



Introduction

Local Anesthetic Systemic Toxicity (LAST) is a rare but potentially life-threatening complication arising from excessive plasma concentrations of local anesthetics, typically due to inadvertent intravascular injection, overdose, or impaired drug metabolism. Characterized by progressive central nervous system and cardiovascular disturbances—including seizures, arrhythmias, and cardiovascular collapse. LAST demands rapid recognition and prompt intervention to prevent severe morbidity or mortality. Increased awareness of risk factors, early clinical indicators, and evidence-based management strategies such as lipid emulsion therapy has significantly improved outcomes. Understanding the pathophysiology and prevention of LAST remains essential for all clinicians involved in regional anesthesia and procedural sedation.

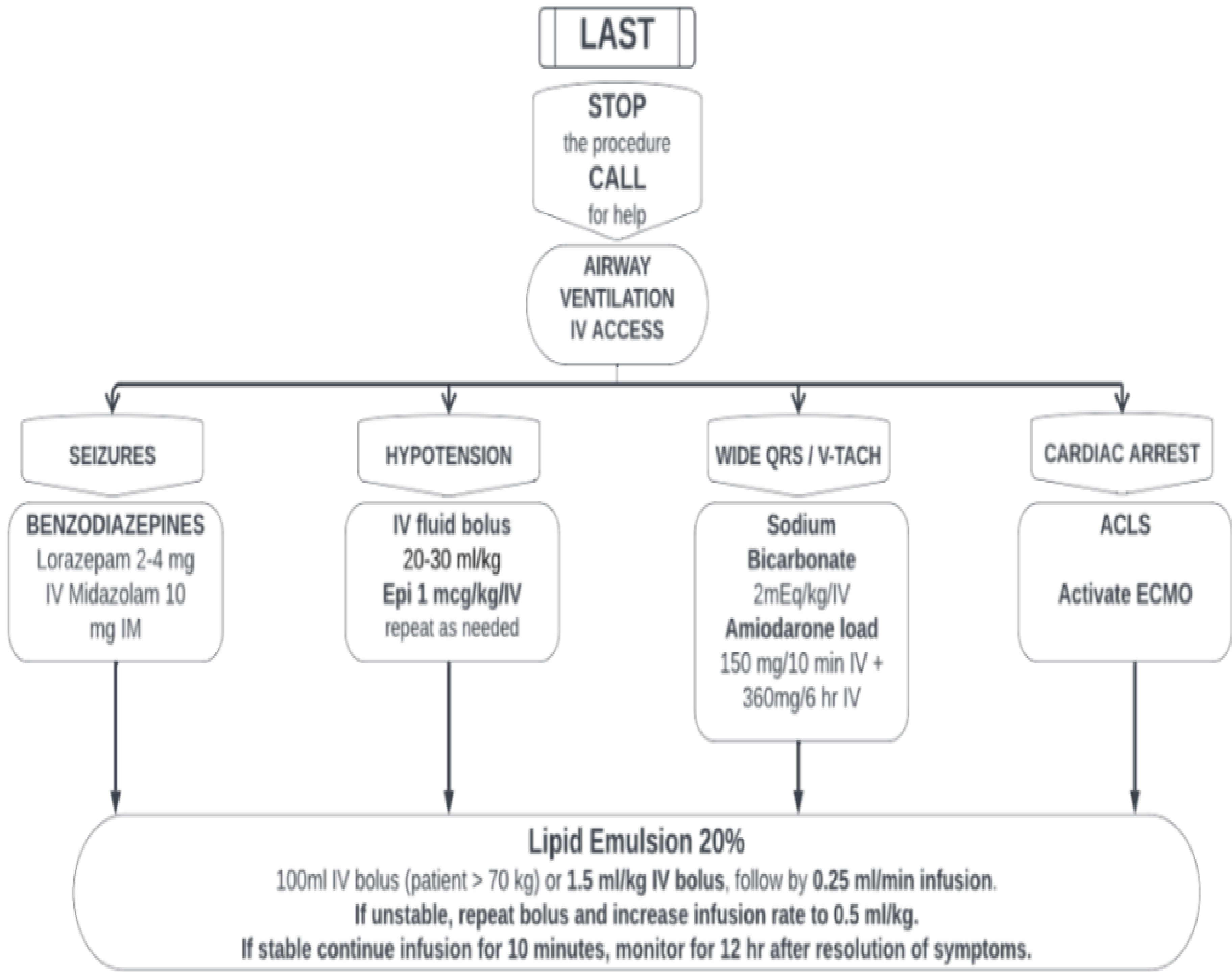
Case Presentation

The patient was a 24-year-old male with no significant past medical history who underwent an adenectomy under general anesthesia. The case was uneventful and towards the end of the case, the surgeon administered a total of 30 cc of 0.25% bupivacaine. Although the patient only received 150 micrograms of fentanyl throughout the case along with 2 mg of midazolam at the beginning of the case, during the extubation period, patient was not responding to commands nor was he becoming more alert. After approximately half an hour of non-responsiveness, the decision was made to administer naloxone with no immediate improvement. Eventually, the patient did begin to respond to commands and was deemed safe for extubation. Patient was still very confused and not quite alert after extubation but was protecting his airway. After being dropped off in PACU, the anesthesia team received a message from the PACU that patient was altered and confused. Upon returning to the patient, his extremities were trembling, and patient was demonstrating seizure like activity. 4mg of midazolam were immediately administered and lipid emulsion treatment was promptly started. Labs were drawn which were insignificant. The patient began to markedly improve after lipid emulsion therapy was started. ICU and neurology were consulted, and a stat head CT was performed which demonstrated no significant pathology. While in the CT machine, patient began to complain of ringing in his ears, so another round off lipid emulsion therapy was readministered when he returned to PACU after which the ringing subsided. After the second round of treatment, patient was stable, alert and no longer confused. He was admitted overnight with no further seizures and discharged the next day.

Case of LAST syndrome in a routine adenectomy

Waheed Asif, Tagert Smith, Jennifer McDonald

Nuvance Anesthesia Residency Program at Vassar Brothers Medical Center, Poughkeepsie, NY



