

Supplemental Digital Content 1

SUPPLEMENTAL MATERIALS AND METHODS

Esophageal catheter positioning and balloon dimensions

Correct positioning of the catheter was obtained using standard software supplied with the ventilator by the manufacturer, which results in centering of the esophageal balloon about 12 cm proximal to the diaphragm. Proper esophageal balloon position was confirmed by the presence of proportionality between deflections in airway pressure (Paw) and Pes during inspiratory efforts against an occlusion¹.

Detailed ventilator settings

Trigger sensitivity was set at 50% change of bias flow (2 L/min) and the inspiration/expiration ratio was set to obtain optimal patient-ventilator interaction based upon visual inspection of ventilator pressure and flow tracings. With pressure support ventilation, trigger sensitivity and rise time were similar as in pressure control ventilation. Inspiratory cycle off was adjusted for each patient based on flow and pressure waveforms to obtain a level where premature and late cycling-off was visually minimal. With neutrally adjusted ventilatory assist, trigger sensitivity was 0.5 μ V above baseline and cycle-off was manufacturer set at 70% of peak electrical activity of the diaphragm.

RESULTS

Breath-stacking caused by reversed triggering was found in selected patients in pressure control ventilation, which can result in increased delivered tidal volume (fig. 1).

References

1. Baydur A, Behrakis PK, Zin WA, Jaeger M, Milic-Emili J: A simple method for assessing the validity of the esophageal balloon technique. *Am Rev Respir Dis* 1982; 126: 788-91

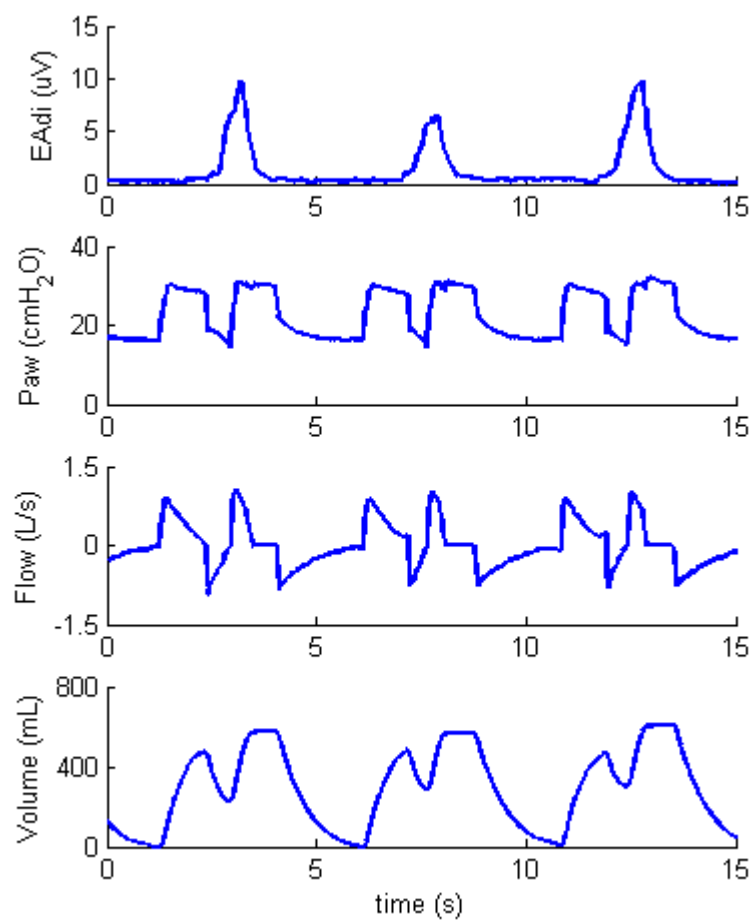


Fig. 1 Breath-stacking caused by reversed triggering in patient #4 during pressure control ventilation. Note the increase in tidal volume during each second patient-triggered breath. EAdi = electrical activity of the diaphragm; Paw = airway pressure; Vt = tidal volume.