

Anesthetic Management for the Severely Decompensated ALS Patient: Three Different Anesthetics During a Single Hospitalization

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Introduction

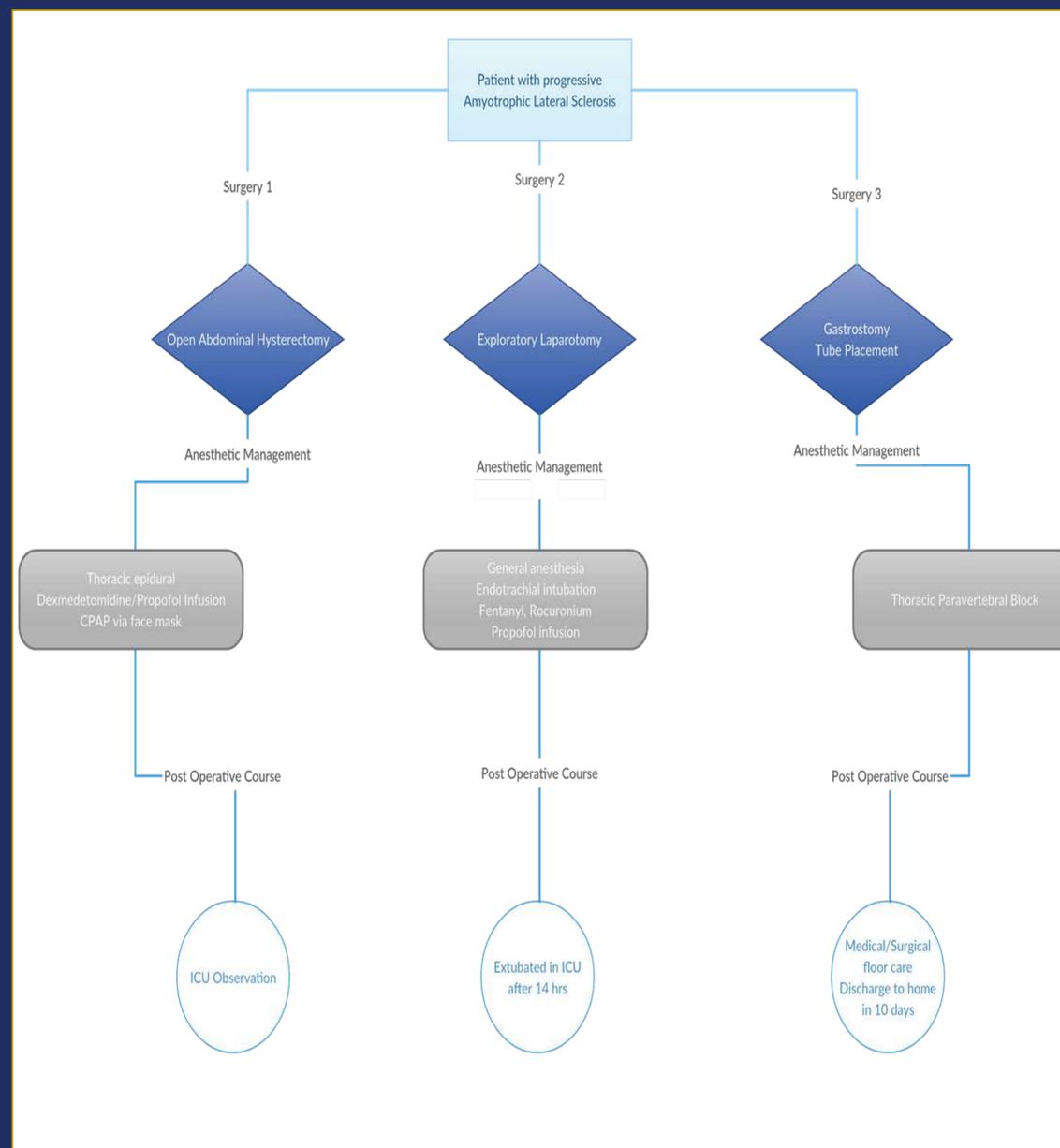
Amyotrophic Lateral Sclerosis (ALS) patients presenting for procedures requiring anesthesia introduce uncommon challenges to the anesthesiologist. With a prevalence of approximately 1.5-2.7 per 100,000 persons, ALS is a rare disease with myriad presentations. Motor dysfunction due to upper and lower motor neuron disease leads to increased risk of aspiration and respiratory complications both at baseline and in the peri-operative period.

