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TriDent
CONFERENCE

Unilateral nasal discharge - is it always dental?

Neil Townsend MSc BVSc Cert ES (Soft Tissue) DipECVS DipEVDC (Equine) FNCED FRCVS

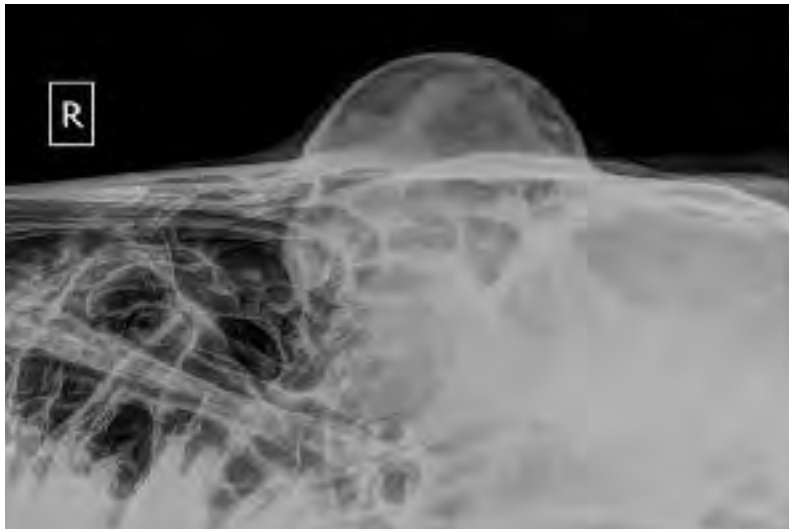
EBVS EUROPEAN BOARD OF VETERINARY SPECIALISATION

EVDC EUROPEAN VETERINARY DENTAL COLLEGE

ECVS SPECIALIST SURGEON

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Introduction





- Causes of unilateral nasal discharge
- Causes of sinusitis
- Treatment of different types of sinusitis

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Where is the Discharge coming from?

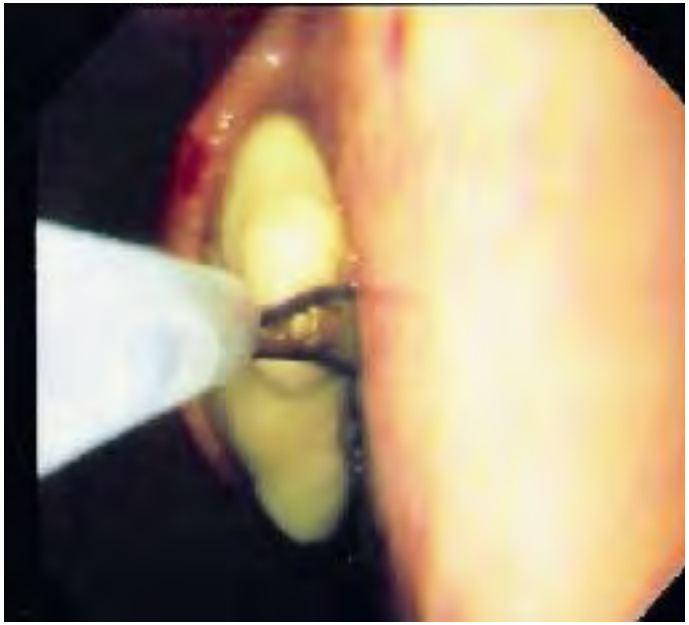


- **Sinus**
- **Nasal cavity**
- Guttural pouch
- Lower Respiratory tract

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Guttural Pouch





- Most common is strangles
  - Strep equi var equi
- Strep zooepidimenicus
- Biosecurity concerns
  - Check temperature
  - Lymph node swellings
  - Other horses affected

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Lower respiratory tract





- Usually respiratory tract virus
  - Equine influenza
  - Equine herpes
- Biosecurity concerns

