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Practical Approach to Investigating Feline Upper Respiratory Disease using Rhinoscopy – A Beginner's Guide

Upper respiratory endoscopy, when performed by an experienced clinician, can be one of the most valuable diagnostic tools available for the evaluation of upper airway diseases in cats. Upper respiratory endoscopy can be an aid in achieving a diagnosis, and can also be used for potential therapeutic intervention.

This article is intended to introduce and familiarise the general practitioner with commonly used endoscopic equipment and basic techniques required to perform a diagnostically meaningful examination of the upper respiratory tract in cats. As with many procedures, the benefits and results obtained from these procedures will relate to the degree of experience of the endoscopist.

Key words: Rhinoscopy, pharyngoscopy, laryngoscopy, bronchoscope, rigid telescope

Introduction

Endoscopy is a minimally invasive alternative to more traumatic surgical exploration of the nasal cavity and allows for direct visualisation and access of lesions or foreign material for sample procurement or removal, respectively. The major disadvantage of rhinoscopy is the inability to examine the entire rhinarium including the dorsal and middle meati. This is particularly true in smaller animals (e.g. the cat) due to significantly reduced working space compounded with highly vascular tissue that can easily bleed and hinder full evaluation.

Visualisation of the nasopharynx, oropharynx and laryngeopharynx are all considered part of a full upper respiratory examination in the cat.

Indications and Physical Examination

The indications for rhinoscopy are: sneezing/'reverse' sneezing, nasal discharge, epistaxis and abnormal stertorous sounds.

Before conducting any endoscopic examination, it is essential to perform a thorough history and clinical examination. In addition, depending on the age, chronicity, and anticipated diagnostic procedures required to achieve a diagnosis, screening tests may be required (e.g. haematology, biochemistry, electrolytes, urinalysis and blood pressure) to establish the general health and potential anaesthetic risk of the patient. The depth of evaluation will vary depending on the case; however, every case should at least have a comprehensive history and full clinical examination for lesion localisation (i.e upper respiratory vs lower respiratory).

It is vital for the practitioner to understand that, without identifying the nature and location of the problem, endoscopy will be of little diagnostic value.

Physical examination should include an assessment of nasal airflow (decreased or normal, unilateral or bilateral change) and palpation of the palate and facial bones for pain, and assessing for signs of swelling, ipsilateral epiphora and/or ipsilateral exophthalmos (Figure 1).

A conscious oral examination should ideally include a dental assessment and oropharyngeal examination. Some cats will allow for conscious digital palpation along the hard palate, soft palate and gingival margins which may identifiy incongruencies consistent with nasopharyngeal space-occupying lesions or periodontal disease as a cause for epistaxis, nasal discharge, or upper respiratory stertor. It must be remembered that despite this brief assessment, occult dental disease or oronasal fistulae can be missed on conscious physical exam. If dental disease is suspected, dental radiography is indicated, paying special attention to teeth 104, 204 (upper canines), 108 and 208 (upper 4th premolars). Additionally, any signs of exopthalmos, frontal bone asymmetry, or fleshy mass near 108 or 208 should prompt the clinician to pursue imaging for signs of erosive diseases – namely neoplasia or fungal infection (e.g. *Aspergillus* spp).

A neurological examination should focus on cranial nerve evaluation, also detecting any subtle signs of cerebral dysfunction such as weakness, decreased conscious proprioception and visual deficits, which may indicate infiltrative or erosive diseases

such as neoplasia or fungal infection (cryptococcosis or aspergillosis). If there is clinical suspicion of cryptococcosis, cytology slides of nasal secretions and Latex Cryptococcal Antigen Testing (LCAT) should be submitted, especially in those patients travelling from endemic areas (e.g. Canada, Australia, USA) or residing in areas in the UK known to have access to pigeon guano. Equally, a neurological examination should be performed in any cat with upper respiratory tract disease and suspected middle-ear involvement. Signs of peripheral vestibular disease in cats with otitis media/interna may involve head tilt, Horner's syndrome (Figure 2), circling, ataxia, and nystagmus in the absence of postural deficits.

A thorough otoscopic examination should be performed assessing the external ear canals. In cats with nasopharyngeal polyps, there may be an extension of tissue through the tympanic membrane into the horizontal ear canal. It is worth mentioning that whilst polyps originate in the tympanic bulla, they usually take one of two paths: 1) either progress down the eustacian tube and become nasopharyngal, or 2) break through the tympanic membrane and become aural polyps.

