Introduction:
COVID-19 can cause pulmonary failure and even acute respiratory distress syndrome (ARDS) requiring prolonged mechanical ventilation (MV). It is known that MV by itself comes with complications like superinfections and barotrauma. Since it has been proposed by Gattinoni et al that COVID-19 pneumonia may have two phenotypes, an early one presenting with low elastance and recruitability and the later one with features of ARDS, we evaluated all COVID-19 patients on MV for barotrauma.

Methods:
All patients with COVID-19 pneumonia on MV treated at our intensive care unit (university hospital, ARDS and ECMO reference center) between March and April 2020 were included. Characteristics of MV during the last 24 hours (h) before any complication were recorded. This retrospective registry is covered by an ethics approval (file 234-20).

Results:
A total of 20 patients with COVID-19 pneumonia were included (median age: 61 years, 6 female, duration of MV 22 days, 55% on venovenous extracorporeal membrane oxygenation (vv-ECMO). Of these, 8 patients (median age: 62 years, 3 female, 4 on vv-ECMO) developed barotrauma (40%) including pneumothorax (n=5), pneumomediastinum (n=5) and subcutaneous emphysema (n=2) under MV (Figure 1). Only 1 patient had a predisposing lung disease (chronic obstructive lung disease). Median MV duration before complication occurs was 18 days (range: 1-32). Median MV parameters from all 8 patients during the last 24 h before barotrauma, were: inspiratory oxygen fraction (FiO2) 55% (range: 45-70) peak inspiratory pressure 27mbar (range: 20-29), positive end-expiratory pressure (PEEP) 12 mbar (range: 5-16), tidal volume (VT) 453 ml (range: 41-775), and respiratory frequency (RF) 22/min (range: 15-30), 63% spontaneous breathing, 50% prone positioning.

Conclusion:
In our experience, barotrauma is a frequent complication in the late phase of COVID-19 induced ARDS. Preliminary data suggest that barotrauma in COVID-19 may occur even when following recommendations for lung protective MV in ARDS.
Full-body CT scan showing an extended subcutaneous emphysema, pneumomediastinum and pneumopericard