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**AN EVALUATION OF THE
EFFECTIVENESS OF
CASTELLATED LARYNGOFISSURE
AND BILATERAL
ARYTENOID LATERALISATION
FOR THE RELIEF OF LARYNGEAL
PARALYSIS IN DOGS**

**A Thesis presented for
The Degree of Master of Veterinary Science
at Massey University**

by

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1989

ACKNOWLEDGEMENTS

Funds for this work were provided by the Massey University Research Fund, Auckland Veterinary Society and New Zealand Veterinary Association.

Thanks are due to many people for their assistance during this study.

The technicians of the Department of Veterinary Clinical Science for their help in caring for the dogs during their stay at Massey University.

Dr A.M. Alexander for providing accommodation for the dogs.

Mr J. Pedley for his technical assistance.

Mr T. Law for the photographs.

Mr K. Korndorffer for the graphic work.

Mrs L.K. Fecser for typing the drafts and final manuscript.

I am especially grateful to my supervisors:

Mr B. Jones for his help with funds, literature and interest.

Dr D.H. Carr for his assistance in obtaining the tidal breathing flow-volume loop data.
and in particular:

Dr B.E. Goulden for his support throughout this project and his persistence in channelling my enthusiasm down the path of logical thought.

The help of all these people I acknowledge with gratitude.

ABSTRACT

In recent years, laryngeal paralysis in dogs, has become a frequently recognised disorder. Various surgical procedures have been advocated to relieve the consequential laryngeal obstruction, but few critical examinations of the effectiveness of these procedures have been attempted. The aim of this study was to determine and compare the efficacy of two of the more commonly used surgical methods (i) castellated laryngofissure with vocal fold resection and (ii) bilateral arytenoid lateralisation in providing an adequate laryngeal airway in dogs after surgically induced laryngeal paralysis.

The laryngeal function of ten adult healthy experimental dogs was assessed by clinical examination, laryngoscopy, blood gas and tidal breathing flow-volume loop analyses prior to and after bilateral recurrent laryngeal nerve resection. Five dogs then underwent a castellated laryngofissure with vocal fold resection and the remaining five, bilateral arytenoid lateralisation. Six weeks later, the laryngeal function of the ten dogs was reassessed using the same investigative techniques. Radiographs of the chest were taken at the start and completion of the experiment on the live dogs to help detect the presence of any co-existent lower respiratory tract disease. An autopsy was performed on each dog, six weeks after surgery, and details of visible changes in the laryngeal structure recorded.

After neurectomy, all of the dogs had inspiratory stridor, a hoarse bark and reduced exercise tolerance. Medial displacement of the arytenoid cartilages and vocal cords caused narrowing of the *rima glottidis*. No abduction of these structures occurred during inspiration. There was a significant fall in arterial oxygen tension and inspiratory airflow recorded on blood gas analyses and tidal breathing flow-volume loop studies, respectively.

The degree of relief from the laryngeal obstruction in the neurectomised dogs after castellated laryngofissure with vocal fold resection was variable. Some of the animals still had signs of respiratory embarrassment. The size of the *rima glottidis* achieved was either slightly narrower or similar to that seen in the non-abducted, pre-neurectomised larynx of the experimental dogs. No significant improvement in blood gas or tidal breathing flow-volume loop analyses were recorded following the surgical technique.

In contrast, bilateral arytenoid lateralisation consistently alleviated the clinical signs of bilateral recurrent laryngeal neurectomy. The *rima glottidis* width was increased to either the non-abducted, pre-neurectomised size or greater, depending on the position of the lateralisation suture. Furthermore, blood gas and tidal breathing flow-volume analyses recorded a significant increase in arterial oxygen tension and inspiratory airflow, respectively.

Although bilateral arytenoid lateralisation was more efficient than castellated laryngofissure with vocal fold resection in alleviating the laryngeal obstruction caused by bilateral recurrent laryngeal neurectomy, it did have some inadequacies. The fixed abduction of the arytenoid cartilages destroyed the expiratory braking mechanism of the larynx. Furthermore, execution of the surgical technique requires intimate knowledge of the anatomy of the larynx and the surrounding structures and, since the position of the lateralisation suture is important, best results are likely to be achieved by surgeons experienced with the procedure.

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