Local Anesthetic Systemic toxicity algorithm

References

Song K, Blankenship RB, Derian A. Local Anesthetic Toxicity. [Updated 2025 Sep 16]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK499964/>

LAST: Local Anesthetic Systemic toxicity – Sinai EM

Shalaby M, Sahni R, Hamilton R. Local anesthetic systemic toxicity: awareness, recognition, and risk mitigation in the emergency department. Clin Exp Emerg Med. 2024 Jun;11(2):121-126. doi: 10.15441/ceem.24.231. Epub 2024 May 23. PMID: 38778495; PMCID: PMC11237253.



Discussion

As more regional procedures are taking places in outpatient settings, far from centers that have intensive care units and ecmo capabilities on site, understanding the pathophysiology, promptly recognizing the symptoms and initiating immediate treatment are paramount to the successful treatments and resuscitation. In the case of our patient, he was most likely suffering from seizures while under general anesthesia and therefore his symptoms were being masked. An important component of the prompt identification and treatment of the patient was in fact a highly trained nursing staff familiar with anesthesia complications who undergo frequent drills to treat LAST syndrome. It is also taken for granted by many anesthesia providers that other medical professionals are familiar with this syndrome and in fact, it was highly unnerving when the neurology consulting team was unaware that local anesthesia poisoning can lead to seizures. Well trained staff and adequate resources are paramount to successful and prompt treatment. Simple things such as knowing where lipid emulsion or the code for the code cart can mean the difference between successful treatment and unacceptable outcomes.

Conclusion

Local Anesthetic Systemic Toxicity (LAST) continues to be an important clinical concern despite advances in regional anesthesia techniques and safety practices. The syndrome’s highly variable presentation—ranging from subtle neurologic symptoms to sudden cardiovascular collapse—underscores the need for continuous vigilance during and after local anesthetic administration. Current evidence highlights the value of incremental dosing, ultrasound guidance, and careful patient selection in reducing the incidence of LAST. Equally essential is preparedness: immediate access to resuscitation equipment and 20% lipid emulsion therapy has transformed management and improved survival. Ongoing education, simulation training, and adherence to established guidelines are critical to enhancing early recognition and coordinated response. As regional anesthesia becomes increasingly common across diverse clinical settings, a strong understanding of LAST pathophysiology, prevention, and management remains central to optimizing patient safety.