Anesthetic Risks

To give truly informed consent, pet owners should be educated about the risks of anesthesia.

According to literature reviews, overall risk for anesthetic-related mortality within 48 hours of an anesthetic event is 0.17% in dogs, 0.24% in cats, and 1.39% in rabbits. In healthy pets, the risk is 0.05%, 0.11%, and 0.73% in dogs, cats, and rabbits, respectively. The risks in sick patients is 1.33%, 1.4%, and 7.37% in dogs, cats, and rabbits, respectively. In humans, anesthetic-related deaths are much less common and account for 1 in every 100 000 to 200 000 general anesthesia patients.

The American Society of Anesthesiologists (ASA) physical status measurement categorizes patients on a scale from ASA 1 (no detected abnormalities) to ASA 5 (not expected to survive 24 hours). Although not a risk assessment, this scale indicates the likelihood of a patient's condition affecting anesthetic outcome. Other factors that may impact outcome include surgeon and anesthetist experience; availability of correct, fully checked anesthetic and surgical equipment; and correct use of checklists and emergency protocols.

It is always important to consider the expected benefits of a procedure in contrast to potential risks of anesthesia when discussing risks with owners and to recognize when referral to an anesthesiologist is warranted.—*Self I*

Feline Tooth Extraction

Feline tooth extractions should be performed with consideration for each root's morphology. All teeth should undergo radiography to assess for feline odontoclastic resorptive lesions (FORLs).

Small teeth need precise, gentle forces. Once sectioned, many roots can be loosened with rotation because of their somewhat round cross sections. Small feline roots should be loosened with super slim feline elevators (Couplands type, 1.8-mm tip). Fine-beaked extraction forceps (pattern 76N) should then be used to grip and gently rotate the root around the long axis, eventually popping the bulbous end of the loosened root through the constriction in the socket by pulling. This technique can be used for teeth with Type 1 FORLs, although surgical extraction may be necessary if the root fractures.

Upper canine teeth can be approached similarly, with a Couplands No. 1 extractor or winged elevator. Force in the buccal direction can lead to fractures and healing complications and should be avoided. An open surgical approach should always be employed for extraction of lower canine teeth. Surgical extractions, which can be performed on any teeth, may be especially useful for multiple tooth extractions, ankylosed roots, and root fractures below bone level.

Crown amputation with intentional root retention can be considered for Type 2 FORLs and is a good option when little or no root remains. However, data are insufficient regarding consequences of leaving portions of roots behind. Partially drilling out roots may be considered up to a maximum depth of 3 mm; this should be done only for Type 2 FORLs following crown amputation and in cases in which there is no concurrent apical pathology.—*Robinson J*

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New Routes to Lymphoproliferative Disease Diagnosis

PCR for antigen receptor rearrangements (PARR) and flow cytometry have greatly increased understanding of lymphoma and leukemia in dogs and cats. Their enhanced sensitivity and specificity allow clinicians to evaluate cases that could otherwise present diagnostic dilemmas.

PARR is a highly sensitive technique used to identify relatively small numbers of clonal lymphocytes by detecting whether there is the expected variation in T-cell and B-cell genes, as seen in normal mixed populations of lymphocytes, or whether there is a restricted neoplastic clone. An important limitation is the impossibility of designing PCR primers that could detect all possible gene rearrangements. Thus, approximately 20% to 25% of confirmed lymphoma cases may go undetected by this assay.

As compared with PARR, flow cytometry provides a much more detailed phenotypic assessment without the limit in sensitivity and can provide additional prognostic information. This diagnostic method, long used to classify human lymphoproliferative disorders, is expanding in veterinary medicine as new reagents become available. Investigations are underway to determine whether certain phenotypic markers can predict treatment response rates and/or survival times in canine and feline leukemias and lymphomas. Clinicians should be familiar with both PARR and flow cytometry to use them appropriately.—*Avery P*

Problematic Pupils: A Logical Approach to Anisocoria

Constriction of the pupil is controlled by the parasympathetic component of the oculomotor nerve. Pupillary dilation is controlled by the long sympathetic pathway from the brain to the eye. When evaluating a patient with anisocoria, it is important to determine which pupil is abnormal.

