



Beyond the Burn: Understanding Airway Complications in Lightning Strike Victims



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BACKGROUND

- Lightning strikes can deliver up to 10 million volts and temperatures reaching 30,000K, contributing to an estimated 24,000 fatalities worldwide each year¹
- High-voltage injuries can lead to severe respiratory complications such as pulmonary edema, pulmonary contusion, acute respiratory distress syndrome (ARDS), and pulmonary hemorrhage^{2,3}
- Little is known about direct airway injuries from lightning strikes
- Aims:** To present a case of repeated extubation failure following lightning injury and explore potential airway injury mechanisms to guide multidisciplinary care



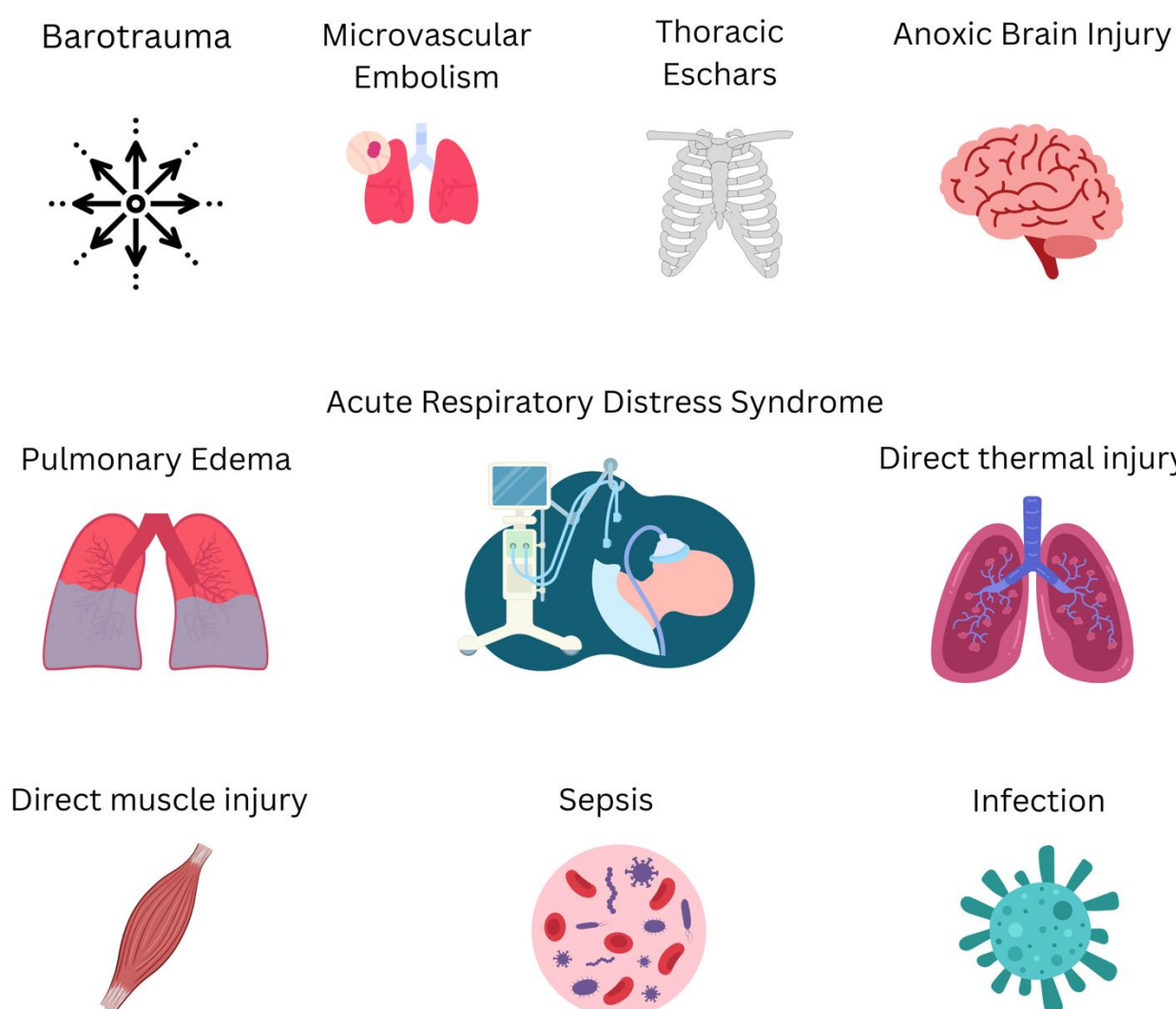
LIGHTNING STRIKE INJURY



Figure 1. Pathway of lightning strike evidenced by dermal injuries and material damage on a patient with darker skin complexion. (A) Initial strike on chest and necklace burn. (B) Path of electricity across right popliteal fossa to right calf. (C) Burn on right lateral foot demonstrating location of electricity exit from patient. (D) Path of grounding across abdomen. (E) Patient's right shoe demonstrating exit point of electricity from foot.

DISCUSSION

What Caused the Repeated Extubation Failures?



