Use of supraglottic airway device during non-intubated video-assisted thoracic surgery (NI-VATS) for bilateral sympathectomy: Our experience

Dear Editor,

Non-intubated video-assisted thoracic surgery (NI-VATS) is a combination of non-intubated thoracic surgery (NITS) and video-assisted thoracic surgery (VATS) techniques. Capnothorax is sometime necessary during VATS in case of difficulty in isolation or air trapping. When introduced controlled, capnothorax is useful in compressing the lung on the operative side for surgical manipulation of VATS instruments and tissue exposure.[1] This can become the premise for NI-VATS, where non-intubated surgery (NITS) benefits can blend with those of a minimally invasive technique (VATS). NI-VATS requires less logistical support, is minimally invasive, has a lower risk of laryngeal and tracheobronchial injury and with faster recovery.[2-4]

Recently, we started using the supraglottic airway device (SGD) Ambu® AuraGain™ for VATS bilateral thoracic sympathectomies. The purpose was to utilise the concepts of Enhanced Recovery After Thoracic Surgery (ERATS) in our daycare thoracic procedures. Quite a few rationales exist for this shift from the traditional double-lumen endobronchial tube. These patients are generally young adults with no other comorbidity; the procedure is short and done in the supine position; exchange to a single-lumen endotracheal tube or a double-lumen tube, if required, is easy, and patients are fit to be discharged after a few hours if needed.

We selected three patients in the 20–40 years age group, with body mass index (BMI) <30 kg/m^2, normal airway on assessment and no cardiorespiratory issues. The first patient was a 27-year-old male with a BMI of 24 kg/m^2; the second and third patients were 29- and 27-year-old males with a BMI of 25 kg/m^2 each. After adequate fasting and explained written consent, patients were wheeled into the operating room. Patients were connected to pulse oximetry, a non-invasive blood pressure monitor and an electrocardiogram. An invasive arterial line is not mandatory for VATS sympathectomy surgery.[5] Patients were premedicated with intravenous (IV) fentanyl 1.5 μg/kg, palonosetron 75 μg and dexamethasone 4 mg. After 3 min of preoxygenation with a fraction of inspired concentration of oxygen (FiO_2) 0.8, anaesthesia was induced with IV propofol 1.5 mg/kg and ventilation was controlled with air, oxygen and sevoflurane mixture to achieve a minimal alveolar concentration of 0.7. After IV atracurium 0.5 mg/kg and 3 min of ventilation, an adequate size Ambu® AuraGain™ (Ambu A/S, Ballerup, Denmark) SGD was introduced, and ventilation was checked. The patient was positioned supine head-up (30°) with the arms extended by the side at 90°. Before port placement on each side, FiO_2 was increased to 1 for a few minutes. During the port placement, ventilation was discontinued for a few seconds. Once the VATS camera was introduced through the port, ventilation was started with a higher respiratory rate (18–20 breaths/min) and lower tidal volume (5–6 ml/kg). FiO_2 was titrated to maintain saturation of peripheral oxygen (SpO_2) >94%. The surgeon connected carbon dioxide to the side of the thoracic port, and insufflation was started gradually (1 L/min flow and pressure of 5 mmHg). The patient's vital parameters (blood pressure, heart rate, oxygen saturation, end-tidal carbon dioxide) were closely monitored. As the desired capnothorax was established typically at a pressure of 6 mmHg and flow of 2 L/min, we could visualise the gradual collapse and shift of the ipsilateral lung. Surgeons cauterised the selected ganglion at the appropriate level, generally from the upper border of the third rib to the lower border of the fourth rib. The collapsed lung was gently recruited by closing the adjustable pressure-limiting valve to 20 cmH_2O. Manual positive pressure on the reservoir bag with simultaneous negative suction was applied through the chest drain, which helped to recruit the operated side lung easily. The same steps were then followed on the opposite side. In all three patients, we could successfully manage NI-VATS with the help of SGD. The SGD was removed after the reversal of residual neuromuscular blockade, and patients were shifted to the post-anaesthesia care unit (PACU). None of our patients required oxygen supplementation in the PACU. They were discharged from the hospital on a daycare basis.

Our experience with the three patients highlights the feasibility of using SGD during NI-VATS and their benefits in outpatient procedures, which align with the recommendations of ERATS. The lung parenchyma could be manipulated by the surgeons without the apprehension, pain and discomfort of awake VATS, while avoiding tracheobronchial intubation. As with our technique, a few complications associated with NI-VATS, like hypercarbia, desaturation, and respiratory failure, can be minimised by controlled ventilation. A few limitations of the technique might be in patients with morbid obesity, difficult airway, contralateral diaphragmatic palsy and the presence of pleural adhesions.[6]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, all the patients consented to their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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