

Optimization strategy for the early therapeutic intervention of bronchoalveolar lavage for preventing Mendelson syndrome in a geriatric patient before general anesthesia

ABSTRACT

Aspiration pneumonia is of great concern in the elderly population, often leading to severe respiratory compromise necessitating ventilator support. This case report highlights the critical care and anesthetic management of a geriatric patient with an intertrochanteric fracture presenting with aspiration pneumonia undergoing orthopedic surgery. The patient's clinical presentation and application of therapeutic bronchoalveolar lavage as a novel intervention are discussed. The report outlines the critical care and perioperative management strategies employed to ensure optimal outcomes in this challenging clinical scenario.

Key words: Aspiration pneumonia, bronchoalveolar lavage, hip fractures, Mendelson syndrome, rapid sequence induction and intubation

Introduction

Geriatric patients with multiple comorbidities pose unique challenges to the anesthesiologist, demanding a comprehensive understanding of their medical history and careful consideration of anesthetic strategies. This case report highlights the complexities involved in simultaneous critical care and anesthetic management of an elderly patient with an intertrochanteric fracture presented with aspiration pneumonia.

Mendelson syndrome, first described in 1946, is a potentially life-threatening condition resulting from the aspiration of gastric contents into the lungs.^[1] The elderly population

often afflicted with comorbidities and diminished protective airway reflexes, are particularly susceptible to this syndrome. Early recognition and intervention are crucial to prevent the progression of chemical pneumonitis and associated complications. This case report outlines the successful use of bronchoalveolar lavage (BAL) as an early intervention strategy in an elderly patient presenting with aspiration pneumonia.

Case Presentation


Patient information

An 82-year-old female with a history of bipolar affective

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disorder (BPAD), dementia syndrome, and an old operated intertrochanteric fracture (right) presented with a displaced intertrochanteric fracture (left) sustained following a fall. Given the nature of the fracture, surgical intervention was deemed necessary to achieve proper alignment and facilitate functional recovery.

Clinical presentation

Hours before the surgery, the patient had an episode of vomiting and her clinical condition started deteriorating with decreased mentation and hypoxia requiring incremental oxygen, and impending respiratory compromise. Physical examination revealed coarse crackles and decreased breath sounds in the middle and lower zones of both the lungs, and chest radiography showed evidence of infiltrates consistent with aspiration [Figure 1].

Intervention and management

The complex interplay of comorbidities, including compromised respiratory function and frailty, necessitated urgent transfer to intensive care unit and intubation of trachea by rapid sequence induction (RSI) by administering Inj Glycopyrrolate 0.2 mg IV, Inj Ondansetron 4 mg IV, Inj Fentanyl 1 mg/kg IV, Inj Propofol 1.5 mg/kg IV titrated to effect, Inj Succinylcholine 75 mg IV, and initiation of mechanical ventilation.^[2] Invasive blood pressure monitoring is established by placing an arterial line in the left radial artery.

As there were raised concerns about the potential development of Mendelson syndrome, a decision was made to perform a therapeutic BAL as an adjunctive intervention. The procedure was performed bedside using a flexible bronchoscope. Flexible bronchoscopy revealed evidence of aspirated gastric contents in the middle and lower Bronchi of both lungs [Figure 2a]. Contents were cleared by instilling

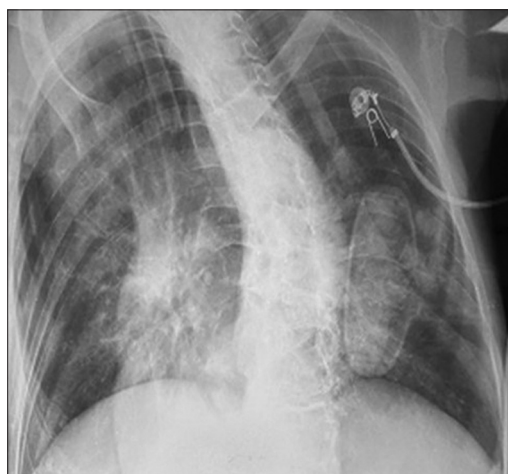


Figure 1: Chest X-ray demonstrating aspiration-consistent infiltrates in the middle and lower zones of both lungs

sequential aliquots of normal saline totaling around 100 ml and the fluid was then aspirated [Figure 2b].^[3] The procedure resulted in significant improvement in lung aeration and oxygenation. The patient was managed with prompt initiation of broad-spectrum antibiotics Inj Piperacillin-Tazobactam 4.5 g IV TDS and Inj Clindamycin 600 mg IV TDS,^[4] Inj Hydrocortisone 100 mg IV BD, Nebulization therapy with Inj Duolin 6 hrly, Inj Magnesium sulfate 500 mg IV 12 hourly, Inj N-Acetylcysteine IV, and sedation with Inj Propofol. Since the patient was on the ventilator, it was decided among the team members to take up the case for surgery after 2 days.

