

ANESTHETIC CONSIDERATIONS IN PHONOSURGERY

A. F. Kalmar

Dept of Anesthesia and Critical Care Medicine, Maria Middelaers Hospital, Gent, Belgium

Alain.Kalmar@azmmsj.be

SUMMARY

General anesthesia consists of three pillars: hypnosis, analgesia and akinesia, which is obtained by administration of a combination of drugs. After the physiological state of a patient is altered in such a way to securely tolerate a surgical procedure, many homeostatic systems are disturbed profoundly, requiring additional special care to permit safe and complete recovery of all body functions.

Induction of hypnosis results in loss of consciousness and of protective reflexes such as the swallowing reflex and cornea reflex, which mandates measures among other things to protect the airway and eyes.

Induction of analgesia - most profoundly obtained by the administration of opiates - results in inhibition of breathing activity.

Induction of complete akinesia or immobility – even during intense surgical stimulation - results in an absolute inability to breathe or move, requiring mechanical ventilation of the lungs.

The synergistic effects of the administered agents, generally result in a suppression of the cardiovascular system, leading to a decrease in blood pressure and cardiac output. Depending on the comorbidities of the patient, this requires additional supportive interventions to safeguard the perfusion and oxygenation of vulnerable organs such as the brain, heart and kidneys.

A deep sedative state requires protection of the airway, and mechanical ventilation either with a laryngeal mask, endotracheal intubation or jet ventilation.

The optimal strategy varies according to the surgical procedure, and postoperative pain level.

Anesthetic management for phonosurgery has several specific requirements. The vocal cords must obviously be accessible by the surgeon. Specifically the peri-laryngeal region is particularly well innervated. Relatively limited surgical interventions in this region consequently often require more intense perioperative anesthesia and analgesia compared to much larger intervention such as abdominal or orthopedic surgery. On the other hand, phonosurgery has minimal postoperative pain and is mostly performed in day-surgery setting. Since there is only minimal postoperative analgesic need, optimal anesthesia should ensure fast recovery of the patient's consciousness and well-being, allowing swift and safe discharge from the hospital.

This requirement of intense anesthesia and analgesia during the surgical procedure, with fast and complete recovery afterwards demands a choice of drugs with a particular pharmacological profile. The use of a combination of propofol and remifentanyl with their particularly favorable synergistic effects, and the total-intravenous administration is therefore often considered first-choice.

Optimal laryngeal exposure can be accomplished by using dedicated small endotracheal tubes, ultrathin jet-ventilation tubes or mask ventilation with intermittent apnea. Because administration of volatile anesthetics is impractical with jet ventilation, there is an additional benefit for total intravenous anesthesia: the uncoupling of ventilation and administration of hypnotics permits maximal customization of the mechanical ventilation to optimize surgery conditions. This comprises temporary cessation of jet ventilation to minimize motion of the vocal cords or temporary removal of the endotracheal tube for a full view of the larynx.

A particular risk during laser surgery is ignition of endotracheal tube material, surgical drapes or aerosolized tissue, in the oxygen-rich or N₂O-rich ventilation gas. This mandates the decrease of the inspiratory oxygen concentration, the use of dedicated Laser-proof endotracheal tubes, and wrapping of flammable material.

After termination of the surgical procedure, spontaneous ventilation must resume, with complete control of the muscular activity. Specific attention is sometimes required to ascertain sufficient laryngeal control of the free airway.