

THE LARYNGEAL PARALYSIS TRIFECTA (LARYNX, ESOPHAGUS, REARLIMBS):

Perioperative Management of the
Geriatric Onset Laryngeal Paralysis Polyneuropathy Patient

**Synopsis--**

Geriatric Onset Laryngeal Paralysis Polyneuropathy (GOLPP) has three common components,

- 1) laryngeal paralysis,**
- 2) a flabby esophagus** (just short of true megaesophagus), and
- 3) rearlimb weakness** (most often misdiagnosed as generic “arthritis”).

It is also most commonly seen in geriatric dogs with a myriad of other chronic, unrelated problems to consider and accommodate.

The most common trigger for respiratory crisis for dogs with Laryngeal Paralysis is excitement. Travel to the vet is a big, big trigger! Knowing this, we can plan ahead with the family and prepare for arrival at the clinic. Having a back-up plan when a respiratory crisis does occur makes for a smoother patient management experience for everyone!

The most common time for the major tieback complication—*aspiration pneumonitis/pneumonia*—to happen is in-and-around the anesthetic episode. For this reason, careful and systematic preparations for this period are beneficial to a successful outcome.

This uptick in risk in-and-around anesthesia is related to several factors—a) anesthetic drugs inhibiting lower esophageal sphincter tone, b) poorly controlled airway and swallowing, c) increased abdominal pressure during patient handling, carrying, manipulation under anesthesia. These are all circumstances we can modulate with specific planning before, during and after a tieback surgery.

Most of these Laryngeal Paralysis patients are geriatric and commonly experience some degree of anxiety when separated from their owners and while in uncommon surroundings. This factor adds to the preoperative risk of respiratory crisis and increases the postoperative concern for regurgitation and surgical failure (from barking!) A few modifications to how we schedule our procedure and manage our clients during the visit can dramatically ease these anxiety-related concerns. These geriatric dogs often have other (unrelated) chronic maladies that we can acknowledge and support such that we don't make them worse with our surgical efforts toward improving their airways.

Planning Protocol for Laryngeal Paralysis Cases**PRE-OPERATIVELY**

- 1) Prescribe pre-operative promotility medications for *3-5 days pre-op* (Cisapride, Ranitidine, low dose Erythromycin or Metaclopramide, *in order of preference*) **Compounding pharmacy may be required; plan ahead.

(WHY? POOR ESOPHAGEAL FUNCTION ASSOCIATED WITH GOLPP PREDISPOSES TO SILENT REGURGITATION AND INCREASED RISK OF ASPIRATION; MAINTAINING A STOMACH EMPTY OF FLUID IS IDEAL DURING THE ANESTHETIC EPISODE.)

- 2) Schedule surgery day to include **only a brief pre-op** hospital experience and **early discharge** appointment (total hospital time approximately 2 hours).

(WHY? ANXIETY AND STRESS ARE COMMON IN GERIATRIC PATIENTS AND BOTH SNOWBALL INTO OTHER PATIENT MANAGEMENT PROBLEMS.)

- 3) Consider doing preanesthetic and disease work up **prior to day of surgery**.

(WHY? GERIATRIC PATIENTS OFTEN HAVE ABNORMALITIES THAT NEED DECISIONS AND/OR TREATMENT, AND AT THE VERY LEAST, A CLIENT DISCUSSION.)

- 4) **Strongly consider Trazadone** for pre-op travel, testing dose before day of surgery).

(WHY? TRAVEL IS A BIG TRIGGER FOR A BREATHING CRISIS; SOOTHING THE TRAVEL ANXIETY MIGHT PREVENT OR REDUCE THE SEVERITY OF THIS CHALLENGE.)

- 5) Advise and/or **Rx systemic antacids** x 7d preop (only if compounded Ranitidine is not being used for motility; famotidine, omeprazole – *no preference*)

(WHY? THE TIME IN & AROUND ANESTHESIA IS WHEN SILENT/OVERT REGURGITATION USUALLY HAPPENS; EVEN WITH ALL OF THE SPECIAL PREPARATIONS THIS MAY OCCUR. IF WE CAN KEEP THE GASTRIC PH HIGHER THAN TYPICAL, THE REGURGITATED AND POTENTIALLY ASPIRATED GASTRIC CONTENTS WILL NOT BE AS CAUSTIC TO THE LUNGS.)

- 6) **Avoid** acepromazine and steroids when possible.

(WHY? PATIENTS TRANQUILIZED WITH ACEPROMAZINE SEEM TO BE AT INCREASED RISK OF SILENT REGURGITATION. STEROIDS DECREASE GASTRIC PH, INCREASE PANTING AND ANXIETY, AND CHALLENGE THE IMMUNE SYSTEM; ALL ARE COUNTERPRODUCTIVE IN PERIOPERATIVE PATIENTS. INHALED STEROIDS MAY BE BENEFICIAL TO REDUCE/CONTROL LARYNGEAL EDEMA ASSOCIATED WITH MORE ADVANCED PARALYSIS.)