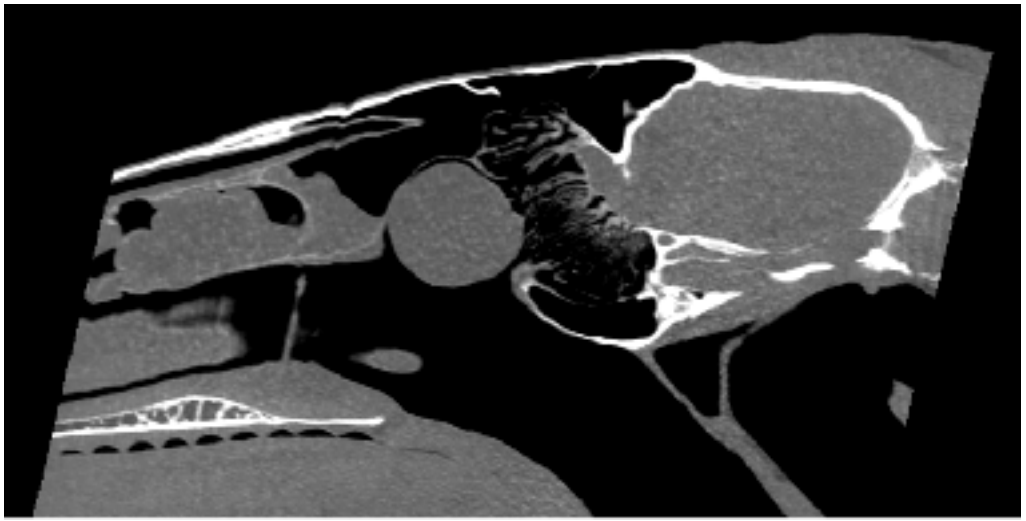
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Unilateral nasal discharge



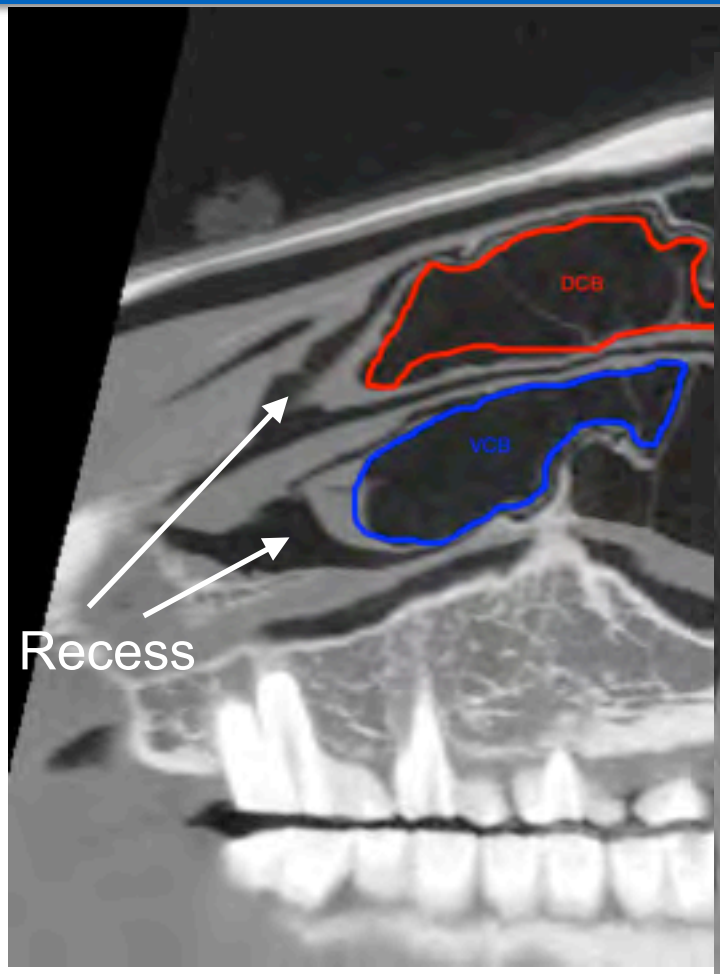
- Sinusitis is the most common cause of unilateral nasal discharge
  - Don't forget other causes!

