

STRATEGIES FOR MANAGEMENT OF PATIENT-VENTILATOR ASYNCHRONY IN A DOG WITH CERVICAL MYELOPATHY



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BACKGROUND

Patient-ventilator asynchrony during assisted mechanical ventilation (MV) is a serious problem associated with prolonged MV, intensive care unit hospitalization and increased mortality in people. A common way to detect asynchronies is by examining ventilator waveforms.

CASE PRESENTATION

A 9 year-old female Rottweiler dog (BW 38 kg) was presented 2 days after cervical (C2-C3) hemilaminectomy for subarachnoid cyst removal with tetraparesis and hypoventilation (PaCO₂ 51 / PaO₂ 67 mmHg) requiring MV. Pressure controlled ventilation (PCV) was initiated and total intravenous anaesthesia with propofol and dexmedetomidine was started. Emergency MRI showed a cervical extradural haematoma requiring spinal cord decompressive surgery. Weaning from MV, 24 hours post-surgery, was unsuccessful and on day 3 a tracheostomy was performed to allow sedative de-escalation and long-term ventilation management.

Once anesthetics were discontinued, consciousness and spontaneous feeding returned. Pressure regulated volume control (PRVC) ventilation was set (Tidal Volume 420 ml, inspiratory flow trigger 2 l/min).

Flow and pressure waveforms analysis showed an auto trigger of 10 l/min due to cardiac oscillations which caused tachypnea. Therefore, asynchrony was corrected by increasing the flow trigger from 2 to 11 l/min. From day 3 to 6, PRVC and pressure support ventilation (PSV) modes (with expiratory trigger optimized from 15 to 40%)

were interchanged ensuring protective ventilation and avoiding respiratory fatigue.

From day 6, PSV and gradually longer periods of invasive CPAP (up to 4 hours) were used and weaning was possible on day 11. The dog was discharged after 1 month with completely recovery of ambulatory functions.

NEW UNIQUE INFORMATION

PRVC is a form of an adaptive pressure assist control ventilation in which tidal volume is used as a feedback control to continuously adjust the pressure limit. This ventilation mode allows patient to start the breath supported by the ventilator avoiding an excessive work of breathing. Auto trigger is a frequent but often unrecognized patient-ventilator asynchrony, associated with ventilator induced diaphragm dysfunction and prolonged ventilation weaning. In the case presented, flow and pressure waveforms were essential to detect asynchronies and optimize the ventilation.