DAY OF SURGERY

- 1) **Low-stress patient handling** is absolutely required, utilizing the owner as much as feasible. Avoid traditional head and neck restraint.

(WHY? DOGS WHO CANNOT BREATHE WELL WILL FIGHT HEAD/NECK RESTRAINT, MAKING THEIR BREATHING EFFORTS MORE LABORED. ANXIETY OF SEPARATION WILL MAKE RESTRAINT MORE NECESSARY AND MAKE BREATHING EFFORTS MORE LABORED. THE GOAL IS TO SNEAK THESE PATIENTS INTO ANESTHESIA WITHOUT THEM NOTICING!)

- 2) Admit appointment scheduled **no more than 30-45 mins prior** to surgery start time.

(WHY? A LONG WAIT PRIOR TO SURGERY WILL COMPOUND THE PATIENT'S STRESS AND ANXIETY AND INCREASE THE RISK OF BREATHING CRISIS.)

- 3) Place **catheter early** for emergency access.

(WHY? INDUCING ANESTHESIA IN AN URGENT MANNER MAY BE NECESSARY AND UNPREDICTABLE.)

- 4) **Administer** Metaclopramide, Famotidine, and Maropitant by injection.

(WHY? THE METACLOPROMIDE WILL KEEP FLUIDS MOVING OUT OF THE STOMACH TO PREVENT SILENT REGURGITATION. FAMOTADINE WILL REDUCE THE ACID LOAD OF STOMACH CONTENTS SUCH THAT IF REGURGITATED AND ASPIRATED, THE RESULTANT PNEUMONITIS/PNEUMONIA WILL NOT BE AS SEVERE. THE MAROPITANT WILL OFFSET ANY PHARMACOLOGICAL NAUSEA THAT MAY RESULT FROM ANESTHESIA.)

5) Prepare the following anesthesia drugs:

a. **Propofol** 4mg/kg

(WHY? RAPID INDUCTION WITH MINIMAL INHIBITION OF MOTOR FUNCTION TO THE LARYNGEAL MUSCLES; REASONABLY SAFE FOR GERIATRIC POPULATION.)

b. **Buprenorphine** 0.01mg/kg, or **Hydromorphone** 0.05mg/kg, or Morphine 0.5mg/kg, or **Butorphanol** 0.4mg/kg

(WHY? LOW TO MIDDLE DOSE ANALGESIC TO BE USED AFTER INDUCTION TO ELIMINATE VOMITING CONCERN AND AVOID INHIBITION OF MOTOR FUNCTION TO THE LARYNGEAL MUSCLES.)

c. **Midazolam** 0.05mg/kg

(WHY? TO BE USED AFTER INDUCTION FOR STRESS-REDUCING DURING RECOVERY AND ANESTHETIC-SPARING DURING MAINTENANCE.)

6) If the patient is **stable**, **wait** for surgeon to participate in induction.

(WHY? IDEALLY, A LIGHT ANESTHESIA UNDER IV PROPOFOL PROVIDES THE BEST EXAM PARAMETERS FOR DIAGNOSING LARYNGEAL PARALYSIS.)

7) In case of **emergency respiratory distress** upon arrival, place catheter and administer Midazolam 0.05mg/kg and Hydromorphone 0.01mg/kg (or Butorphanol 0.1mg/kg) IV slowly; use increments of the same medications as needed. If necessary, secure airway with Propofol induction and maintain until surgery time.

(WHY? LIGHT IV SEDATION MIGHT BE ENOUGH TO STOP A BREATHING CRISIS AND STILL ALLOW ACCURATE LARYNGEAL EXAM. PATIENT SAFETY IS MORE IMPORTANT THAN A PREOP LARYNGEAL EXAM; AN INTUBATED/ANESTHETIZED PATIENT CAN WAIT SAFELY FOR SURGICAL INTERVENTION.)

8) Oxygen therapy as tolerated using **blow-by only**. No head restraint and no mask delivery.

(WHY? MOST PATIENT DYSPNEA IS BEING PHYSIOLOGICALLY DRIVEN BY ELEVATED CO₂ (NOT LOW OXYGEN), SO A "FIGHT" TO PROVIDE OXYGEN BY MASK IS NOT HELPFUL. FOR THOSE BEING PHYSIOLOGICALLY DRIVEN BY LOW OXYGEN LEVELS, THE DISTRESS IS GREAT ENOUGH TO RECOMMEND MOVING TO INDUCTION/INTUBATION DIRECTLY.)

9) **When moving the anesthetized patient**, support the body by the skeletal structures only, i.e. do not sling them by the abdomen.

