Supreme laryngeal mask airway for laparoscopic cholecystectomy in patient with severe pulmonary fibrosis

Editor—We report the anaesthetic management of a patient with severe pulmonary fibrosis for laparoscopic cholecystectomy using a Supreme™ laryngeal mask airway (SLMA). A 50-yr-old, 70 kg male was undergoing elective laparoscopic cholecystectomy for acute cholecystitis. The patient had severe pulmonary fibrosis due to occupational (stone and dust) exposure requiring oxygen therapy at home (Fig. 1). An epidural catheter was introduced in the sitting position at T8/9 intervertebral space with the tip of the catheter advanced 3 cm into the epidural space. A test dose with lidocaine 2% (2 ml) was injected through the catheter. The patient was then placed in the supine position and received a dose of levobupivacaine 0.25% (6 ml). Once sensory block to pinprick at T1 and remifentanil 0.15 µg kg⁻¹ min⁻¹ was administered. After induction of general anaesthesia with propofol 3 mg kg⁻¹ and remifentanil 1 µg kg⁻¹ over 30 s, the patient’s lungs were ventilated using a face mask for 2 min and then a size 4 SLMA was gently positioned at the first attempt. The SLMA cuff was inflated to and maintained at 60 cm H₂O. Oropharyngeal leak pressure was 28 cm H₂O. A flexible fiberoptic bronchoscope introduced through the SLMA confirmed adequate positioning. Ventilation was set to a 40/60 oxygen/air mixture, peak inspiratory pressure of 22 cm H₂O generating an expiratory tidal volume (Vₑ) of 6 ml kg⁻¹, ventilatory frequency of 10 bpm, and inspiratory/expiratory ratio of 1:1, without audible air leaks. Anaesthesia was maintained with infusion of propofol 6 mg kg⁻¹ min⁻¹ and remifentanil 0.15 µg kg⁻¹ min⁻¹. Neuromuscular block was produced using a single bolus of cisatracurium 0.1 mg kg⁻¹ administered at the beginning of surgical procedure. A 14 G Salem gastric tube was easily passed through the drainage tube of the SLMA. During the surgical procedure, pneumoperitoneum was set at an intra-abdominal pressure of 2 kPa. In order to maintain SpO₂ >97% and Vₑ ≥ 6 ml kg⁻¹ during pneumoperitoneum PEEP was increased to 4 cm H₂O without audible air leaks. At the end of uneventful surgical procedure, the patient was transferred to the intensive care unit fully awake, free of nausea and pain, and haemodynamically stable with adequate gas exchange. He was discharged from the hospital on the sixth postoperative day.

Pulmonary fibrosis is characterized by chronic inflammation of the alveolar wall which tends to destroy the lung architecture by consequent healing with progressively severe fibrosis. This leads to an increase in elastance and resistance of the respiratory system, hypoxaemia, and hypercapnia. Owing to the high risk of respiratory complications, regional block with maintenance of spontaneous ventilation is preferable. Laparoscopic cholecystectomy was successfully performed under regional anaesthesia in some patients. However, general anaesthesia remains the best choice to prevent pulmonary aspiration and respiratory embarrassment secondary to pneumoperitoneum. In patients with pulmonary fibrosis, lung protective ventilation is required to obtain the best oxygenation and avoid the risk of barotrauma and lung damage. The laryngeal mask airway (LMA) seems to have advantages over the tracheal tube to reduce respiratory system resistance, and the effectiveness of mechanical ventilation through LMA may be increased by the recourse to pressure-controlled ventilation. Moreover, Proseal™ LMA (PLMA) resulted in smoother emergence from anaesthesia and in lower frequency of postoperative nausea, vomiting, airway morbidity, and analgesic requirements than the tracheal tube. SLMA is a new, single-use, latex-free, LMA™ with gastric access that combines the desirable features of the Fastrach™, Proseal™, and Unique™ LMA devices that may be easily inserted without placing fingers in the patient’s mouth or that do not require an introducer tool for insertion and offers glottic seal pressures similar to the PLMA. Despite the fact that PLMA may be an effective alternative to tracheal

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**Fig 1** Chest X-ray (left) and pulmonary function tests (right) taken on admission in the hospital. The chest X-ray (antero-posterior) showed bilateral fine and coarse reticular pattern, thin-walled cysts (honeycomb lung), and loss of lung volume. Pulmonary function tests (value expressed as percentage of predicted value) showed a marked restrictive pattern with severely reduced gas transfer (breathing air). VC, vital capacity; FVC, forced vital capacity; FEV₁, forced expiratory volume in 1 s; TLC, total lung capacity; DLCO, carbon monoxide diffusing capacity.
intubation for laparoscopic cholecystectomy in non-obese patients,8 the choice of SLMA for the duration of a laparoscopic surgical procedure may be criticized because of the current lack of knowledge regarding the risk of pulmonary aspiration and difficult ventilation. The recourse to SLMA for laparoscopic cholecystectomy using low insufflation pressure of CO₂ (<1.3 kPa) keeps the question open regarding the effectiveness of SLMA during pneumoperitoneum.11 If it is placed correctly and held firmly in position, SLMA performs in a similar way to PLMA in achieving adequate ventilation and protection from pulmonary aspiration.10 11 At the moment, the suggestions are that SLMA should be utilized by experienced users and in selected patients for laparoscopic cholecystectomy.8 11 In our case, SLMA has proved to be effective in a patient with severe pulmonary fibrosis who underwent laparoscopic cholecystectomy.

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doi:10.1093/bja/aep288