International Journal of Medical Science in Clinical Research and Review
Online ISSN: 2581-8945
Available Online at https://ijmscrr.in/ Volume 7|Issue 06 (November-December) |2024 Page: 1365-1368

Case Report

Horner's syndrome following ultrasound-guided inter-Scalene Brachial Plexus Block for Diagnostic Arthroplasty: Case Report of a Rare Complication

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Article Received: 13-October -2024, Revised: 03-November-2024, Accepted: 23-November-2024

ABSTRACT:
Interscalene brachial plexus block is a common technique for postoperative pain management after shoulder surgery. While generally safe and effective, it can lead to unintended complications, including Horner's syndrome. This case report describes a 30-year-old female who developed transient left-sided Horner's syndrome on postoperative day 2 following an ultrasound-guided ISB with continuous infusion of ropivacaine for diagnostic shoulder arthroscopy. The patient did not have any pre-operative systemic disease or co-morbidities such as diabetes, hypertension etc. Despite the initial uneventful course, the patient developed ptosis and miosis on the second postoperative day. The patient was managed by discontinuation of the anaesthetic medication .The symptoms resolved spontaneously after discontinuing the local anaesthetic infusion on the third day. This case highlights the importance of recognizing and managing this potential complication of interscalene block, particularly when using continuous infusion techniques.

Keywords: Diagnostic arthroscopy, Inter-scalene block, local anaesthetic toxicity, Horner's syndrome

INTRODUCTION:

Diagnostic shoulder arthroscopy is a minimally invasive surgical procedure commonly used to visualize the internal structures of the shoulder joint. This technique allows for accurate diagnosis and treatment of various shoulder conditions, such as rotator cuff tears, labral tears, and impingement syndrome [1, 2]. Diagnostic arthroplasty can be performed with various anaesthetic techniques. Generally, local anaesthesia is preferred. [3]

Interscalene brachial plexus block is an important local anaesthetic technique that has gained popularity for its effectiveness in providing postoperative pain relief. [4] This technique involves injecting a local anaesthetic into the interscalene space, which blocks the transmission of nerve impulses from the brachial plexus to the shoulder and upper arm [5].

While interscalene blocks are generally safe and effective, they can be associated with certain complications. These include :

- Bleeding/Hematoma , Puncture of vascular structure , Epidural or subarachnoid injection, Local anesthetic toxicity , Total spinal anesthesia , Permanent nerve injury and Horner's syndrome . [6] Another study reported peripheral neurologic injuries, respiratory complications, and central nervous system complications. [7].

Horner's syndrome arises from dysfunction of the sympathetic nervous system innervating the face, leading to a characteristic triad of ptosis (drooping eyelid), miosis (constricted pupil), and anhidrosis (decreased sweating) on the affected side [8]. The most common causes of Horner syndrome include stroke, tumours, trauma, and carotid artery dissection [9].

A rare cause of Horner's syndrome is after inter-scalen block post-operatively. Walid et. al reported Horner's syndrome following infra-clavicular block that appeared spontaneously and subsided after 40 minutes [10]. Similarly, Horner's syndrome has also been reported

after spine surgeries. One such case was reported after scoliosis surgery, while the other ones were reported after decompression and fusion of cervical spine surgeries. [11, 12]. The cases are believed to be related to the spread of local anaesthetic to the sympathetic chain or its branches. [8, 10, 11, 12].

This case report presents a 30-year-old female patient who developed Horner's syndrome after undergoing diagnostic shoulder arthroscopy with an ultrasound-guided interscalene brachial plexus block. The case highlights the importance of recognizing and managing this potential complication of interscalene block.

Case Presentation:

Patient History:

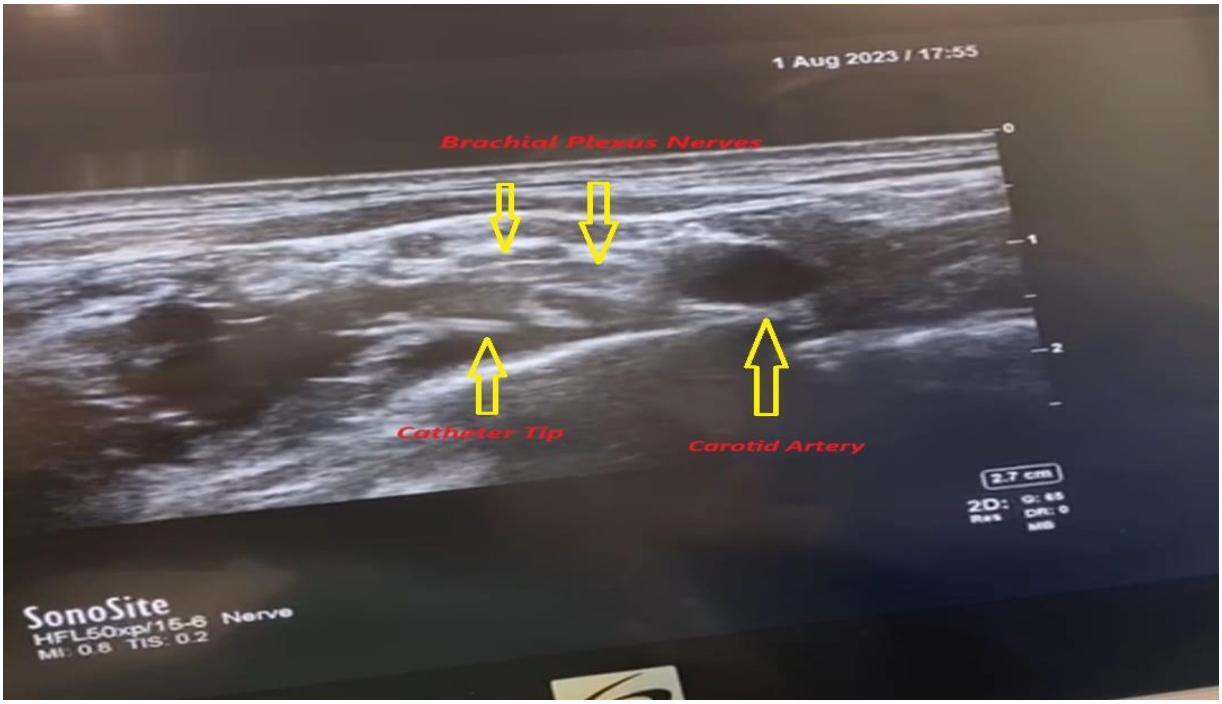
A 30-year-old female patient was scheduled for diagnostic arthroscopy of the left shoulder. She had no significant past medical history or known drug allergies.

