NASAL DISCHARGE

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Nasal discharge typically manifests as chronic disease, but can sometimes result in acute, emergent presentation. Nasal disease presents unique diagnostic and treatment challenges due to difficulties of imaging, obtaining appropriate samples, and directly treating the problem. This presentation will help to highlight various types of nasal discharge to include as differential diagnoses, provide guidance on physical examination techniques to localize disease, and outline a diagnostic plan.

History and Physical Examination for Nasal Disease Presentations: Clients become aware of nasal passage disease through a variety of observations including sneezing, presence of discharge, "nosebleed" (hemorrhage), changes in respiratory sounds, and changes in character of the nasal planum or muzzle. Some nasal disease signs can occur quickly such as hemorrhage or upper respiratory infection, while others can have a more prolonged course with or without an acute exacerbation. Recognition of whether the discharge is unilateral or bilateral, or began as a unilateral discharge and became bilateral over time, can help in determining an appropriate differential diagnosis list. Examination techniques to identify abnormal nasal passage disease include sneezing during examination, audible sounds from the nasal passage (i.e. "stertor"), discharge from one or both nares, character of the discharge (serous, serosanguineous, mucoid, mucopurulent, hemorrhagic), evidence and duration of nasal depigmentation, and facial/ nasal deformity. Acute-onset of sneezing or nasal discharge in a puppy or kitten, or in an animal recently exposed to other animals in a shelter or kennel situation, should prompt the veterinary staff to immediately isolate that patient away from others to prevent potential spread of a contagion since upper respiratory infections can be disseminated by airborne and fomite transfer. Examination techniques that should be included for every patient with chronic nasal discharge include retropulsion of the eyes, palpation of the bridge of the nose, and evaluation of the teeth and hard palate to identify potential masses, oronasal fistulas, or severe dental disease. Air flow should be confirmed from both nostrils. Techniques to check for air flow include fogging on a glass slide with exhalation, or movement of a dry cotton wisp. While either technique can be utilized to identify air leaving the nasal passage, movement of the cotton fibers can also indicate air moving into the nasal passage. Dogs and cats should be able to breathe normally with a closed mouth. If closed-mouth breathing creates discomfort or anxiety, a complete obstruction of the nasopharynx should be considered. When the nasal passages are completely occluded with discharge or mass, attempts to hold the mouth closed during examination can cause agitation and distress. (1)

Nasal Discharge Categorized by Character of Discharge:

Nasal discharge can be categorized by the character of the discharge; however, the type of discharge can change with progression of disease, and many primary nasal diseases can cause secondary bacterial infections accompanied by mucopurulent discharge. Careful questioning of the client for patient history is helpful to reveal changes in character of discharge over time.

Epistaxis can be classified as frank hemorrhage or serosanguenous nasal discharge. While clients often interpret this finding as a spontaneous "nosebleed", there is usually an underlying reason. This finding can occur with coagulopathy, nasal trauma (to include acute foreign body), fungal disease, or mass, although the latter two differentials typically have a more longstanding history. Occasionally, severe sneezing can cause epistaxis from trauma to the nasal mucosa, but hemorrhage should subside quickly if coagulation ability is normal. Infrequent causes of epistaxis include hyperviscosity syndrome and hypertension. (2, 3) Acute unilateral or bilateral epistaxis occurs with abnormalities in the primary (platelets) or secondary (clotting factors) coagulation systems, especially in the absence of trauma. Unless obvious trauma or mass are identified, coagulation testing (platelet count, prothrombin time (PT), partial thromboplastin time (PTT)), blood pressure measurement, complete blood count (CBC) and serum biochemical profile are warranted. If coagulopathy is identified, epistaxis should resolve with resolution of the coagulopathy. Emergency management for severe epistaxis includes application of dilute epinephrine intranasally to promote vasoconstriction, packing the nose with umbilical tape that can be removed slowly once hemorrhage has subsided, and application of cold packs over the nasal planum.

Mucoid/ Mucopurulent discharge that presents as an acute, bilateral discharge is most commonly associated with upper respiratory infection. Primary bacterial infection is rarely the sole cause of nasal discharge, although bacteria can be cultured easily from the nasal passages. Acute mucopurulent infection in young kittens or puppies is most commonly a result of contagious viral diseases, including canine distemper virus for dogs and feline upper respiratory viral infections for cats.(4) Young animals, or animals with recent exposure to other unknown animals, should be quarantined upon arrival to the veterinary hospital to prevent exposure to contagions that could cause nosocomial infections. Severe vomiting can also cause acute mucoid or mucopurulent nasal discharge if the nasal passages are exposed to acidic gastric fluid. More longstanding or chronic mucoid/ mucopurulent discharge, either unilateral or bilateral, can be caused by nasal neoplasia, inflammatory nasal disease, fungal disease, tooth root abscesses, or foreign body, any of which can be accompanied by a secondary bacterial rhinitis. In some cases, a definitive diagnosis is not made following complete diagnostic evaluation of the nasal passages. Nasal planum depigmentation can also occur with chronic discharge. (1, 5, 6)

Serous nasal discharge is an uncommon presenting complaint for emergency care, and is more often an acute change. Differentials to consider for serous discharge include early onset of canine and feline viral infections (especially when accompanied by sneezing), stress, allergic reaction, or nasal mites. These patients should also be isolated at the time of arrival to prevent exposure to contagion.

