

Anterior Scalene Muscle Block for Diagnostic Evaluation of Presumed Thoracic Outlet Syndrome in Adolescents

-Two Case Reports

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1. INTRODUCTION

- **Thoracic Outlet Syndrome (TOS)** is rare and difficult to diagnose, especially in pediatric patients.
- **Challenges in Diagnosis:** Symptoms overlap with other conditions, and traditional tests may be inconclusive due to patient cooperation and the dynamic nature of TOS.
- **Anterior Scalene Muscle Block (ASMB) as a Diagnostic Tool:** A minimally invasive method to confirm neurogenic TOS (nTOS). Its role in pediatrics remains unclear.

2. PURPOSE

- To emphasize the value of ASMB in diagnosing and guiding treatment in pediatric patients, filling a gap in the existing literature.

3. CASE DESCRIPTIONS

• Case 1

- ❖ History and Symptoms
 - A 12-year-old girl (48.9 kg) presented with right arm weakness, numbness, and intermittent edema for 9 months, along with daily flare-ups and hand discoloration.
- ❖ Examination and Imaging
 - Positive EAST (Elevated Arm Stress Test), normal EMG, and chest MRA showing positional subclavian vein compression without thrombosis.
- ❖ Procedure
 - **Ultrasound-guided Anterior Scalene Muscle Block (ASMB) was performed under minimal sedation using a 22-gauge, 50-mm Sono-TAP needle (PAJUNK®, Germany) with 5 mL of 0.5% ropivacaine (Figure 1A, 1B).**
- ❖ Outcomes
 - Symptoms improved within 60 minutes (increased strength, reduced tingling), with relief lasting until the evening.
- ❖ Follow-up
 - Referred for surgery; underwent first rib excision and brachial plexus neurolysis. Postoperatively, symptoms were completely resolved.

Anterior scalene muscle block is a valuable diagnostic tool for pediatric neurogenic thoracic outlet syndrome. It provides immediate symptom relief, helps confirm neurovascular compression, and guides treatment decisions.

