



**Beni-Suef University**  
**Faculty of Veterinary Medicine**  
**Surgery, Anesthesiology, and Radiology Department**

## **PARANASAL SINUSES AFFECTIONS**

### **I-SINUSITIS: -**

It is the inflammation of the paranasal sinuses, if this inflammation is purulent and the pus is accumulated in the sinuses, the condition is called sinus *empyema*.

#### **\*Etiology**

- 1-As a complication of acute or chronic respiratory disease
- 2-Alveolar periostitis or fracture of the frontal or maxillary bone (common in horse)
- 3-Parasites, cysts, or tumors in the sinus
- 4-Infection of the frontal sinus after dehorning or following fracture of the horn in mature animals

#### **\*Symptoms**

The most evident clinical signs are; nasal discharge, ocular discharge, bony distortion, obstruction to airflow, and sometimes swelling of the submaxillary lymph node. Dull sound emitted on percussion on the sinus with evidence of pain.

Nasal discharge occurs only on the side of the involved sinus, as the nasomaxillary opening is located within the nasal cavity. The exudate is mucopurulent and may contain bloody components, and hemorrhage suggests the presence of granulomatous or neoplastic lesions. Necrosis may ensue and frequently involves the bony tissue when alveolar periostitis is present and the discharge here has offensive odour.

Epiphora on the affected side can be observed as a result of pressure of the affected sinus on the nasolacrimal duct.



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Facial distortion and swelling is an evident of; space occupying lesion like neoplasm, over granulation tissue, or cyst; alveolar periostitis; or accumulation of fluid.

The closed compartment distension usually associated with internal distortion of the nasal cavity with subsequent obstruction of the airflow.

### \*Treatment

The condition may response to local treatment with antibiotic that can be applied into the sinus by drilling otherwise the treatment is surgical via trephination and irrigation of the sinus with antiseptics and if the cause is alveolar periostitis, repulsion of the affected tooth is indicated. This type of treatment may last for 1-2 months till obliteration of the sinus by granulation tissue occurs.

### ***TREPHINATION (IN HORSE):***

This technique is used mainly for treatment of chronic sinus empyema, dental diseases, neoplasia, and conchal or septal necrosis. Selection of the trephine site depends on the indication for the procedure. General anesthesia is usually required but in some circumstances, local analgesia and sedation may be satisfactory. The surgical site is clipped and prepared for aseptic surgery, and then a circular skin incision is made slightly larger in diameter than the trephine. The frontal and caudal maxillary sinuses have minimal subcutaneous tissue, but the rostral maxillary sinus has the *levator labii maxillars* muscle that should be reflected prior to trephination. The periosteum is incised by X-shape incision and then reflected, and then a circular bone osteotomy is performed by the appropriately sized Gault trephine.

### **1-Maxillary sinus: -**

The surgical limits of the maxillary sinus are defined to provide the maximum exposure with protection of the infra-orbital canal and the nasolacrimal duct.

### **\*Rostral limit:**

Line from the rostral end of the facial crest to the infra-orbital foramen.



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**\*Dorsal limit:**

Line from the infra-orbital foramen to the medial canthus of the eye.

**\*Caudal limit:**

Line from the medial canthus of the eye to the caudal aspect of the facial crest (parallel to the rostral limit).

**\*Ventral limit:**

The facial crest itself.

**A-Superior (Caudal) Maxillary Sinus: -**

Trephination is performed 4 cm dorsal to the distal extremity of the facial crest and 2.5 cm medially.

**B-Inferior (Rostral) Maxillary Sinus: -**

Trephination is performed 2.5 cm medially from the distal extremity of the facial crest.

**2-Frontal sinus: -**

**A-High Site: -**

Make a line joins the two supra-orbital processes and bisect it. Trephination should be performed in the inferior angle, 1.5-2.5 cm below and to on side of this point.

**B-Low Site: -**

Make a line joining the inner canthus of the eye and the junction of the nasal and paramaxilla bones, then trephination is performed 6.5 cm down and 2.5 cm in front of this line (it is nearly at the same level of superior maxillary sinus trephination).



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### ***BONE FLAP TECHNIQUE:***

It is a technique superior to trephination technique as it permits maximum exposure of the sinus, allowing better visualization and surgical manipulation within the sinus, and eliminates the need for multiple trephine opening. This technique can be used for examination of the frontal, maxillary sinuses and the nasal cavity.

The boundaries of area to be operated should be determined and prepared for aseptic surgery, then the rostral; ventral; and caudal borders are incised, dissected, and the peri-osteum is incised too and reflected. Osteotomy is performed on the three sides then the bone flap is slowly elevated and so all the sinus could be visualized. Following the operation, the flap returned to its original site, then the layers are closed layer by layer.

### **II-NEW GROWTHS IN THE SINUSES (Space Occupying Lesions): -**

Granulomatous and neoplastic lesions of the paranasal sinuses are difficult to be treated.

*Granulomatous lesions* are caused by mycotic agents and successful management includes bone flap trephination, cryotherapy, and application of local anti-fungal agents, however the prognosis is poor depending up on surgical accessibility and extent of the lesion.

*Neoplastic affections* of the sinuses is not a rare condition, however surgical treatment of such affection usually of no value and it is better to keep the animal on light work and if the animal suffers from dyspnea, tracheotomy is indicated.

### **III-MAXILLARY CYSTS: -**

Multi-located cystic lesions cause sinus enlargement and sometimes partial to complete obstruction of the nasal cavity. Affected animals usually young (1-2 years) but elder horses could be affected too. Although clinical signs may suggest dental disease, oral examination revealed no remarkable lesion.



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Percutaneous centesis yields acellular yellow or pink fluid, unless secondary bacterial invasion ensue. Dorso-ventral radiographic view revealed that the rostral and/ or the caudal maxillary sinus is distended both axially and biaxially and may displace the nasal septum.

The etiology is unclear although the cyst may be developmental and may arise from embryonic structures of the tooth root.

*\*Treatment:*

Bone flap technique is superior to trephination for treatment of such affection. The cyst is typically composed of spongy membrane, which is removed, by blunt dissection or curettage. The involved teeth may be repelled, and an additional drainage can be established into the nasal cavity by enlarging the maxillary opening or breaking through the conchal portion of the involved sinus. Maintenance of this opening can be achieved by insertion of gauze setons that is positioned and exist through the external nares.

Post-operative care involves lavage of the cavity by anti-microbial or diluted povidone iodine through indwelling system. Treatment can take 10-14 days according to the nature and amount of the exudates.