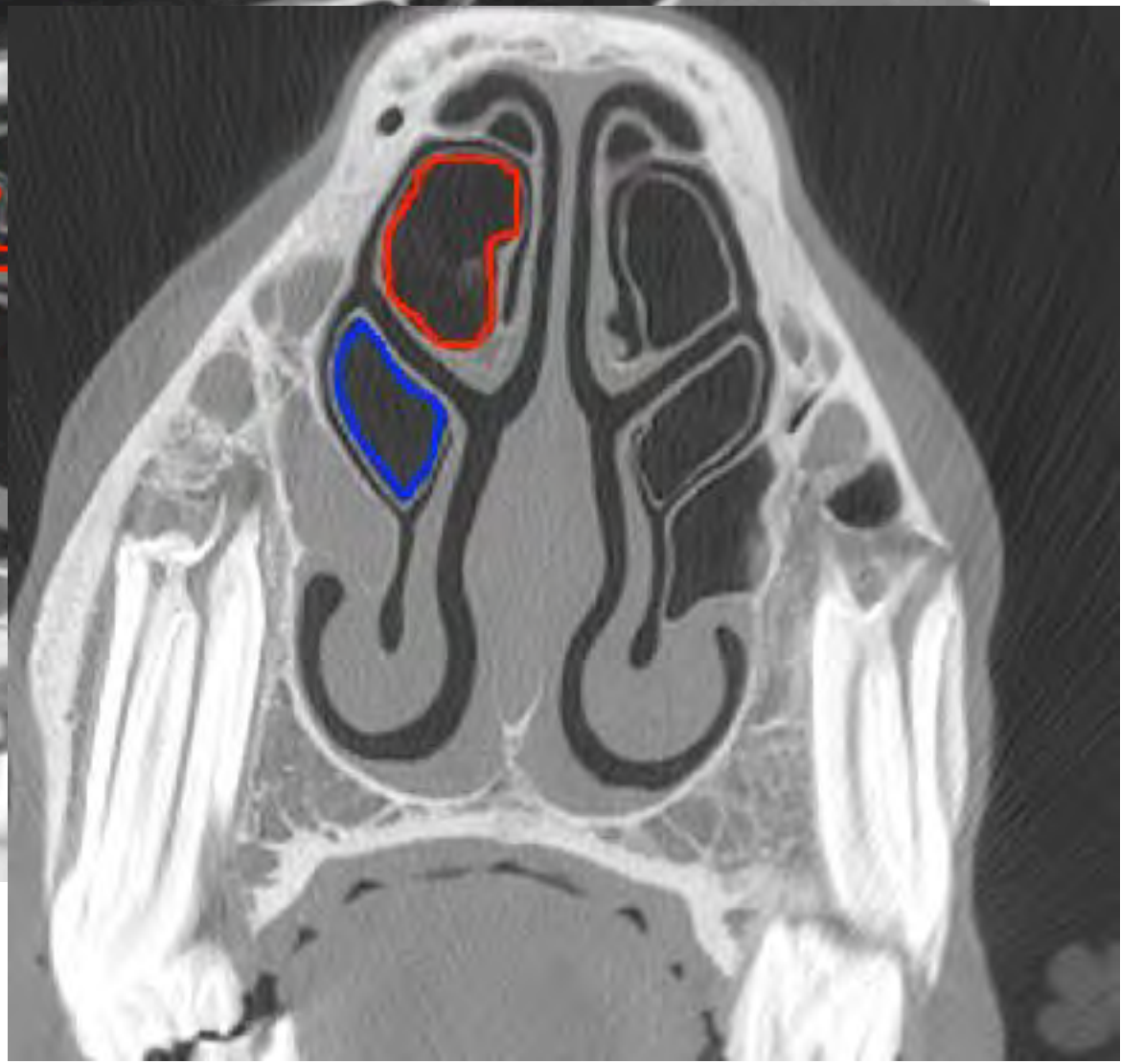




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Anatomy





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Sinusitis Literature (2001)

A long-term study of 277 cases of equine sinonasal disease. Part 1: Details of horses, historical, clinical and ancillary diagnostic findings

W. H. TREMAINE and P. M. DIXON

A long-term study of 277 cases of equine sinonasal disease. Part 2: Treatments and results of treatments

W. H. TREMAINE and P. M. DIXON

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Sinusitis Literature (2012)

Historical and clinical features of 200 cases of equine sinus disease

P. M. Dixon, T. D. Parkin, N. Collins, C. Hawkes, N. B. Townsend, G. Fisher, R. Ealey, S. Z. Barakzai

Equine paranasal sinus disease - a long-term study of 200 cases (1997–2009): Ancillary diagnostic findings and involvement of the various sinus compartments

P. M. DIXON*, T. D. PARKIN†, N. COLLINS, C. HAWKES, N. TOWNSEND, W. H. TREMAINE, G. FISHER, R. EALEY and S. Z. BARAKZAI

Equine paranasal sinus disease: A long-term study of 200 cases (1997–2009): Treatments and long-term results of treatments

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Sinusitis Literature (2026)

Historical, clinical and nasal endoscopic findings in 1600 cases of equine sinonasal disease and associations with case outcome

Padraic Dixon[1] | Eric Parente[2] | Tim Barnett[3] | Rhiannon Morgan[4] | John Mark O'Leary[5] | Lieven Vlaminck[6] | Alison Talbot[7] | Alexandra Gillen[7] | Tom McGinley[8] | Moses Brennan[9] | Henry Tremaine[10] | Elke Polaris[11] | Erica Dobbs[12] | Ben Aghileri[13] | Linda Wright[14] | Elin Olsson[14] | Jonathan Olijnyk[15] | Charles Alexandre[16] | Neil Townsend[17] | Adam Northwood[18] | Tim Mair[19] | Richard J. M. Reardon[20]

