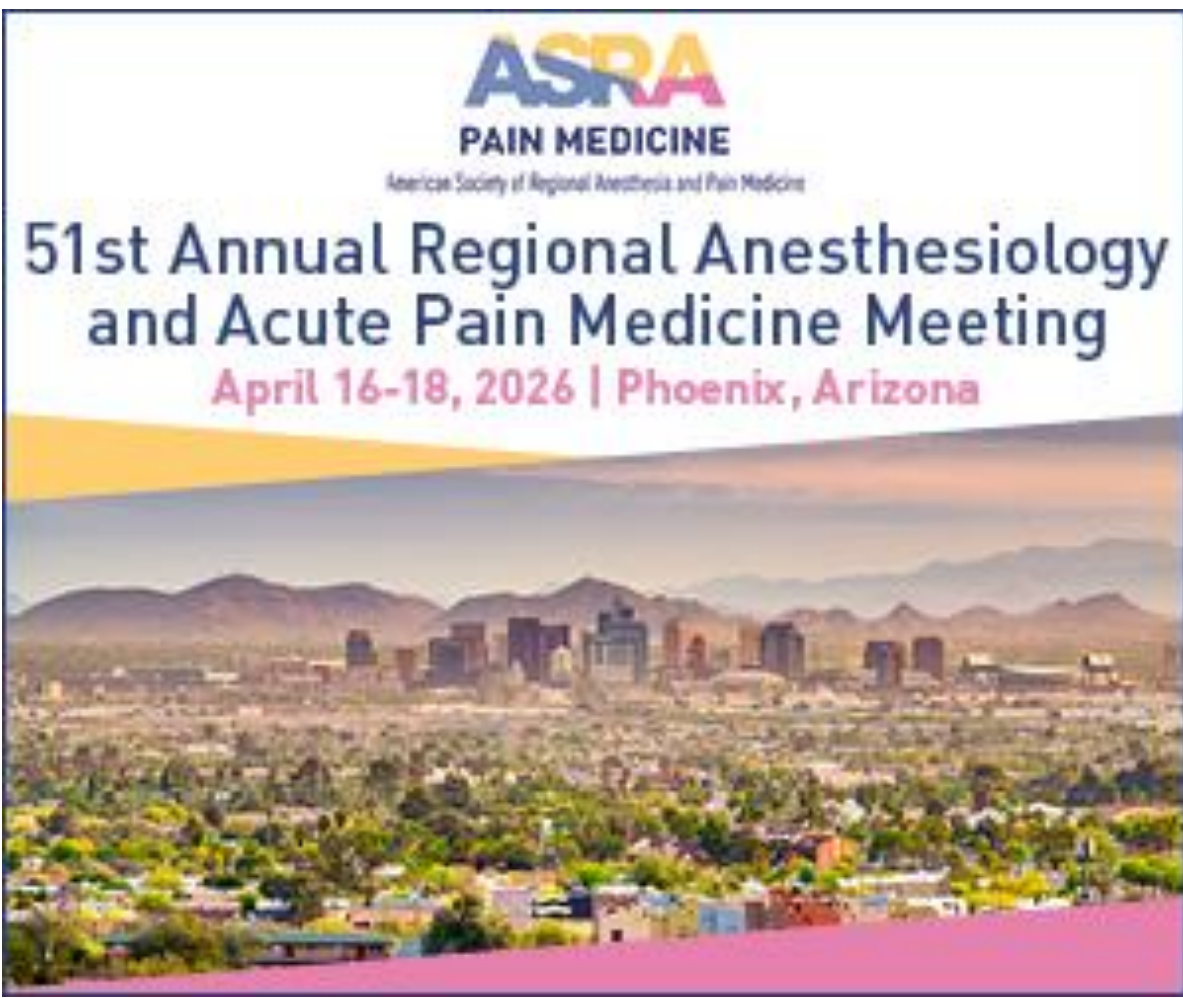


Suspected epinephrine induced supraventricular tachycardia (SVT) following multiple truncal nerve blocks.