(WHY? REGURGITATION WITH RESULTANT ASPIRATION PNEUMONIA IS THE MOST DANGEROUS COMPLICATION FOR THESE PATIENTS. APPLYING PRESSURE TO THEIR ABDOMEN WILL INCREASE THE CHANCES OF REGURGITATION OF STOMACH CONTENTS UP INTO THE ESOPHAGUS AND THEN TO THE LARYNX AND/OR TRACHEA.)

10) **When moving the anesthetized patient**, maintain the head at a level higher than the abdomen, i.e. carry at an incline.

(WHY? ANOTHER REGURGITATION PREVENTION TECHNIQUE, THIS PREVENTS GRAVITY FROM ACTING ON STOMACH FLUIDS AND MOVING THEM UP THE ESOPHAGUS TO FALL INTO THE TRACHEA.)

- 11) **When moving and positioning** the patient before/during/after anesthesia, avoid hard surfaces, rough handling and awkward body positions.

(WHY? REMEMBER THAT THESE ARE GERIATRIC PATIENTS WITH LESS BODY PADDING AND WEAKER BACKS, WHO ARE EASIER TO BRUISE, AND LESS RESILIENT TO ANY PHYSICAL INSULT WE PUT TO THEM.)

DISCHARGING PATIENT

- 1) Plan for owner pick up typically within an hour of surgery.

(WHY? PATIENT ANXIETY IS TO BE AVOIDED TO PREVENT STRESS ON REPAIR AND THE NEED FOR FURTHER SEDATION (WHICH PREDISPOSES TO REGURGITATION/ASPIRATION. WHEN THEY HAVE THEIR FEET UNDER THEM, THEY ARE BETTER MANAGED IN A STRESS-FREE, HOME ENVIRONMENT.)

- 2) Go home meds:

- a. Gabapentin or Tramadol

(WHY? USEFUL FOR LIGHT SEDATION POSTOP AND MAYBE SOME PAIN RELIEVING QUALITIES.)

- b. NSAIDs (half maintenance dose x 7days or continue chronic Rx)

(WHY? GASTRITIS IS TO BE AVOIDED AT ALL COSTS WITH THE GOAL OF PREVENTING REGURGITATION OR VOMITING; NSAIDS MAY CAUSE GASTRITIS. SURGERY IS RELATIVELY LOW INSULT, SO MAY NOT NEED HIGHER DOSES. DOGS WITH CHRONIC USE OF NSAIDS AND NO VOMITING/REGURGITATION ARE A KNOWN LOW RISK WITH NSAIDS USE.)

- c. Proton pump inhibitor medication x 2 months trial, then **refills for lifelong use** of successful medication (Cisapride, Ranitidine, low dose Erythromycin or Metaclopramide - *in order of preference*). (WHY? GASTRIC MOTILITY DRUGS WILL KEEP THE STOMACH RELATIVELY MORE EMPTY OF GASTRIC FLUIDS. WE DON'T HAVE ANY GOOD DRUGS TO HELP A FLABBY ESOPHAGUS OR WEAK LOWER ESOPHAGEAL SPHINCTER. TRIALING THESE DRUGS, ONE AT A TIME, TO FIND THE ONE THAT WORKS THE BEST TO PREVENT SILENT REGURGITATION IS ADVISED.)

- d. **Systemic antacids** x 7d postop (only if compounded Ranitidine is not being used for motility; famotidine, omeprazole – *no preference*)

(WHY? THE TIME IN & AROUND ANESTHESIA IS WHEN SILENT/OVERT REGURGITATION USUALLY HAPPENS; EVEN WITH ALL OF THE SPECIAL PREPARATIONS THIS MAY OCCUR. IF WE CAN KEEP THE GASTRIC PH HIGHER THAN TYPICAL, THE REGURGITATED AND POTENTIALLY ASPIRATED GASTRIC CONTENTS WILL NOT BE AS CAUSTIC TO THE AIRWAYS AND LUNGS. NOT TO BE ROUTINELY USED LONGTERM; THERE IS SOME EVIDENCE IN HUMANS TO SUPPORT THAT A LOWER PH TIGHTENS THE LOWER ESOPHAGEAL SPHINCTER, WHICH IS BENEFICIAL.)

- 3) Lifelong use of one of the promotility medications is recommended.

(WHY? THE POLYNEUROPATHY CREATING THIS CONDITION WILL CONTINUE TO WEAKEN THE ESOPHAGUS; ONGOING USE OF MOTILITY DRUGS WILL HELP PREVENT THE HEARTBURN AND INCREASED ASPIRATION RISK THESE DOGS FACE POSTOP. CLIENTS MUST BE ALERT TO MONITORING THE DRUG EFFECTIVENESS LIFELONG AND REPORT WHEN IT IS NOT WORKING WELL, SO A SWITCH CAN BE MADE.)

Lara Rasmussen, DVM, MS

Diplomate, American College of Veterinary Surgery

DIRECT VETERINARY SURGERY, LLC

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