Computed tomographic findings in 1600 cases of equine sinonasal disease and associations with case outcome

Diagnosed causes of sinonasal disease in 1600 horses and associations with clinical signs, computed tomographic findings and case outcome

Associations between treatments and response to treatments from a large multicentre study of equine sinonasal disease

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Sinusitis Prevalence (2012)

Historical and clinical features of 200 cases of equine sinus disease

P. M. Dixon, T. D. Parkin, N. Collins, C. Hawkes, N. B. Townsend, G. Fisher, R. Ealey, S. Z. Barakzai

...mber of documented observations)

Type of sinusitis	Subacute primary	Chronic primary	Dental	Dental OMF	Sinus cyst	Trauma	Neoplasia	Mycotic	PEH
Number of cases, %	52, 26%	37, 18.5%	40, 20%	8, 4%	26, 13%	13, 6.5%	10, 5%	7, 3.5%	7, 3.5%
Female	17	15	15	5	10	3	3	3	2
Male	35	22	25	3	15	10	7	4	5
Median age (years), range	12, 1-28	8.5, 6-23	12, 3-27	11.5, 4-29	9, 5-27	8, 4-26	12, 1-29	8, 3-16	5, 5-10
Median duration (days)*, range	21, 1-60	150, 62-420	90, 7-540	112, 60-365	81, 10-730	8, *-56	70, 4-365	45, 28-180	21, 5-270
Prior antibiotic administration, %	41 (49), 84%	28 (29), 97%	26 (32), 81%	7 (8), 88%	16 (20), 80%	6 (12), 50%	6 (8), 75%	4 (5), 80%	1 (5), 20%
Prior sinus lavage, %	2 (52), 4%	11 (37), 30%	2 (40), 5%	0 (8), 0%	2 (26), 8%	0 (13), 0%	0 (10), 0%	0 (7), 0%	0 (7), 0%
Prior sinusotomy, %	0 (52), 0%	4 (37), 11%	1 (40), 3%	0 (8), 0%	1 (26), 4%	0 (13), 0%	0 (10), 0%	0 (7), 0%	0 (7), 0%

* Duration of clinical signs before presentation
OMF Oromaxillary fistulas, PEH Progressive ethmoid haematoma

- Primary most common
- Dental second

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Sinusitis Prevalence (2026)

Diagnosed causes of sinonasal disease in 1600 horses and associations with clinical signs, computed tomographic findings and case outcome

Cause of sinusitis on side A	No. of cases	% of total cases	Mean	SD	Median	Range
All cases	1600	100	12	6.1	12	1–33
Dental sinusitis – total number	693	43.3	11.5	6.1	11	1–33
With post-extraction oro-maxillary fistula (OMF) ($n = 68$)						
With previous diastema-related fistula ($n = 22$)						
Post-extraction OMF sinusitis from a pre-referral extraction	20	1.3	12.7	6.1	12	4–23
Diastema-related OMF sinusitis—without apical infection	16	1	15.8	7.7	17	2–28
Primary sinusitis	329	20.6	12.8	6.2	13	1–31
Sinus cyst	178	11.1	12	6.2	13	1–25
Progressive ethmoid haematoma (PEH)	100	6.3	13.3	4.7	13	5–25
Trauma-related sinusitis	90	5.6	10.4	6.2	11	1–27
"Primary" mycotic sinusitis	65	4.1	10.5	4	10	3–20
Sinonasal neoplasms and suspected neoplasms	86	5.4	13.6	7.6	14	1–33
Non-neoplastic sinonasal growths	11	0.6	11.6	8.3	14	1–23
Sinus pneumocele	5	0.3	18.6	2.9	20	15–21
Oro-nasal fistula and secondary sinusitis	4	0.25	10.8	4.2	11.5	5–15
Sinus mucocele (sinonasal obstruction)	2	0.13	1.5	0.7	2	1–2
Infected facial bone suturitis	1	0.06	15		15	

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Key Differences



- Greater number of diagnoses available
- Awareness of nasal cavity disease
- Greater use of CT

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Interesting observation

Computed tomographic findings in 1600 cases of equine sinonasal disease and associations with case outcome

