

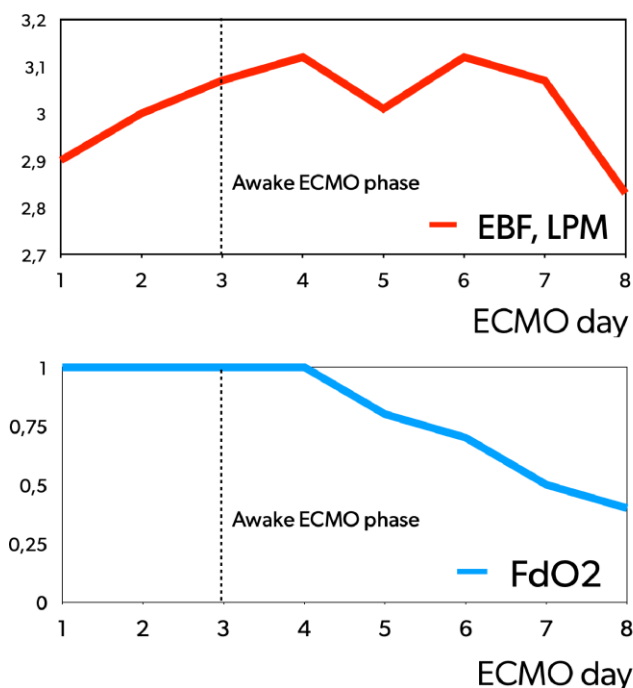
Two birds, one stone: awake extracorporeal life support

Supplementary data

Extracorporeal membrane oxygenation (ECMO) was implemented through a veno-venous (V-V) configuration through a percutaneous femoro-femoral cannulation approach, with the drainage cannula (Venous HLS 29 Fr - Maquet Cardiopulmonary, Rastatt, Germany) inserted in the right femoral vein with distal tip at the level of hepatic veins - inferior vena cava junction, and return cannula (Bio-Medicus™ femoral venous 21 Fr - Medtronic, Minneapolis, MN USA) with distal tip at inferior vena cava - right atrium junction).

A Cardiohelp Heart-Lung support system equipped with a HLS Advanced 7.0 circuit (all Maquet Getinge Group Cardiopulmonary, Rastatt, Germany) extracorporeal circuit was used.

Extracorporeal blood flow was maintained at a median value of 3 (2.8-3.1) liters per minute (LPM) (2.8-3.1) both for initial support and during awake ECMO phase. Main ECMO settings over the run are depicted in graph 1.



Graph 1: Main ECMO settings over the run. A: EBF, extracorporeal blood flow; B: FGF, fresh gas flow; C: FdO₂, fraction of oxygen to the device (in the FGF); LPM: liter per minute; ECMO: extracorporeal membrane oxygenation.

Lung protective ventilation settings

During first days of ECMO run, since initiation and until interruption of muscular paralysis and sedation, the patient was managed with invasive mechanical ventilation (IMV) with volume-controlled strategy:

- respiratory rate (RR) 5 bpm, increased to 15 in the last 12 h before weaning
- positive end expiratory pressure (PEEP) 5 cm H₂O, increased to 7 after 24 h of IMV
- Tidal Volume (V_t) 4-5 ml/kg (based on ideal body weight)
- Fraction of inspired oxygen (FiO₂) 50%

Peak inspiratory pressure was about 20-22 cm H₂O with RR 5 bpm, and increased to 23-24 at 15 bpm.

During weaning phase the patient was shortly managed with assisted spontaneous breathing (PEEP 5 cm H₂O, FiO₂ 50%, pressure support 6 cm H₂O) before weaning to high flow nasal oxygen (40 L/min, FiO₂ 50%).

Supplementary figure legends

Supplementary figure S1: Evolution of tracheal injury (white arrows) and aspiration pneumonia at CT scan:

A/B, first CT at hospital admission: distal end of the endotracheal tube in the main right bronchus (white arrow); retrocarinal pneumomediastinum (black arrow); evidence of basal consolidation in the left lung.

