

Laryngotracheobronchoscopy via laryngeal mask airway in dogs and cats: A 16-year experience

Y. Shiroshita, T. Suganuma, T. Sakurai, K. Mamada, K. Inaba, S. Kusaba. Veterinary Respiratory Medicine and Surgery Study Group, Kanagawa, Japan.

Bronchoscopy in cats and small dogs has been undergone without intubation, with a complication rate of 30%–40%. Laryngotracheobronchoscopy via laryngeal mask airway (LTBS-LMA) provides constant airway and oxygen supply during examinations of cats and small dogs from the larynx to the lungs and may be easy to perform in the spine position. However, long-term clinical studies are lacking. The present study aimed to describe the clinical application in LTBS-LMA in small animals.

We elucidated intrathoracic tracheobronchial anatomy in the spine position and bronchial distribution on chest-X-ray (CXR), using four normal-dog bronchoscopies, and a 3D printing and a celluloid cast of tracheobronchial tree of normal dogs. Subsequently, medical records of 572 cases (dogs, 436; cats, 136; 820 procedures in total) that underwent LTBS-LMA between 2002 and 2019 were reviewed. LTBS-LMA was performed under general anesthesia, using flexible bronchoscopes with an outer diameter of 2.5-6.0mm, in order of endoscopic observation, brushing, biopsy, transbronchial lung biopsy, and bronchoalveolar lavage, based on the former study. Three groups were defined—cat (F), small dog (S; <5 kg bodyweight), and moderate-to-large dog (ML; >5 kg bodyweight). Complications rates were compared among the groups using the chi-square test.

Primary indications were abnormal CXR findings, 152; chronic cough, 82; chronic dyspnea, 58 in F; abnormal CXR findings, 174; strider, 98; chronic cough, 94 in S; abnormal CXR findings, 209; chronic cough, 148; strider, 70 in ML. LTBS-LMAs were performed in 212, 325, and 283 procedures in F, S, and ML groups, respectively, mostly in the spine position (F, 205; S, 300; ML, 249). In the F, S, and ML groups, brushing was performed in 153, 234, and 130 procedures, biopsy (laryngeal, 58; tracheal, 33; bronchial, 39) in 55, 34, and 28, transbronchial lung biopsy in 23, 2, and 11, bronchoalveolar lavage in 86, 139, and 127, respectively, with no differences among the groups. Endoscopic interventions were debulking in 21 procedures, stenting in 51, foreign body removal in 6, balloon dilation in 9, snare resection in 6, and argon plasma coagulation in 46. The complication rate (oxygen saturation < 90%, 49; tachypnea after LTBS-LMA, 13; bleeding, 11; pneumothorax, 5; transient apnea, 2; lung collapse, 2) was 10.0% (82/820). The mortality rate was 1.7% (dogs, 7; cats, 7). After setting the candidate criteria of a partial pressure of oxygen in arterial blood > 60 mmHg in room air, the mortality rate significantly decreased from 13.6% to 1.4% in the later 14-year period compared to the early 2-year period ($p < 0.01$).

LTBS-LMA enables safe endoscopic examinations and interventions from the larynx to the lungs in cats and small dogs. Patient assessment and owner information prior to LTBS-LMA are essential.