Management Considerations⁴

- Improve chest wall compliance (e.g., escharotomies)
- Manage ARDS and optimize fluid/electrolyte balance
- Treat infections and assess airway injury
- Perform tracheostomy if clinically indicated

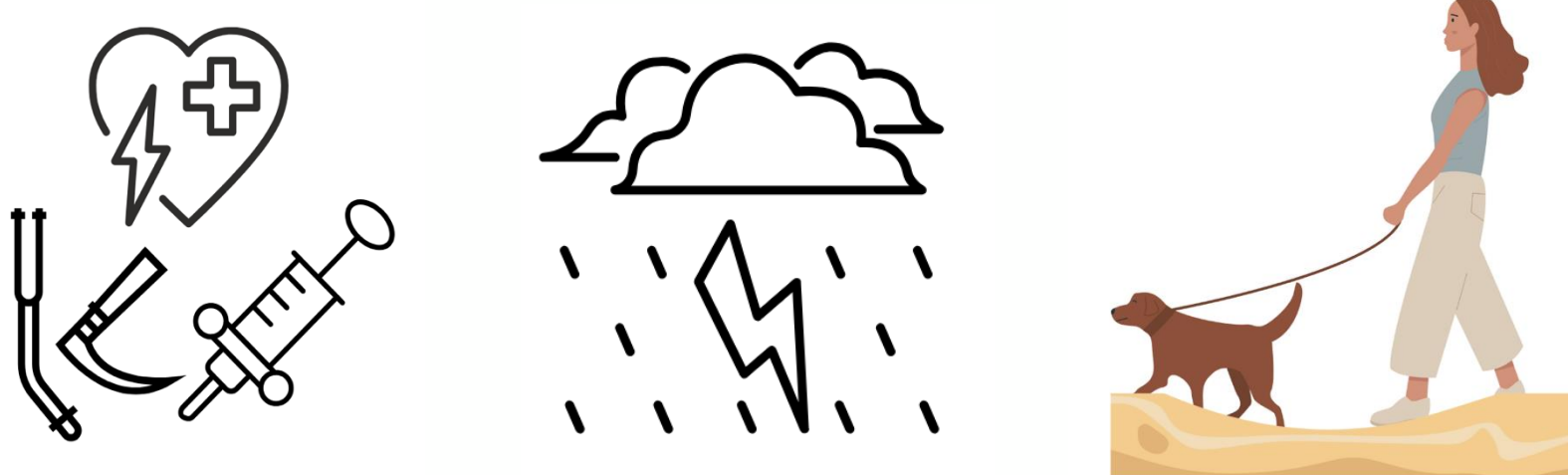
Potential Long-term Complications

- Persistent dysphonia with glottal fry and prolonged hospitalization

CASE REPORT

31-year-old woman struck by lightning:

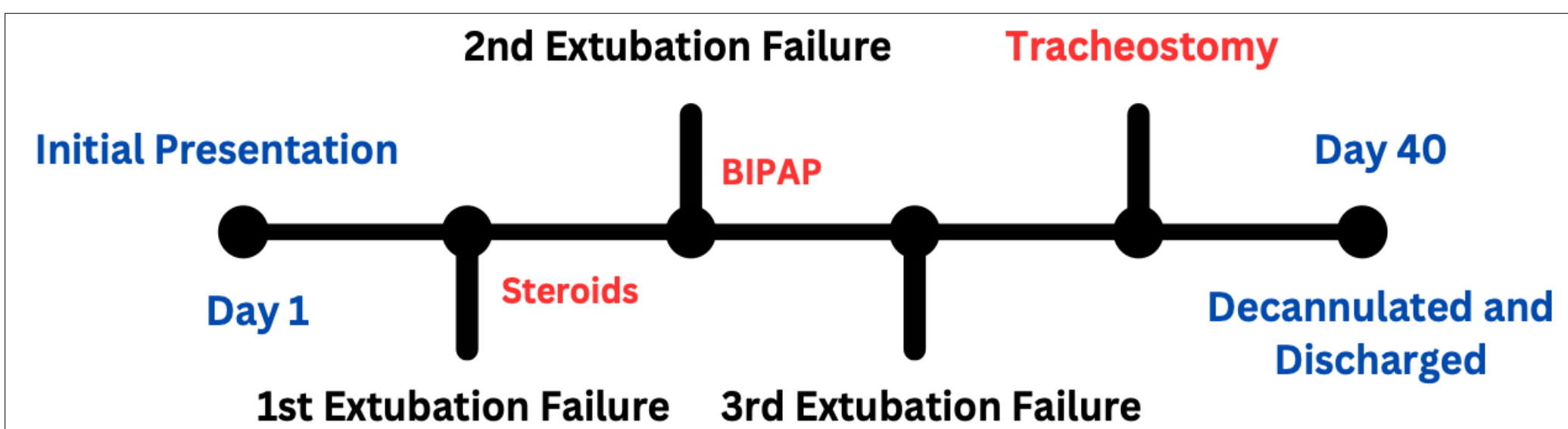
- Following intubation in the field, the patient achieved return of spontaneous circulation and was transported to the hospital
- However, her respiratory function remained compromised as indicated by:
 - Sinus tachycardia
 - Diminished left-sided breath sounds
 - Peripheral cyanosis
 - Copious pink frothy secretions
 - Obstructions from blood clots in the endotracheal tube, requiring its exchange



TREATMENT COURSE

Physical Exam concerning for:

- Multiple burn wounds
- Scalp laceration
- Keraunoparalysis
- Anoxic brain injury



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