C second CT: large tear involving the posterior tracheal wall extended to the emergence of the main right bronchus; no evidence of pneumomediastinum.

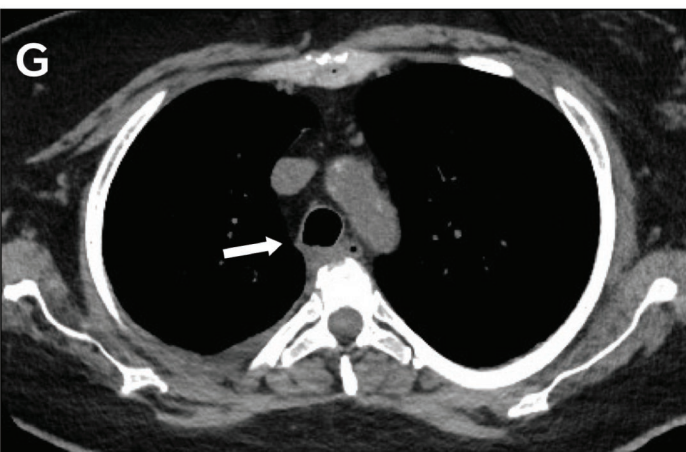
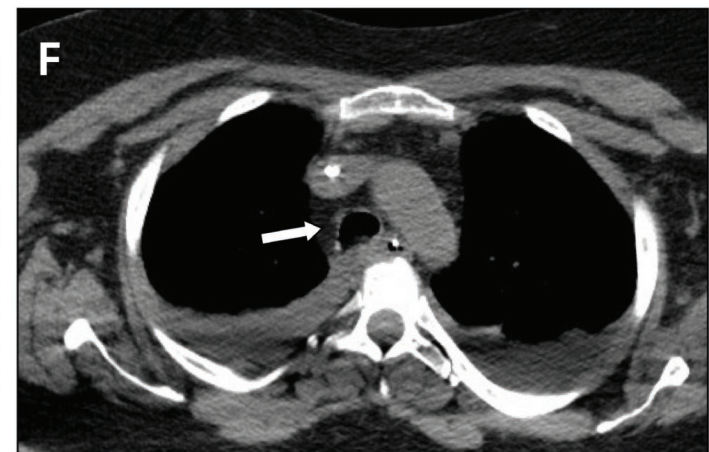
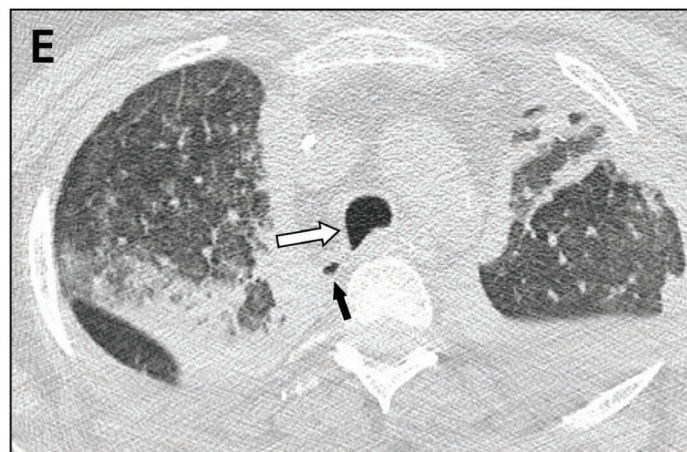
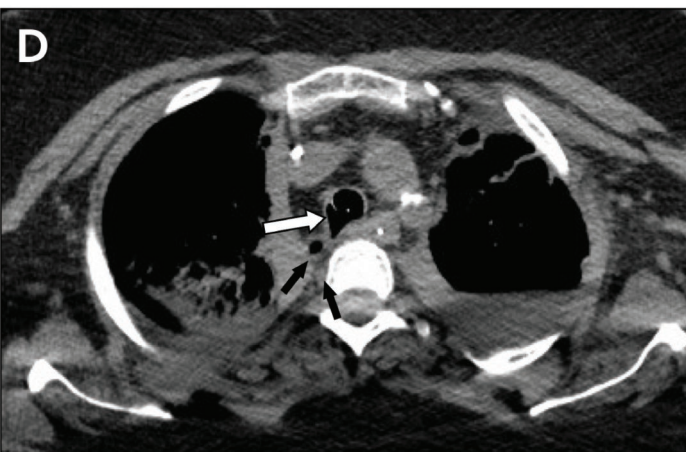
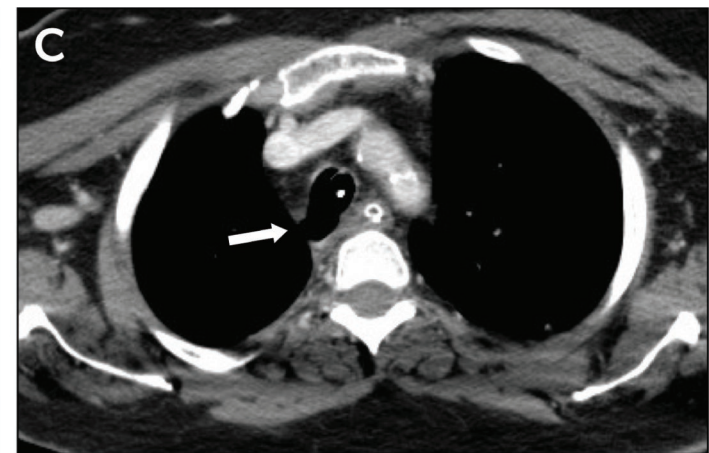
