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BREATHING AGAINST THE ODDS: THE RETURN OF NEGATIVE PRESSURE VENTILATION

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Background: Non-invasive ventilation (NIV) evolved from early negative pressure devices like the “iron lung” during the Polio era to positive pressure ventilators. Home mechanical ventilation services now routinely manage patients needing 24-hour ventilation (continuously ventilated) on positive pressure NIV. Recent advances have introduced less intrusive negative pressure ventilators (NPV), though their role in acute and chronic respiratory failure remains unclear.

Case Report: A 39-year-old male with Motor Neurone Disease (MND) was initially placed on positive pressure NIV to manage symptoms and respiratory failure. While well-tolerated, his condition progressed rapidly, leading to dependence on continuous NIV. His young daughter expressed a wish to see her father without the mask.

Aim: To wean the patient from positive pressure NIV to negative pressure ventilation (NPV) to improve quality of life and meet family wishes.

Methods: The patient was admitted to a sleep laboratory, where positive pressure NIV (Philips Respironics A40) was continued while a biphasic cuirass device (BCV) was applied. Oxygen saturation and tcCO₂ were monitored, and BCV settings were gradually increased while reducing the A40 pressure support.

Results: The patient successfully transitioned to BCV with final settings: Control mode IPAP -22, EPAP 7, BUR 18, I:E 2:1. He tolerated the BCV well and was weaned off NIV, using the BCV intermittently during the day.

Conclusion: Negative Pressure Ventilation via BCV is a viable alternative for patients with chronic respiratory failure. Further studies on NPV devices may expand options for NIV therapy.