Examination of the patient in both bright and dark environments is useful. An inappropriately constricted (miotic) pupil will be more obvious in the dark. An inappropriately dilated (mydriatic) pupil will be more obvious in bright light. Unilateral blindness usually produces little or no anisocoria.

Nonneurologic ocular causes (eg, iris atrophy, glaucoma, atropine administration, uveitis) should be ruled out when anisocoria is present. A lesion of the parasympathetic component of the oculomotor nerve will result in a visual eye with intact menace and no pupillary light response. Such lesions may be anywhere between the oculomotor neuron in the midbrain and the retrobulbar space. Pilocarpine application should result in pupil constriction.

A lesion in the sympathetic innervation to the eye will usually result in Horner's syndrome (ie, ptosis, enophthalmos, protruding nictitans). Lesions between the brain and upper thoracic spine will likely cause concurrent neurologic deficits (eg, hemiparesis). Lesions between the thorax and the eye may not present with concurrent deficits. A thorough clinical examination and imaging of the neck and thorax are warranted. Topical phenylephrine may be used as a guide but should not be considered definitive for lesion localization.—*Ives E*

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Cardiac Biomarkers: A Case-Based Approach

The most commonly used cardiac biomarkers in veterinary medicine are N-terminal pro B-type natriuretic peptide (NT-proBNP) and cardiac troponin-I (cTnI). NT-proBNP is released following stretch of the atrial and ventricular myocardium secondary to increased pressure and wall stress. cTnI is released specifically from cardiomyocytes following ischemia, necrosis, or cardiomyocyte injury. NT-proBNP elevation should increase suspicion of cardiac disease and prompt further diagnostics such as echocardiography or ECG. For general practitioners, NT-proBNP assessment can be most helpful for distinguishing cardiac from respiratory disease as a cause of dyspnea or for screening dogs with mitral valve disease or dilated cardiomyopathy for risk for developing heart failure.

cTnI elevation is seen with cardiomyocyte damage and is caused by structural heart disease, arrhythmias, drug toxicity, and systemic disease. Serial cTnI testing may prove more helpful than a single, standalone measurement in an individual patient. However, NT-proBNP and cTnI can be elevated secondary to other systemic conditions (eg, neoplasia, sepsis, renal insufficiency, pulmonary and systemic hypertension, immune-mediated disease), potentially limiting their use as sole diagnostic tools in assessing presence of cardiac disease.—*Linney C*

From Myasthenia Gravis to Myopathies

Neuromuscular disease should always be suspected or considered when gait abnormalities are present in all 4 limbs and with exercise intolerance, muscle atrophy, laryngeal paralysis, and dysphagia. The 3 main neuromuscular diseases causing tetraparesis are polyradiculoneuritis, myasthenia gravis, and polymyositis.

Polyradiculoneuritis is characterized by flaccid tetraparesis with diminished reflexes. Eating, urination, and tail wagging are preserved. Electrodiagnostic tests show prolonged nerve root conduction and denervation.

In myasthenia gravis, gait worsens dramatically with exercise. Dysphagia, regurgitation, and megaesophagus are common. Affected patients greatly improve with acetylcholinesterase inhibitors.

Polymyositis patients fatigue without returning to normal. Muscle atrophy is prominent, as is megaesophagus. Creatine kinase is usually elevated.

Exercise intolerance can be seen with myasthenia gravis, exercise-induced collapse, malignant hyperthermia, and inherited myopathies. Diagnosis is made by observing episodes and performing clinical examination with blood testing before and after collapse. Muscle atrophy can be generalized, as in polymyositis; restricted to a single limb, as with disuse or neurogenic cases; or found specifically in the muscles of mastication, as from neoplasia, inflammatory myopathy, age, hyperadrenocorticism, or denervation due to inflammatory neuropathy.

In young dogs, laryngeal paralysis is most often an inherited disease. In older dogs, however, it is a common sign of neuromuscular disease as part of laryngeal paralysis polyneuropathy complex. Polyneuropathy is a common predominant feature of laryngeal paralysis and is often missed or misdiagnosed as a cause of reduced mobility in older dogs.—*Harcourt-Brown T*

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