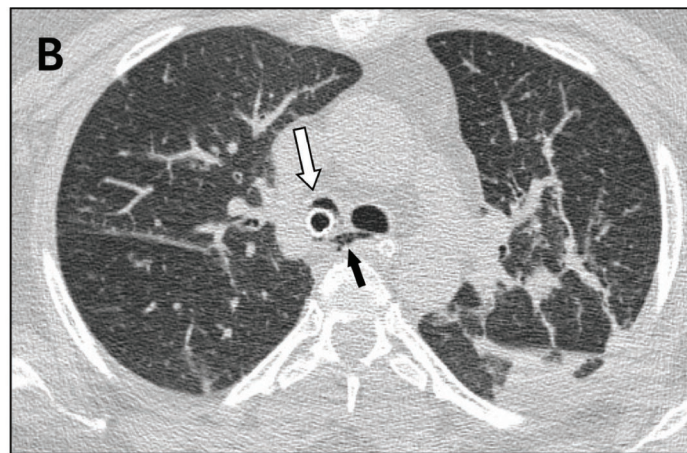
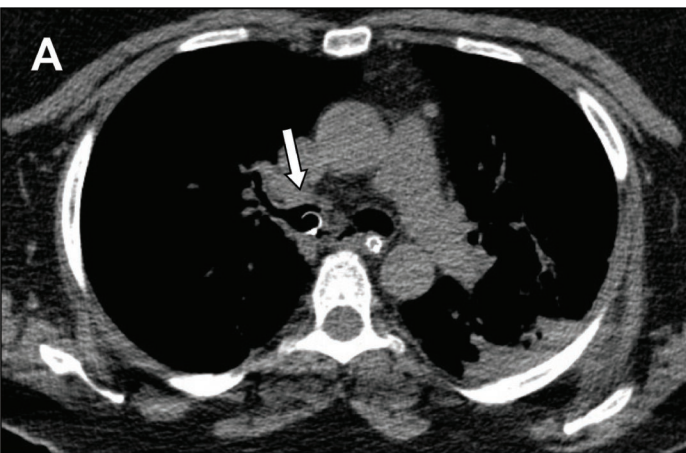
D/E, 3rd CT: decreased extension of the tracheal tear, with a residual mediastinal air bubble (black arrow). Bilateral worsening of lung consolidation, and appearance of "ground glass" and small pleural effusion involving the right lung.

