

Practical Approaches to Sinus Disease

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Sinus Anatomy

Seven paired sinus compartments:

1. Dorsal conchal (DCS)
2. Ventral conchal sinus (VCS)
3. Sphenopalatine
4. Ethmoidal
5. Frontal (FMS)
6. Rostral maxillary (RMS)
7. Caudal maxillary (CMS)

In young horses (< 5 yo) the maxillary sinus is filled with the tooth roots of the four caudal cheek teeth (1/208-1/211). In horses > 5 yo, the rostral maxillary sinus contains the apical portion of 1/208 and 1/209 lie within the rostral maxillary sinus and 1/210 and 1/211 lie within the caudal maxillary sinus. In horses > 10 years of age, the rostral maxillary sinus no longer contains the apices of the 1/208. The location of the tooth root apices and volume of the tooth root contained within the sinus due to the age of the horse is an important anatomical consideration for both diagnostic and treatment considerations. The VCS and RMS communicate, but this communication occurs over the infraorbital canal by the conchomaxillary opening. Drainage from the ventral conchal sinus is therefore indirect and must follow a tortuous path to reach the RMS and drain through the nasomaxillary opening. The nasomaxillary opening drains at the level of the middle meatus, just rostral to the ethmoid turbinates.

Sinusitis

Sinusitis commonly presents due to unilateral nasal discharge with or without alteration in airflow from the nostril and facial swelling. The sinuses should be percussed/tapped to listen for dullness on the affected side, consistent with the presence of space occupying material (Fluid/pus/neoplasia)

Diagnostics to consider:

1. Skull Radiography (Lateral, dorsoventral +/- offset DV, oblique)
2. Oral Exam with dental mirror and probe
3. Sinocentesis
 - a. Fluid analysis and cytology
 - b. Culture
4. Endoscopy
 - a. Nasal
 - b. Sinus (Sinoscopy) via trephination portal
 - c. Oral
5. Computed Tomography (Standing sedation or general anesthesia)
6. Nuclear Scintigraphy

Causes of sinusitis

7. Primary Sinusitis: A bacterial infection of the sinus that occurs without an inciting cause
 - a. If chronic, persistent infection...consider
 - i. Inappetent pus within the ventral conchal sinus
 - ii. Secondary sinusitis, must identify the cause to resolve infection
8. Secondary Sinusitis
 - a. Dental related abnormalities
 - i. Most Common cause of secondary sinusitis
 - ii. Bacteria spread from dental apices of 1/208-1/211
 - iii. Nasal discharge is malodorous
 - I. Apical infection
 - II. Fracture
 - III. Infundibular/peripheral caries
 - IV. Diastema/ Periodontal disease
 - V. Fracture
 - VI. Oromaxillary fistulae
 - b. Trauma (fracture)
 - c. Sinus cyst
 - d. Progressive ethmoid hematoma
 - e. Paranasal mycosis
 - f. Neoplasia

Treatment of Sinus Disease

- I. Sinus Trephination
 - a. Fenestration of the ventral conchal bulla must be performed to have adequate lavage of the RMS and VCS via trephination of the conchofrontal sinus.
 - b. Conchofrontal sinus: 60% of the distance from the midline to the medial canthus and 0.5 cm caudal to the medial canthus
 - c. Rostral maxillary sinus: 50% of the distance from the rostral aspect of the facial crest to the level of the medial canthus and 1 cm ventral to a line joining the infraorbital foramen and medial canthus
 - d. Caudal maxillary sinus: 2 cm rostral and 2 cm ventral to the medial canthus
- II. Sinus Lavage
 - a. Lavage with isotonic fluids. Hypotonic fluids will cause further edema of the respiratory mucosa within the paranasal cavity
- III. Broad-spectrum antimicrobials
- IV. Remove inciting cause of secondary sinusitis if secondary
 - a. Dental abnormality→Tooth Removal
 - i. Oral Extraction (Must have enough reserve crown)
 1. Preferred
 - ii. Repulsion
 1. Trans-buccal

- 2. Buccotomy
 - 3. Sinusotomy
- b. Fracture
 - i. Remove small bone fragments
 - ii. Replace and retain bone fragments
- c. Sinus cyst
 - i. Sinusotomy for removal of the cyst and the entire cyst lining
- d. Progressive Ethmoid Hematoma
 - i. Within nasal passage and <5 cm
 - 1. Formalin Injection
 - 2. Laser ablation of the base
 - ii. >5 cm or within the sinus
 - 1. Sinusotomy
- e. Paranasal Mycosis
- f. Neoplasia
 - i. Sinusotomy with mass removal
 - ii. Prognosis is guarded to poor