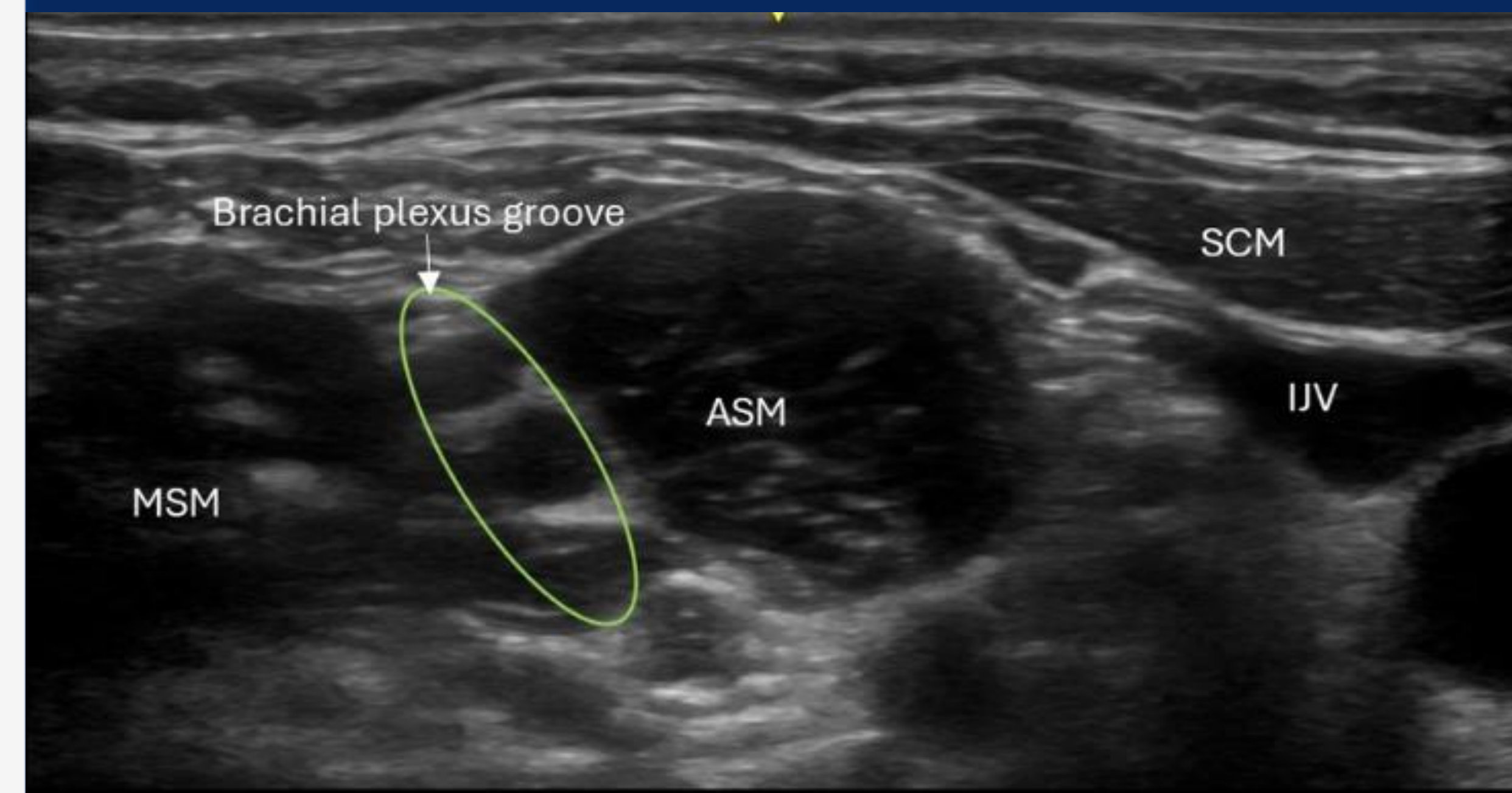


Figure1A.

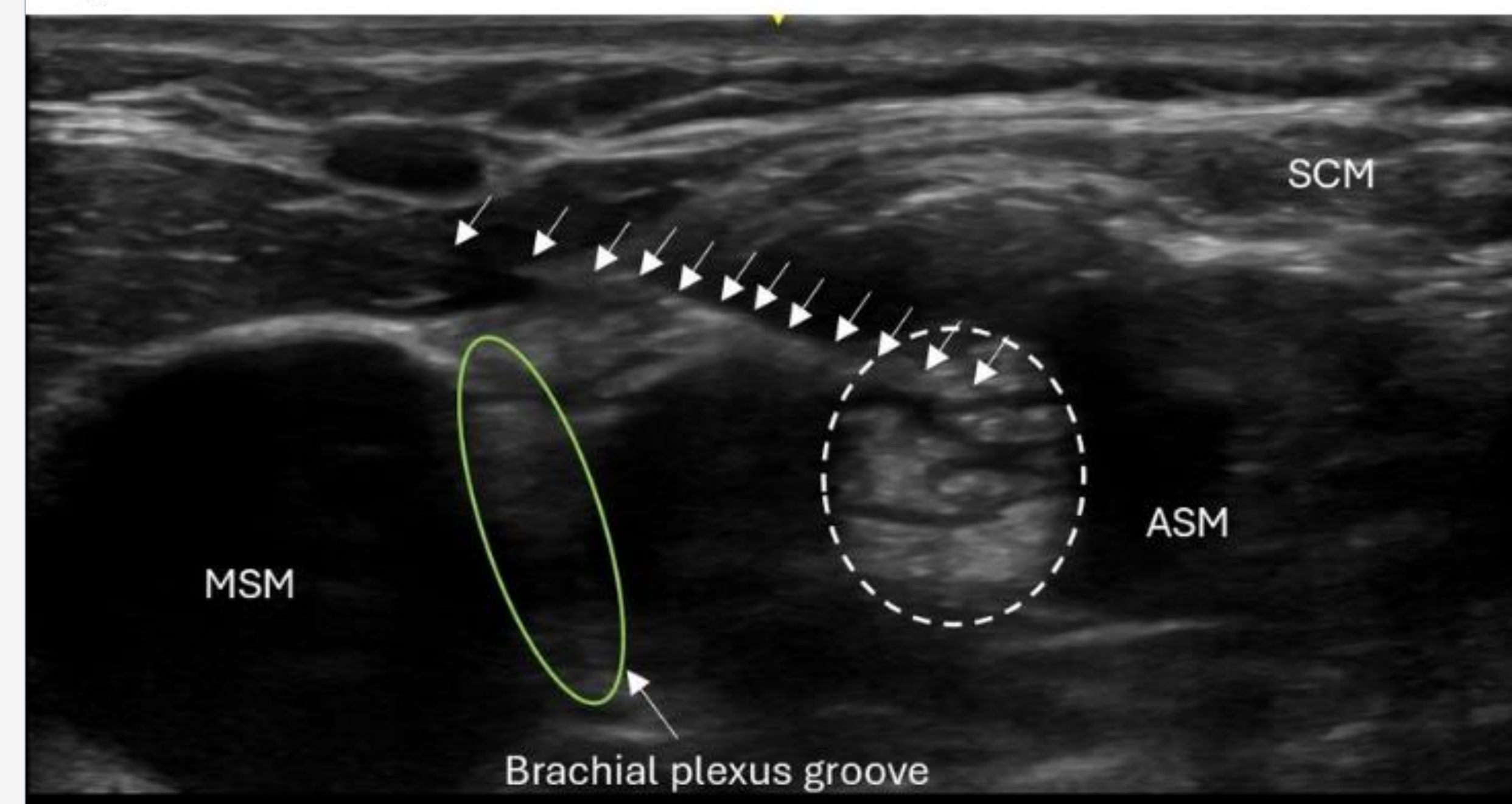


Figure1B.