Diagnostic Evaluation for Nasal Disease:

There are a number of steps that can be helpful in confirming a diagnosis. Duration and character of nasal discharge as well as concurrent physical examination abnormalities will help to guide the correct diagnostic path. Evaluation of systemic health through complete blood count (CBC) and serum biochemical profile is warranted for any animal with chronic nasal discharge, as well as those with evidence of systemic illness (fever, lethargy, etc.). Coagulation testing (platelet count, coagulation factor testing), blood pressure evaluation, and blood protein evaluation should always be performed in any animal with epistaxis. Testing for leishmanaiasis or ehrlichiosis should be included in certain geographic regions. In cats with chronic nasal discharge, *Cryptococcus* antigen testing is widely available, inexpensive, and is both sensitive and specific to identify this pathogen.

Direct visualization into the nares with a bright light source in the sedated or anesthetized animal is generally low-yield, but should always be performed prior to other diagnostic steps to ensure that a visible foreign body or mass is not missed. If a foreign body can be visualized, it can often be removed with hemostatic forceps, and masses can be biopsied or aspirated. While under general anesthesia, the mouth can be opened and the soft palate can be gently retracted orally and the nasopharyngeal area can be inspected using a small dental mirror to evaluate for the presence of a polyp or mass lesion.

Bacterial culture of the nasal discharge is rarely helpful since the nasal passages are colonized with a number of different bacterial species normally, and a positive culture result does not correlate with the cause of disease. Occasionally, cytology of the nasal discharge to evaluate for fungal organisms can be helpful in cats with suspected upper respiratory cryptococcosis, or dogs with systemic fungal disease affecting the nasal passages. If there is a visible mass protruding from the nasal passage, fine needle aspirate and lymph node cytology can be performed. If submandibular lymphadenopathy is present, fine-needle aspirate of the lymph node and cytology sometimes reveals fungal disease or neoplasia.

Dental probing under general anesthesia can reveal the presence of a deep tooth root abscess as a cause of chronic nasal discharge, and is easy to perform with routine tools available in general practice.

Diagnostic imaging of the nasal passages is important to establish a diagnosis in chronic or recurrent epistaxis or nasal discharge, and when there is evidence of structural disease on exam (e.g. loss of airflow, facial asymmetry, reduced ocular retropulsion). Diagnostic quality nasal radiographs must be performed under general anesthesia, since positioning requires for the mouth to be fully opened and the head to be symmetrical and positioned for the beam to only include the nasal passages without surrounding oral or mandibular structures. Dental-quality radiographs should be performed if physical examination and dental probing reveal evidence of possible dental disease.

Studies have compared commuted tomography (CT) and magnetic resonance imaging (MRI) of the nasal cavity, and have found both modalities to be of diagnostic quality. Generally, CT is more widely available, less expensive, and can be performed more quickly, and at referral institutions has replaced radiography as the

imaging modality of choice for nasal disease. In addition, CT and MRI can provide evidence of cribiform plate destruction which is an important consideration for treatment planning and prognosis. Contrast-enhanced imaging is recommended to distinguish fluid from tissue/ mass lesion. Mass lesions, turbinate destruction, shifting of the median raphe, and bone destruction can all be identified with advanced imaging. Nasal fungal infections (nasal aspergillosis) and non-metallic foreign bodies generally cannot be distinguished from mucus with CT or MRI. (7-10)

Rhinoscopy of the nasal passages generally follows advanced imaging under the same general anesthesia at most referral practices, using the information gained from the imaging study to direct the rhinoscopic examination. Rhinoscopy is useful for direct visualization of fungal plaques consistent with nasal aspergillosis, identification of turbinate destruction and foreign objects, and mass localization. Cytology +/- culture of fungal plaques can definitively diagnose nasal aspergillosis. Limitations of rhinoscopy include technical difficulty in patients with very small nasal passages, inability to visualize the frontal sinuses, and obscuring of direct visualization from mucoid discharge and hemorrhage. Rhinotomy / sinusotomy can be performed for more thorough visualization of structures to obtain a definitive diagnosis, and to instill antifungal medication with nasal aspergillosis.

Biopsy should be obtained from any mass lesion, and when an underlying cause of nasal discharge cannot be identified from other diagnostic testing. Biopsy can either be directed by rhinoscopic localization, or can be performed with a blind biopsy technique. The biopsy instrument should not be advanced beyond the level of the medial canthus to avoid injury to the central nervous system. Obtaining several pieces of tissue can enhance diagnostic yield. One of the samples can be used to perform cytology if a more rapid diagnosis is needed. Although not all neoplasms will exfoliate easily, nasal passage lymphoma can be identified on cytologic evaluation. Common nasal neoplasms in dogs include adenocarcinoma, other carcinomas, sarcomas, and lymphoma. Melanoma, hemangiosarcoma, and transmissible venereal tumor can also occur. Cats more commonly develop squamous cell carcinoma and lymphoma. Identification of inflammatory disease on histopathology is challenging since inflammatory disease can be primary, but can also be a secondary finding to the definitive diagnosis. Certain neoplasms can appear to be inflammatory on the surface. Likewise, reflux of gastric contents into the choanal area or nasal passages, or fungal infection in the frontal sinus, can yield histopathology consistent with inflammation as a secondary lesion.

Nasal passage lavage can be accomplished under general anesthesia using sterile 0.9% saline and red rubber catheters, either retrograde from the nostrils or antegrade by advancing tubes through the nasal pharynx. This procedure is less expensive than rhinoscopy, can be very helpful in cats and small dogs to remove thick mucus and temporarily alleviate clinical signs while a therapeutic plan is being instituted, and can flush small foreign bodies like plant material from the nasal passages. Remember to ensure that the endotracheal tube cuff is adequately inflated and that laparotomy pads are placed in the oropharynx to limit risk of aspiration pneumonia from the nasal flush fluid.

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