Anesthetic plan

The patient was shifted to the operation theater on the Bains circuit. General anesthesia was planned for this patient. The patient was pre-medicated with Inj Glycopyrrolate 0.2 mg IV, Inj Ondansetron 4 mg IV, and Inj Fentanyl @ 1 mg/kg IV. Induced with Inj Propofol 1.5 mg/kg IV, and neuromuscular blockade achieved with Inj Cis-atracurium @ 0.12 mg/kg IV. Anesthesia was maintained using the inhalational agent Sevoflurane with a target MAC of 1.0.

Intraoperative management

Optimal OT temperature was maintained. Pressure points were adequately padded. Analgesia was provided with Inj Paracetamol 750 mg IV and Inj Diclofenac 50 mg IV. The incision site was infiltrated with 10 ml of 0.25% Inj Bupivacaine. The patient received sedation with careful monitoring of respiratory parameters throughout the procedure. Intraoperative vigilance included close observation of ASA standard monitors (oxygen saturation, end-tidal carbon dioxide levels, IBP, ECG, and temperature) and hemodynamic stability.

Postoperative management

The patient was transferred to ICU and neuromuscular blockade was reversed with Inj Neostigmine @ 50 mcg/kg IV and Inj Glycopyrrolate 10 mcg/kg IV. The trachea was extubated uneventfully after meeting the extubation criteria. Nebulization was given with adrenaline (1:10000). Patient

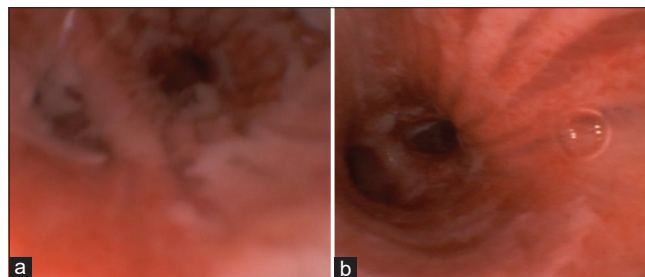


Figure 2: Aspirated stomach contents were found in the middle and lower Bronchi of both lungs during a flexible bronchoscopy (a and b) shows the cleared image of the Bronchi following Bronchoalveolar lavage

remained under observation for 24 hours. Pulmonary function, pain control, and respiratory support were closely monitored. The patient started accepting oral feeds. Early mobilization and pulmonary hygiene measures were implemented to reduce the risk of postoperative pulmonary complications.

Outcome

The early intervention with BAL resulted in the prompt removal of gastric contents from the affected bronchus. Follow-up chest radiography on day 2 and day 4 and clinical monitoring demonstrated resolution of infiltrates [Figure 3] and improvement in the patient's respiratory symptoms. The patient was treated with appropriate antibiotics to manage the concurrent aspiration pneumonia. The patient successfully underwent surgical fixation (internal fixation)^[5] of the intertrochanteric fracture with the chosen anesthetic strategy. Post-operatively, the patient's respiratory status was closely monitored, and appropriate interventions were implemented to manage any respiratory challenges promptly. The multidisciplinary approach, including collaboration between anesthesiologist, pulmonologist, and orthopedic surgeon contributed to a favorable outcome in this challenging case.

Conclusion

This case report underscores the importance of early recognition and intervention in elderly patients at risk for

Mendelson syndrome due to aspiration. Bronchoalveolar lavage emerged as an effective therapeutic strategy to prevent the progression of chemical pneumonitis and associated complications. Timely implementation of BAL in the context of suspected aspiration can significantly improve patient outcomes and reduce the risk of Mendelson syndrome in the vulnerable elderly population. This case underscores the importance of a multidisciplinary approach, early bronchoscopic intervention, and close monitoring in optimizing outcomes for elderly patients at risk for aspiration.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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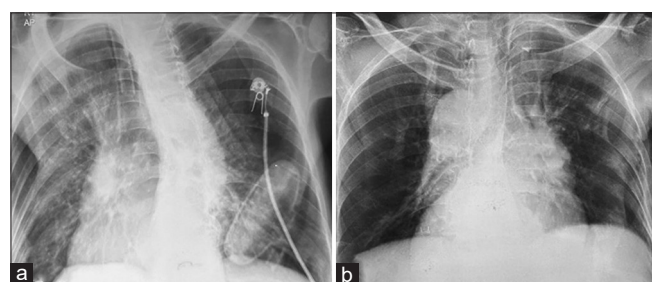


Figure 3: Chest radiography on days 2 and 4 showed clearance of infiltrates (a and b, respectively)