F, 4th CT: partial recovery of tracheal injury, bilateral improvement of lung consolidation.

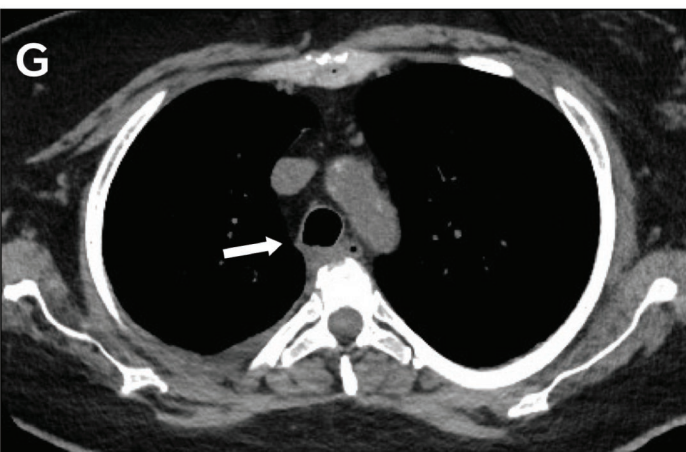
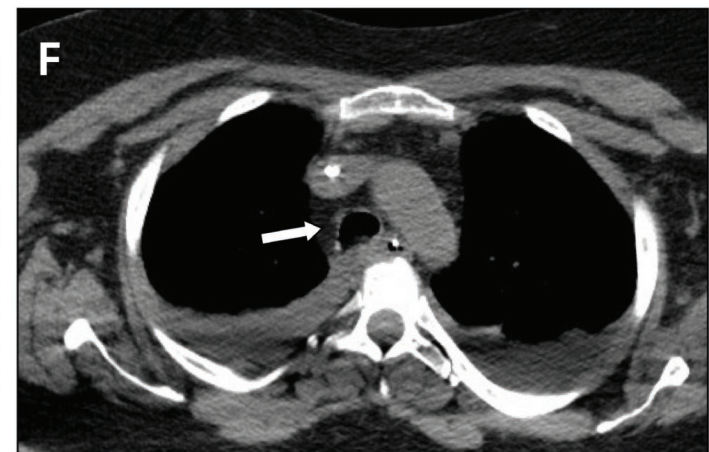
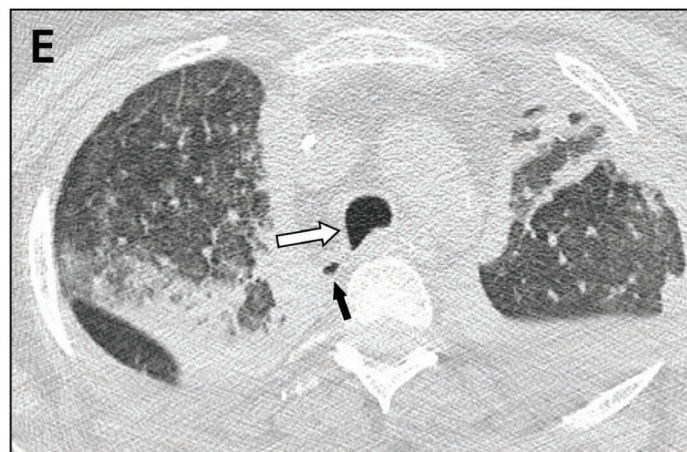
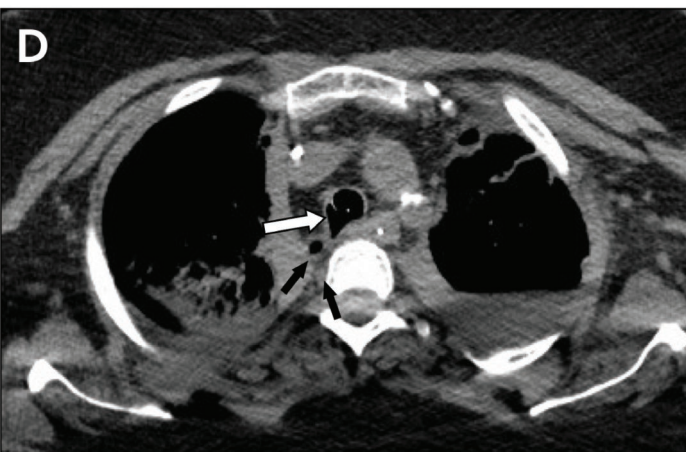
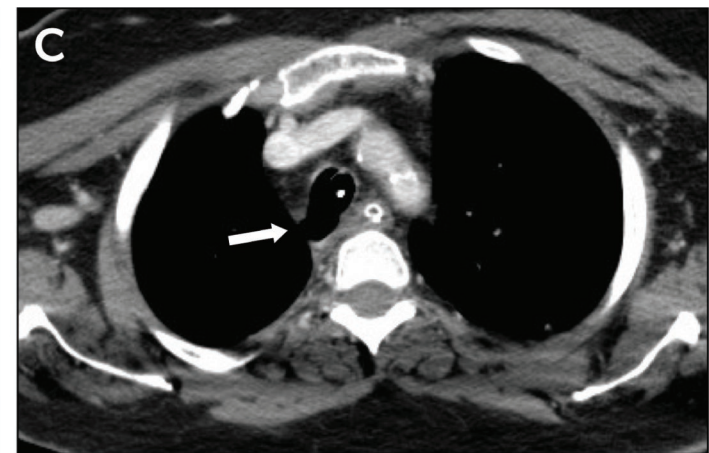
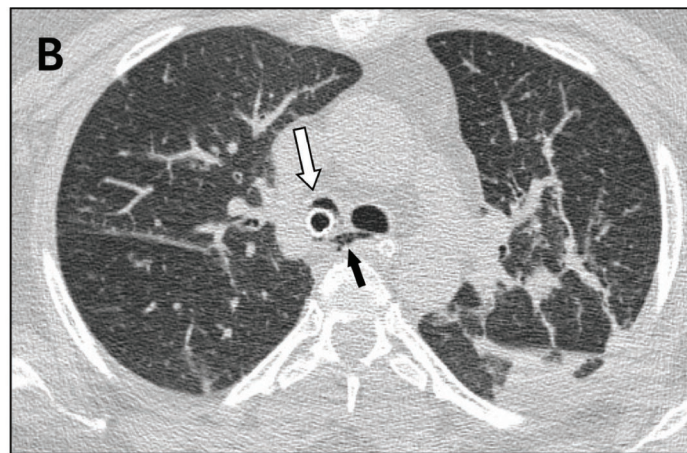
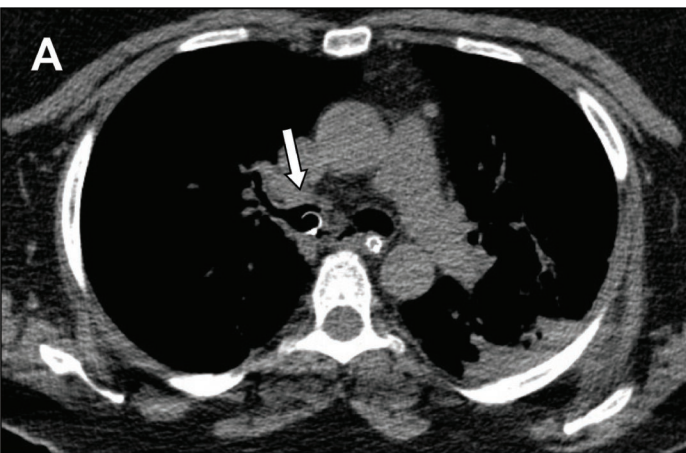
G, last CT: intact tracheal wall, no significant sign of lung disease.

CT: computed tomography.

Supplementary figure S2: Timeline of hospitalization course from admission to discharge; main events and diagnostic procedures are highlighted; days on extracorporeal support highlighted in gradient red. CA: cardiac arrest; CT: computed tomography; FOB: fiberoptic bronchoscopy; ECMO: extracorporeal membrane oxygenation; HFNO: high flow nasal oxygen; ICU: intensive care unit.



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