Cats presenting with epistaxis should have a blood pressure and coagulation profile, by assessment of both *primary* (platelet count and buccal mucosal bleeding time), and *secondary* haemostasis (PT and aPTT), as these patients may be at increased risk of prolonged, and potentially life threatening haemorrhage (Figure 3). These tests should be done *prior* to considering more invasive diagnostic procedures including rhinoscopy and biopsies. Although the risk of serious haemorrhage is very minor and relatively easily controlled in most 'routine' rhinoscopy cases, the nose can normally bleed heavily and can be a particular complication, especially if an underlying and unidentified coagulopathy is present.

Bacterial culture and antimicrobial susceptibility testing of superficial nasal swabs are often unrewarding and not generally recommended. Results typically yield normal intranasal bacterial flora and are difficult to interpret (Kuehn 2006). Others suggest that results of culture and sensitivity testing may be useful in guiding antibacterial therapy (Michaelis 2003, Cape 1992). In one study, cultures of nasal flush fluid and tissue biopsy samples yielded similar species but aerobic and anaerobic cultures of nasal flush fluid

Figure 1: A 13 year old DSH presenting with unilateral facial swelling, pain, epiphora in left eye.

Figure 2: Cat presenting with acute onset Horner's syndrome associated with nasopharyngeal lymphoma. The lymphoma spread to cervical structures causing unilateral laryngeal paralysis and Horner's.

Figure 3: Bilateral epistaxis caused by systemic hypertension.

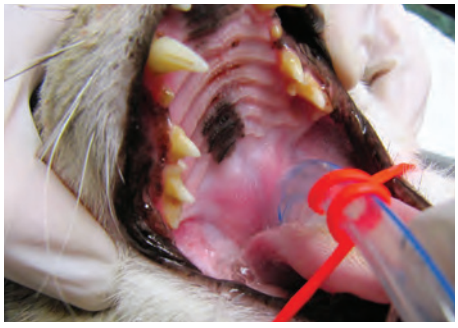

Figure 4: Intraoral view of soft palate demonstrating ventral deviation of soft palate from nasopharyngeal space occupying mass.

samples were positive for various species significantly more often (Johnson 2009). Cultures of nasal biopsy samples may be more representative for deep mucosal infections (Johnson 2005), but this has not been definitively proven. In another study, different organisms were cultured from each sample type, so the most complete results may be obtained by collecting and culturing both nasal flush fluid and biopsy samples (Johnson 2005). These culture results may not, however, correlate with the inciting pathogen due to the presence of normal bacterial flora and other superficial bacteria.

Feline herpesvirus-1 (FHV-1) or FCV virus isolation and nucleic acid amplification techniques in cats are often used to implicate infection by these organisms. FHV-1 PCR assays are widely available and feline calicivirus reverse transcriptase PCR assays are also available (Scherk 2010). However, none of the PCR assays for FHV-1 have been shown to distinguish between wild-type virus and vaccine virus (Maggs 2005). Additionally, test sensitivity (detection limits and rates) varies greatly between the tests and laboratories. These infectious agents can be detected in healthy cats as well as in clinically ill cats. Thus, the positive predictive value for these assays is low. Equally, although considered an uncommon cause of chronic upper respiratory tract disease in cats, virus isolation would be most useful for FCV and can be isolated from nasal, conjunctival or oro-pharyngeal swabs (Gaskell & Dawson, 1998). It must be appreciated that virus isolation may give a 'false negative' due to small numbers of virions in the sample, virus inactivation during transit, or to the presence of antibodies in extracellular fluids that prevent virus replication in vitro. The chance of successful virus isolation can be maximised if swabs from both conjunctiva and oropharynx are collected (Marsilio et al., 2005). Because of the relatively low positive and negative predictive values of these tests in the clinical setting, the author seldom performs viral testing in the first instance.

Examination under General Anaesthesia

For a complete evaluation of the nasal cavity, sinuses and nasopharynx, the assessment should include repeat examination of the oropharynx/dentition, imaging such as skull radiography, CT/MRI, dental radiography, and rhinoscopy under general anaesthesia. Assessment of the oral cavitiy may reveal protrusion of the soft palate and indicate nasopharyngeal space-occupying lesions such as polyps, neoplasia and fungal granulomas (Figure 4).

Imaging Studies

Radiography is one of the principal diagnostic methods used in the

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