

Laryngotracheobronchoscopy via Laryngeal Mask Airway in Cats and Small Dogs: A 16-year Experience

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Tracheobronchoscopy in cats and small dogs is conventionally performed without intubation, with a complication rate of 30 % – 40 % and a mortality rate of 5.9 %. Laryngotracheobronchoscopy via laryngeal mask airway (LTBS-LMA) using a flexible bronchoscope provides a constant airway and oxygen supply during examinations from the larynx to the lungs in cats and small dogs and is easy to perform with the animals in supine position. However long-term clinical studies are lacking. This study aimed to assess the practicality and safety of LTBS-LMA in cats and small dogs.

The endobronchial anatomy of dogs in supine position and bronchial distribution on chest X-ray (CXR) were illustrated using four bronchoscopies, a 3D print, and a celluloid cast of the tracheobronchial tree of healthy dogs. Subsequently, the medical records of dogs and cats that underwent LTBS-LMA between 2002 and 2019 were reviewed. Animals were categorized into three groups: cats (F), small dogs (S, < 5 kg), and medium-to-large dogs (ML, > 5 kg). Indications and LTBS-LMA procedure outcomes were compared between groups using descriptive statistics and the chi-squared test.

Altogether, 820 LTBS-LMAs in 572 cases (436 dogs, 136 cats) were included. The most common indications were abnormal CXR findings, chronic cough, and chronic dyspnea in F; and abnormal CXR findings, stridor, and chronic cough in the S and ML groups. LTBS-LMAs were performed in 212, 325, and 283 times in the F, S, and ML groups, respectively, with 90% of the animals in supine position. In the F, S, and ML groups, brushing was performed in 153, 234, and 130; biopsy (laryngeal, $n = 58$; tracheal, $n = 33$; and bronchial, $n = 39$) in 55, 34, and 28; transbronchial lung biopsy in 23, 2, and 11; and bronchoalveolar lavage in 86, 139, and 127 LTBS-LMAs, respectively. Endoscopic interventions included stenting in 51, argon plasma coagulation in 46, debulking in 21, balloon dilation in 9, foreign body removal in 6, and snare resection in 6 LTBS-LMAs. The complication rates were 20.8 %, 7.7 %, and 4.6 %; the mortality rates were 3.8 %, 0.9 %, and 1.1 %, in the F, S, and ML groups, respectively. The mortality rate in cats decreased significantly ($p < 0.01$) from 25.0 % (3/12) in the initial 2-year period to 2.5 % (5/200) in the 14-year period after defining a candidate criterion of requiring a partial pressure of oxygen in arterial blood >

60 mmHg in room air.

LTBS-LMA provided endoscopic examinations and interventions from the larynx to the lungs in cats and small dogs with comparable practicality and safety to those in medium and large dogs.