Intra-operative mechanical ventilation in amebic liver abscess surgery: Another paradigm

Sir,

We wish to highlight a hitherto unreported intra-operative complication in a 42-year-old male patient of ruptured amebic liver abscess while undergoing surgery for the chronic empyema. A broncho-hepatic fistula was created probably by the institution of the positive pressure ventilation. Timely lung isolation using the in-situ double lumen tube (DLT) prevented the potentially life-threatening respiratory morbidity. The patient presented with complaints of fever for 1 month, pain in right upper abdomen and chest for 10 days. He had mild hepatomegaly associated with tenderness and guarding over right hypochondrium and decreased breath sounds in the right lower zone of the lung. All blood investigations were within normal limits except high leukocyte count (23,000/mm$^3$) and deranged coagulation (INR of 1.84). The ultrasound of abdomen and subsequent contrast enhanced computed tomography (CECT) showed a large hypoechoic collection measuring 11 cm × 17 cm in the right lobe of the liver, communicating with the right pleural cavity through a 1.3 cm long rent in the diaphragm along with minimal ascites. Ultrasound-guided aspiration from the collection tested positive for *Entamoeba histolytica* [Figure 1]. The patient was initially managed conservatively with antibiotics.

The patient continued to have a cough and on and off fever in spite of antibiotic, hence was scheduled for thoracotomy for nonresolving chronic empyema and ruptured amebic liver abscess. After induction of anesthesia, a left-sided 37 F DLT was inserted in view of the planned thoracotomy for the empyema, and successful lung isolation confirmed by auscultation while the patient was ventilated manually. Mechanical ventilation was initiated at a tidal volume of 8 ml/kg without positive end-expiratory pressure, and the patient positioned in left lateral position with the diseased right lung up.

As soon as the patient was positioned, bilious colored secretions started pouring out from the tracheal lumen. Immediately the bronchial cuff was inflated to avoid the spillage into the healthy...
left lung. The possibility of broncho-hepatic fistula created consequent to the positive pressure mechanical ventilation was suspected, a finding confirmed intra-operatively. The patient maintained SpO\textsubscript{2} of >95% throughout the intra-operative period at FiO\textsubscript{2} of 0.4 and was successfully extubated after the completion of surgery.

*E. histolytica* infection is common in developing countries and intestinal manifestations are its most common presentation. The most common extra-intestinal manifestation is amebic hepatitis including liver abscess, the infection spreading to the liver either by direct extension through the bowel wall, peritoneal cavity, or liver capsule; or indirectly via lymphatic or portal systems.\textsuperscript{[1,2]} Patients with amebic liver abscess may develop pleuropulmonary complications broncho-hepatic fistula which commonly presents as expectoration of a chocolate colored sputum resulting in natural drainage of the liver abscess.\textsuperscript{[3-5]}

The above-mentioned patient had no symptoms suggestive of broncho-hepatic fistula in the preoperative period, nor did the preoperative CECT raise any such suspicion although a chronic empyema was confirmed. On re-examining the CECT postoperatively, it was seen that the ruptured abscess cavity was in close proximity to the bronchus, with only a thin wall and diseased lung separating the two structures [Figure 2]. We hypothesize that initiation of positive pressure ventilation probably led to the creation of a broncho-hepatic fistula by creating a traumatic communication between the two structures through the thin separation. It is more likely that the manual ventilation, rather than mechanical ventilation using lowered tidal volumes and monitored safe airway pressures, led to the creation of a broncho-hepatic fistula. Furthermore, prompt usage of the DLT for lung isolation at this time resulted in salvaging the patient from any further respiratory morbidity and mortality.

Based on these observations, strict use of lung protective ventilation strategy at all times, foregoing manual ventilation even for short interim periods, should be considered in cases of the ruptured amebic liver abscess.

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**Conflicts of interest**
There are no conflicts of interest.

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