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Case report

Insufflation–exsufflation devices in post-operative respiratory failure: Case report[☆]

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ABSTRACT

Introduction: Patients suffering from a neuromuscular disease have a greater likelihood of postoperative respiratory failure. Sometimes, this complication does not respond to non-invasive mechanical ventilation.

Case report: Perioperative management of a patient with Werdnig–Hoffmann disease who underwent bilateral coronoidectomy due to trismus. The postoperative period was hampered by the patient's poor respiratory mechanics, inducing the appearance of atelectasis. Despite the application of preventive non-invasive mechanical ventilation, the patient suffered respiratory failure and required endotracheal intubation. Finally, the respiratory weaning was achieved after the application of insufflation–exsufflation devices associated with non-invasive mechanical ventilation.

Conclusion: The application of insufflations–exsufflation devices in the immediate post-operative period of patients with neuromuscular diseases promotes the proper respiratory evolution of a patient considered impossible to extubate.

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Dispositivos de insuflación–exsuflación en el fracaso respiratorio postoperatorio: informe de caso

RESUMEN

Introducción: El padecimiento de una enfermedad neuromuscular es un factor predictor independiente de insuficiencia respiratoria postoperatoria. Esta complicación en ocasiones no responde al tratamiento con ventilación mecánica no invasiva.

Presentación del caso: Manejo perioperatorio de un paciente con enfermedad de Werdnig–Hoffmann que fue intervenido de coronoidectomía bilateral por trismus. Su evolución postoperatoria se vio dificultada por la mala mecánica respiratoria del paciente que

Palabras clave:

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favoreció la aparición de atelectasias. A pesar de la aplicación de ventilación mecánica no invasiva de forma preventiva, el paciente terminó sufriendo insuficiencia respiratoria y requiriendo intubación orotraqueal. Finalmente se logra el destete respiratorio tras la aplicación de dispositivos de insuflación-exsuflación asociados a la ventilación mecánica no invasiva.

Conclusión: La aplicación de los dispositivos de insuflación-exsuflación en el postoperatorio inmediato de pacientes con enfermedades neuromusculares favorece la adecuada evolución respiratoria de un paciente considerado inicialmente como imposible de extubar.

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Introduction

Non-invasive mechanical ventilation (NIMV) is an effective tool to fight against post-operative respiratory insufficiency. It avoids, in many cases, the need to establish invasive mechanical ventilation (IMV).¹

Suffering from a neuromuscular disease is an independent predictive factor of prolonged post-operative IMV.² The weakness of the respiratory muscles, as well as the decrease in pulmonary volumes and inspiratory capacity, are associated with ineffective coughing. On the other hand, the poor respiratory mechanics of these patients means that their weaning from IMV is considered difficult or even, on some occasions, impossible.³ It has been demonstrated that the use of insufflation-exsufflation devices, like Cough Assist® (JH Emerson Co. Cambridge, MA, USA), increases the efficacy of the coughing, thereby reducing the incidence of post-operative respiratory complications in these patients,² as well as the need of prolonged IMV.³

We present the case of a patient with Werdnig-Hoffmann disease, who suffered from post-operative respiratory insufficiency. It was solved with the combination of NIMV, an insufflation-exsufflation device, and cleaning bronchoscopy.

Clinical case

Patient information

25-year-old male, diagnosed with type 2 Werdnig-Hoffmann disease at fourteen months of age. He suffered difficulties eating orally due to the presence of trismus. As such, he was scheduled for a bilateral coronoidectomy and masseter muscle release.

In terms of antecedents, the patient had been operated when he was 15 years of age for D3-L4 arthrodesis due to paralytic scoliosis. After the intervention, he suffered from a deep femoral thrombosis in the lower right limb secondary to a deficit of factor V Leiden, requiring treatment with oral anticoagulants. Due to the restriction caused by the thoracic deformity, he suffered from symptoms of respiratory insufficiency, which evolved favorably with home-based physiotherapy, without needing NIMV. At 20 years of age, he underwent an atypical apical segmentectomy of the upper lobe of the right lung due to recurrent pneumothorax, without

perioperative incidents. In addition, he was being studied by endocrinology due to severe malnutrition.

Clinical findings

In the physical examination conducted in the anesthetic evaluation, he demonstrated pronounced muscular atrophy, as well as strong retromicrognathia, and mouth opening limitations. As a result, he was classified as having a difficult airway, and it was decided that nasotracheal intubation would be performed with a fibrobronchoscope while the patient was awake, maintaining the spontaneous respiration (Fig. 1). Intubation was difficult, due to the excessively anterior position of the glottis. Then, the patient underwent intravenous induction of anesthesia with 2 mg kg⁻¹ propofol, continuous infusion of remifentanyl (0.05–0.1 mcg kg⁻¹ min⁻¹), and 0.5 mg kg⁻¹ of rocuronium. Intraoperative maintenance was carried out with propofol and remifentanyl in continuous infusion, without needing additional doses of neuromuscular blocking agents.

After finalizing the surgery, the patient was admitted to the Resuscitation Unit to protect the airway during the post-operative period. 24 h after admittance, sedation was



Fig. 1 – Patient with nasotracheal intubation. Source: Authors.

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