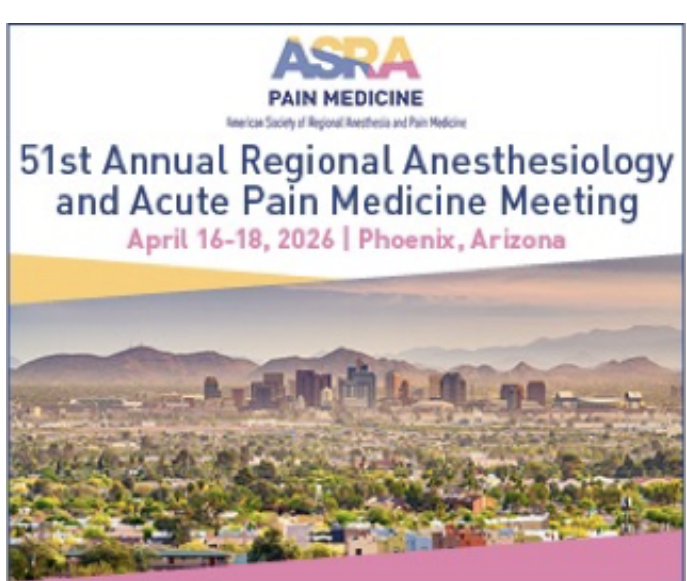
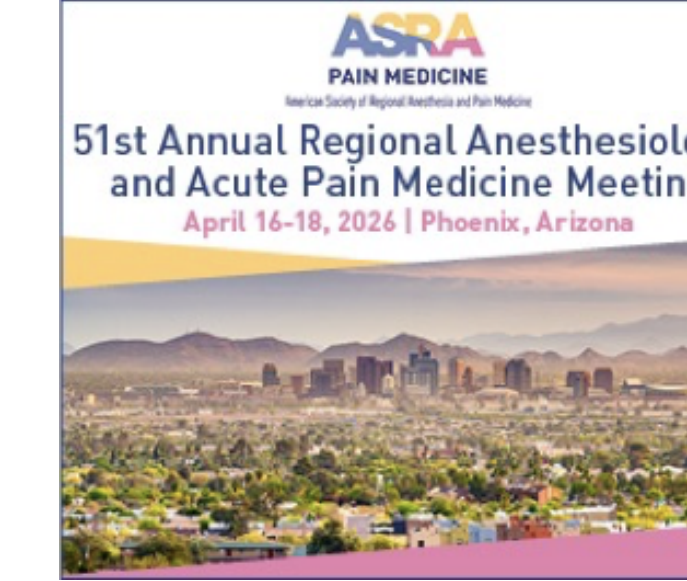




# Postoperative Respiratory Distress after Interscalene Nerve Block

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## BACKGROUND

The interscalene nerve block (ISB) is commonly used for analgesia in shoulder and proximal upper extremity surgery. Due to the proximity of the phrenic nerve to the brachial plexus, hemidiaphragmatic paralysis occurs and may cause transient respiratory compromise in susceptible patients.

While postoperative hypoxemia after an interscalene nerve block is often attributed to phrenic nerve block, persistent hypoxia should prompt evaluation for other underlying etiologies.

## INTRODUCTION

The brachial plexus is made up of C5-T1 nerve roots, which provides sensory and motor innervation to the upper extremity. The interscalene nerve block targets the brachial plexus between the anterior and middle scalene muscles, anesthetizing the C5-C6 nerve roots. It often spares the inferior trunk (C8-T1), making it less suitable for more distal upper extremity procedures. There are several important nearby structures, which local anesthetic spread could lead to side effects, such as Horner’s syndrome, hoarseness, or phrenic nerve blockade.

## CASE PRESENTATION

~ A 65 year old female with a past medical history of end stage glenohumeral osteoarthritis, anxiety, depression, gastroesophageal reflux disease (GERD), hypertension, and coronary artery disease (CAD) was scheduled for an elective right reverse shoulder arthroplasty,

She received a single shot ultrasound guided interscalene nerve block using 10 ml 0.5% Bupivacaine and 133 mg of liposomal bupivacaine.

## CASE PRESENTATION

The block was performed without any complications using a 21g echogenic B bevel needle with mild sedation of midazolam and fentanyl.

### Postoperative Course

The patient developed hypoxemia, requiring 6 L/min of supplemental oxygen via facemask. She improved to 2L/min nasal cannula by the end of her PACU stay. Her oxygen requirements persisted as she was transferred to the floor. The patient did not have an oxygen requirement at baseline. Initial workup included chest x ray, which showed clear lungs and CT angiography, which was negative for pulmonary embolism, but showed mild atelectasis and coronary calcification.

On postoperative day 2, patient developed exertional chest pain, dyspnea, and diaphoresis. Further evaluation showed troponin elevation (mid 200s). EKG showed normal sinus rhythm. Cardiac catheterization showed 80% stenosis of the ostial/proximal LAD. A drug eluting stent was placed with complete resolution of hypoxemia and other symptoms.

## DISCUSSION

Hemidiaphragmatic paralysis occurs in patients after interscalene nerve blocks due to phrenic nerve involvement. This is particularly detrimental in patients who are obese, have obstructive sleep apnea, COPD, or other causes of low pulmonary reserve. This can manifest in transient hypoxemia while the block is in effect.

However, it should be noted that persistent postoperative hypoxemia should not be only attributed to the interscalene nerve block. Other differentials can contribute, including atelectasis, pneumonia, pulmonary embolism, residual anesthesia, and myocardial ischemia.

## DISCUSSION

Given the patient's history of coronary artery disease, family history of MI, and presentation of ischemic chest pain, a cardiac etiology was confirmed. This led to appropriate management of her CAD, leading to placement of cardiac stent, which led to complete resolution of symptoms.

## CONCLUSION

Persistent hypoxemia after interscalene nerve block should lead to an assessment of broad differential diagnoses, rather than just attributing only to phrenic nerve block from the interscalene nerve block. In this patient, she did not have any risk factors that would lead to particular concern to developing respiratory distress after receiving an interscalene nerve block. She had a normal BMI and did not have any respiratory medical conditions. However, she did have risk factors of myocardial ischemia, such as her history of CAD. Early recognition of alternative differentials can play a large role in improving patient outcomes.

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