Case reports of anesthetic management for ALS patients are available, but recommendations for anesthetic technique are difficult to support with robust data. While our department regularly works with ALS patients with advanced disease, we less commonly provide multiple anesthetics for a single ALS patient in a short timeframe. We present one patient who required three procedures during one 28 day hospitalization for which she successfully underwent three different anesthetic techniques.

Case Report

- 81 y/o F with diabetes mellitus, hypertension, congestive heart failure, ventricular tachycardia s/p AICD placement, atrial fibrillation and severely progressive ALS diagnosed 10 years prior.
- Patient wears continuous positive airway pressure (CPAP) via face mask as needed and at night. PFTs reveal severe restrictive ventilatory impairment with FVC <50% and FEV1 of 50%.
- Presents for open total abdominal hysterectomy due to metastatic ovarian cancer.
 - Anesthetic plan:** Maintain spontaneous ventilation with moderate sedation and place a T10/T11 thoracic epidural.
 - Intraoperatively:** Sedation: dexmedetomidine and propofol infusions. Epidural: 2% lidocaine boluses. Airway: CPAP via face mask.
 - Postoperatively:** Patient tolerated the procedure without obvious pain or respiratory depression and was transferred to the intensive care unit (ICU) for further observation.
- Hospital day 7, she develops a small bowel obstruction with concern for volvulus and is taken for emergent open exploratory laparotomy.
 - Anesthetic plan:** General anesthesia with endotracheal intubation
 - Intraoperatively:** Induction: propofol, rocuronium and fentanyl. Maintenance: propofol infusion, fentanyl as needed.
 - Postoperatively:** Taken to ICU and successfully extubated 14 hours later. She continued to have nausea and vomiting with persistent ileus
- Hospital day 18, she was scheduled for gastrostomy tube placement by interventional radiology for gastric ventilation due to persistent ileus.
 - Anesthetic plan:** Thoracic (T6-8) paravertebral block bilaterally
 - Intraoperatively:** Patient required fluid and pressor boluses for hemodynamic support but did not require sedation or opioids.
 - Postoperatively:** Patient regained bowel function and was discharged to home 10 days after gastrostomy tube placement.

Figure 1



Discussion

- ALS is a rare, progressive neurodegenerative disease that affects both upper and lower motor neurons.
- Variable presentation; symptoms include muscle weakness, muscle fasciculations and atrophy
- Rapidly progressive disease; median survival after diagnosis only 3-5 years
- Cause of death most commonly secondary to complications from respiratory failure
- Data to support the best anesthetic technique and outcomes of various anesthetics for patients with ALS largely presented via case reports; no standard recommended anesthetic for patients with ALS.
- High risk of respiratory depression and aspiration; anesthetic goals: minimizing respiratory depressants, aspiration precautions, avoidance of succinylcholine (risk of hyperkalemia) and cautious use of nondepolarizing neuromuscular blockers.
- At our institution, we routinely perform anesthetics for patients with ALS for placement of gastrostomy tubes. Most commonly use bilateral paravertebral blocks without sedation; generally well tolerated.
- As seen in the flow sheet in Figure 1, we had a unique patient with a complex medical history that presented for 3 different anesthetics. Each of these procedures had different anesthetic requirements and management plans but all similarly had favorable outcomes for the patient.
- Our goals throughout all three anesthetics performed for this single hospitalization were in alignment with the previously mentioned goals. This shows that there is not one single technique that works for every individual ALS patient, but multiple types of anesthetics with similar goals can be safely performed.

References

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