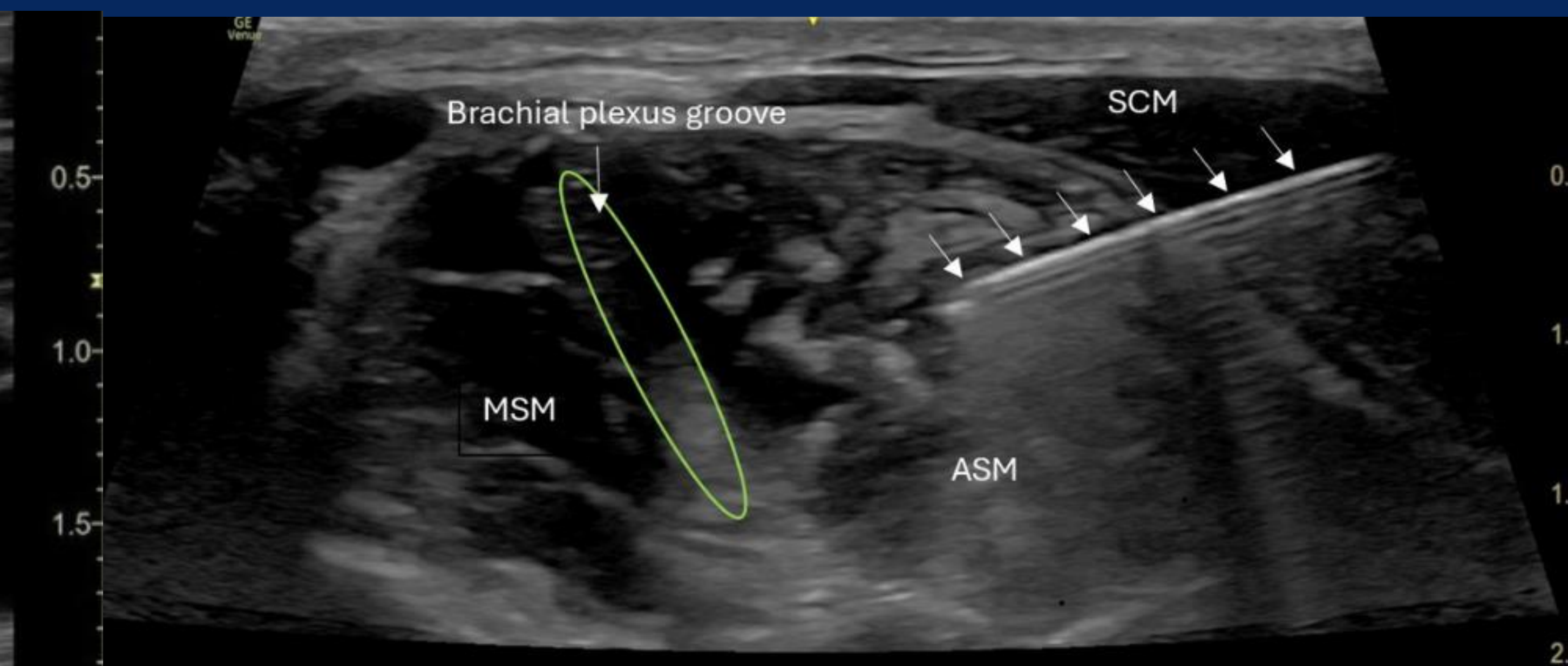


Figure2A.



Figure2B.

• Case 2

- ❖ History and Symptoms
 - A 15-year-old girl (54.8 kg) presented progressive right upper arm pain (8–9/10) over 9 months, along with sharp, radiating pain to fingers, paresthesia, decreased sensation, and trapezius muscle spasms.
- ❖ Imaging
 - MR brachial plexus and chest showed right subclavian vein compression in the costoclavicular space during abduction.
- ❖ Procedure
 - **Ultrasound-guided Anterior Scalene Muscle Block(ASMB) was performed under minimal sedation using a 24-gauge, 40-mm Sono-TAP needle (PAJUNK®, Germany) with 5 mL of 0.5% ropivacaine (Figure 2A, 2B).**
- ❖ Outcome
 - Immediate pain relief, no numbness with arm movement. Developed transient right-sided Horner's syndrome and shoulder weakness, both of which resolved quickly.
- ❖ Follow-up
 - Referred for surgery; underwent first rib excision one month later. Postoperatively, pain significantly decreased, and arm/hand paresthesia completely resolved.

4. DISCUSSION

- **ASMB can facilitate early diagnosis** by providing immediate symptom relief, confirming neurovascular compression, and reducing the need for extensive imaging studies and consultations.
- **ASMB guides treatment decisions**, including surgery, with temporary and self-limiting side effects. Further studies are needed to refine its role and optimize its use in pediatric care.