Clinical Presentation:

The patient was admitted for the procedure without any prior complaints or systemic symptoms. Preoperative evaluation revealed no contraindications to regional or general anaesthesia.

Anesthesia Management:

The patient was administered general anaesthesia for the procedure. Additionally, an ultrasound-guided left inter-scalene brachial plexus block was performed for postoperative pain management. A catheter was placed, and 15 mL of 0.5% Naropin (ropivacaine) was injected through the catheter. Postoperatively, a continuous infusion of 0.2% Naropin was initiated at 20:00 hours on the same day at a basal rate of 3 mL/hour, with patient-controlled boluses of 3 mL and a lockout time (LOT) of 30 minutes.



Postoperative Course and Complications:

On postoperative day (POD) 1, the patient reported effective pain control, with no observed complications. However, on POD 2, she developed left-sided Horner's syndrome, characterized by ptosis and miosis. The local anaesthetic infusion was immediately discontinued upon identifying the complication.

Postoperative Management:

The patient was closely monitored after the discontinuation of the local anaesthetic infusion. On POD 3, the manifestations of Horner's syndrome had completely resolved without requiring further intervention. Follow-up revealed no residual neurological deficits or complications.

DISCUSSION:

This case highlights an unusual but well-documented complication associated with interscalene brachial plexus blocks: Horner's syndrome. The syndrome, characterized by ptosis, miosis, and anhidrosis, results from the unintended spread of local anaesthetic to the sympathetic chain at the cervical level, specifically the stellate ganglion. While the condition is typically benign and self-limiting, it can cause significant concern for both patients and clinicians.

In this case, the patient developed Horner's syndrome on postoperative day 2 despite an uneventful block placement and initial postoperative course. The use of an indwelling catheter for continuous infusion of ropivacaine likely contributed to the delayed onset of symptoms. This aligns with existing literature, which indicates that continuous infusions increase the risk of local anaesthetic spread to nearby structures due to prolonged exposure. [7,9]

While transient Horner's syndrome is often harmless and resolves without intervention, its occurrence underscores the need for careful monitoring during continuous regional anaesthesia [8]. In this case, the immediate discontinuation of the ropivacaine infusion facilitated the resolution of symptoms by postoperative day 3, indicating that early identification and appropriate management are critical. This case reinforces the importance of educating patients about potential complications associated with regional anaesthesia, including their benign nature and reversibility in most instances.

This case underscores the importance of utilizing ultrasound guidance and vigilance in monitoring patients receiving continuous peripheral nerve blocks. Adjustments in infusion parameters, such as reducing basal rates or selecting a less concentrated local anaesthetic, could minimize the risk of complications without compromising analgesic efficacy. Additionally, further research into optimizing catheter placement techniques and assessing individual patient anatomical variations may help prevent similar occurrences.

This case report illustrates a rare but significant complication of interscalene brachial plexus block: transient Horner's syndrome. The complication was likely due to local anaesthetic spread to the stellate ganglion during continuous infusion of ropivacaine. Prompt recognition and cessation of the infusion facilitated complete resolution of symptoms within 24 hours, with no lasting neurological deficits.

Clinicians performing regional anaesthesia should remain vigilant for such complications and educate patients about potential adverse effects. By ensuring timely intervention and optimizing infusion protocols, the risks associated with regional anaesthesia can be minimized while preserving its benefits in postoperative pain management.

CONCLUSION:

This case highlights a rare but recognized complication of ultrasound-guided interscalene brachial plexus block: Horner's syndrome. While the condition is generally benign and self-limiting, it underscores the importance of careful anaesthetic dosing, vigilant monitoring, and prompt intervention. The successful resolution of symptoms in this patient emphasizes the value of a multidisciplinary approach to perioperative care. This case serves as a reminder to anticipate and manage even rare complications to ensure patient safety and optimal outcomes.

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