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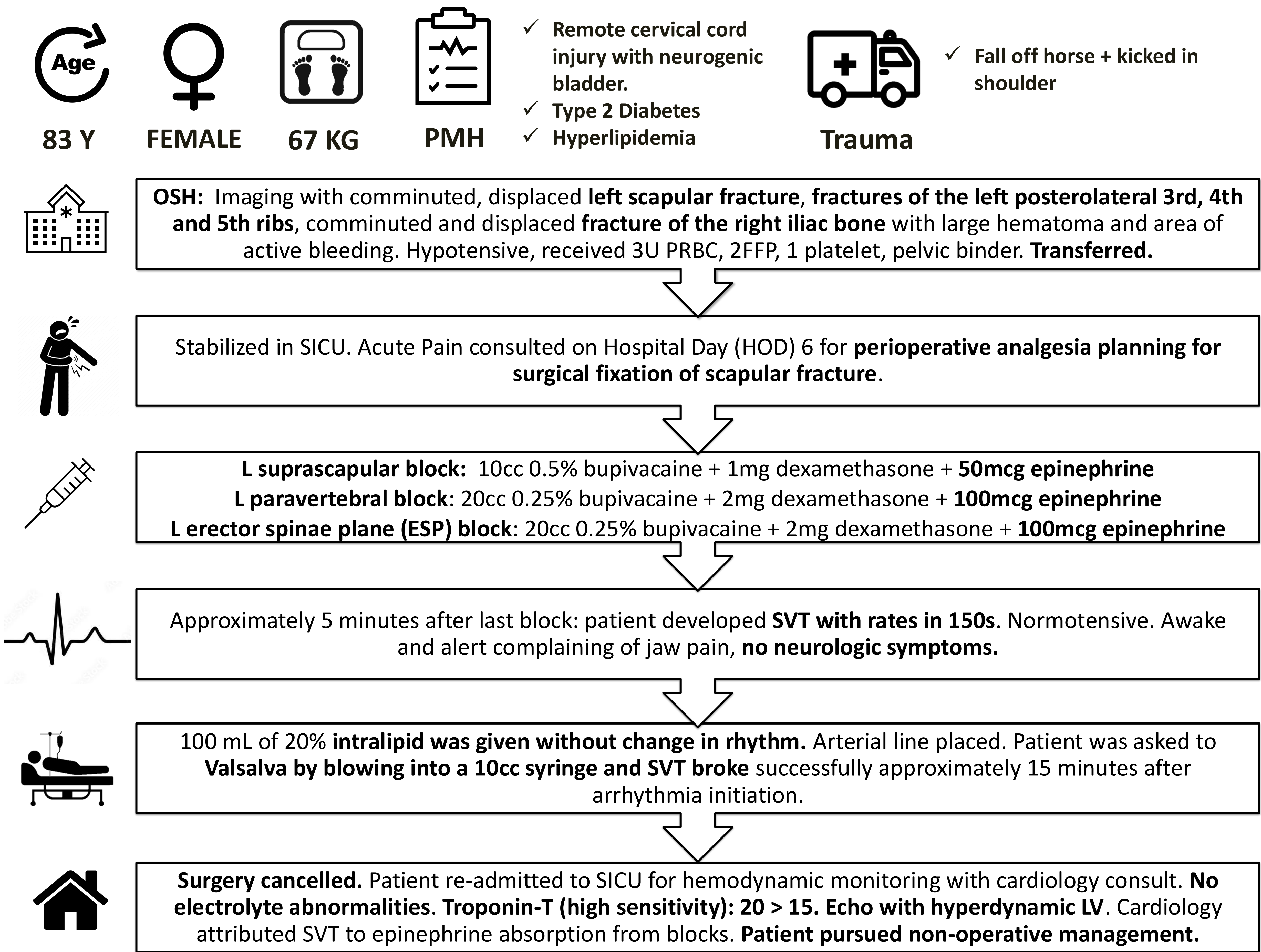
INTRODUCTION

- Epinephrine is a well-known and prevalent adjunct to local anesthetics for peripheral nerve blockade.¹
 - Induces vasoconstriction of local vasculature.
 - Prolongs nerve blockade by reducing systemic absorption.
 - Reduces risk of local anesthetic toxicity (LAST).²
 - Useful marker of potential intravascular injection.
- Both truncal and chest wall blocks tend to have higher vascular absorption of local anesthetic + adjuvants.
- Epinephrine can induce adverse cardiovascular sequelae when administered intravenously.
 - β_1 receptor agonism on cardiac myocytes increases chronotropy, shortens refractory period, facilitating tachyarrhythmias such as SVT.³
 - Epinephrine often used to facilitate SVT and VT in electrophysiology studies.
 - Direct adrenergic agonism may also precipitate uncontrolled hypertension.
- In this case, we present a suspected incident of epinephrine induced SVT following multiple nerve blocks utilizing epinephrine as an adjunct.



• *Figure 1:* Acute comminuted displaced intra-articular left scapular fracture. Minimally displaced anterior coracoid process fracture. Left 3rd to 5th rib fractures

CASE PRESENTATION



DISCUSSION

- Epinephrine acts primarily through β_1 -adrenergic stimulation, increasing SA node automaticity, AV nodal conduction, and myocardial excitability. Shortens the refractory period and may facilitate re-entrant tachyarrhythmias like SVT.³
- Alternative explanations:
 - LAST was considered but less likely:
 - Total bupivacaine dose below recommended maximum limits.
 - Absence of classic neurologic prodrome (perioral numbness, tinnitus, altered mental status).
 - Lack of response to lipid emulsion therapy.
 - Unrecognized intravascular injection, however:
 - No immediate hemodynamic changes during injection.
 - Aspiration negative throughout all blocks.
 - Delayed presentation may suggest gradual systemic absorption.
- Contributing risk factors:
 - Multiple blocks increasing cumulative epinephrine dose.
 - Advanced age with potential arrhythmogenic susceptibility.
 - Possible contribution from baseline hyperdynamic LV.

While uncommon, systemic epinephrine absorption may precipitate tachyarrhythmias without clear intravascular injection. Clinicians should weigh the benefits of epinephrine with patient-specific risk and cumulative dosing.

References

- ¹ Nestor CC, Ng C, Sepulveda P, Irwin MG. Pharmacological and clinical implications of local anaesthetic mixtures: a narrative review. *Anaesthesia*. 2022;77(3):339-350. doi:10.1111/anae.15641
- ² Tschopp C, Tramèr MR, Schneider A, Zaarour M, Elia N. Benefit and harm of adding epinephrine to a local anesthetic for neuraxial and locoregional anesthesia: a meta-analysis of randomized controlled trials with trial sequential analyses. *Anesth Analg*. 2018;127(1):228-239. doi:10.1213/ANE.00000000000003417
- ³ Cismaru G, Rosu R, Muresan L, et al. The value of adrenaline in the induction of supraventricular tachycardia in the electrophysiological laboratory. *Europace*. 2014;16(11):1634-1638. doi:10.1093/europace/euu042