- The superior, middle and inferior trunks were not in their typical orientation and were separated by individual muscle layers.
- The superior trunk was located medial to the anterior scalene muscle and superomedial to the subclavian artery (SA).
- The inferior and middle trunks were located in their usual location medial to the middle scalene muscle and lateral to the SA.
- However, the inferior and middle trunks were separated by the anterior scalene muscle

- Upon scanning cephalad for a more comprehensive scan, we obtained an interscalene view which revealed typical interscalene brachial plexus anatomy in which C5, C6, and C7 were located between the scalene muscles [Figure 2].

- As we scanned caudad approaching the supraclavicular view, we observed that the superior trunk traveled medial to the belly of the anterior scalene muscle [Figure 3].

DISCUSSION

- The recognition of atypical brachial plexus anatomy allowed us to perform a successful supraclavicular nerve block under ultrasound guidance. All three trunks of the brachial plexus were separated by individual muscle layers and could not be blocked using a traditional approach. Instead, local anesthetic was deposited near each trunk. If this anomaly was not recognized, the superior trunk may have been missed resulting in an incomplete block.
- It is also important to recognize that brachial plexus anatomical variations are associated with certain pathologies such as thoracic outlet syndrome (5).
- Thoracic outlet syndrome is a group of diverse disorders that results in compression of neurovascular structures. It typically manifests as symptoms of the shoulder and upper extremity such as pallor, paresthesia, weakness, muscle atrophy and pain (6). Although the patient described above did not have symptoms, his atypical brachial plexus anatomy places him at increased risk for nerve impingement and possible thoracic outlet syndrome.
- This case highlights the importance of ultrasound-guided peripheral nerve blocks in order to identify anatomical variations and patients with risk factors for nerve impingement.

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