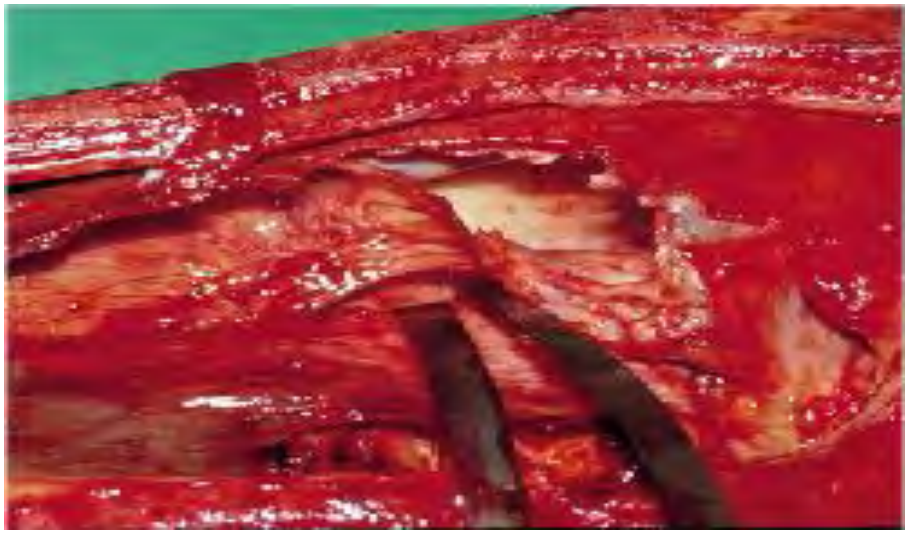
periodontal membrane. The accuracy of CT imaging for diagnosing apical infection (with a greater than 96% accuracy reported) is not in doubt,[7,8] but this study, where the CT images were read by Board-certified imagers or specialist Board-certified surgeons using current criteria to diagnose apical infections[26] show that such endodontic/apical infections of maxillary cheek teeth do not necessarily infect the overlying sinuses.

This finding has major implications in the interpretation of equine head CTs, in that it shows that the mere presence of an endodontically/apically infected tooth in an infected sinus is not conclusive evidence that the infected tooth is the cause of the sinusitis (i.e., causing dental sinusitis), particularly if the alveolus appears fully intact. If such an apical infection is contained within an intact, and often thickened, alveolus with no evidence of spread of infection into the sinus lumen, this is more likely to be a primary sinusitis with a coincidental, apically infected tooth in that sinus. However, such endodontically/apically

- Certainly observed in older horses where CT not available

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What causes a primary sinusitis?





- Any generalised URT infection/inflammation will cause increased mucous
- Swelling of the sinus mucosa decreases the diameter of drainage angle
- Non-dependant drainage
- URT virus decrease ciliary movement

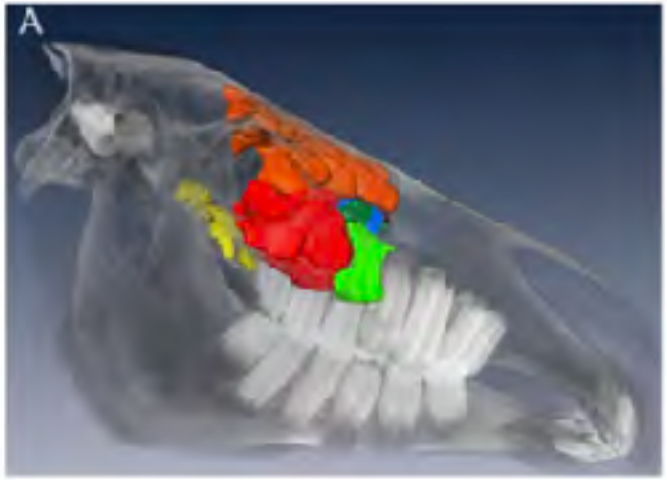
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Why is sinusitis unilateral?

RESEARCH ARTICLE Open Access

The sinonasal communication in the horse: examinations using computerized three-dimensional reformatted renderings of computed-tomography datasets

Markus Brinkschulte[1*], Astrid Bienert-Zeit[1], Matthias Lupke[2], Maren Hellige[1], Bernhard Ohnesorge[1] and Carsten Staszyk[3†]



- 19 cadaver heads
- All horses caudal drainage via CMS
- Rostral drainage 52% RMS only, 43% RMS + VCS, 5% VCS only
  - Significant variation between left and right sides

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First line treatment





- Determine infectious disease risk
- Brief dental exam
- NSAIDs
- Antimicrobials
- Feed from floor

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Diagnostic Algorithm



- Many different tests can be used

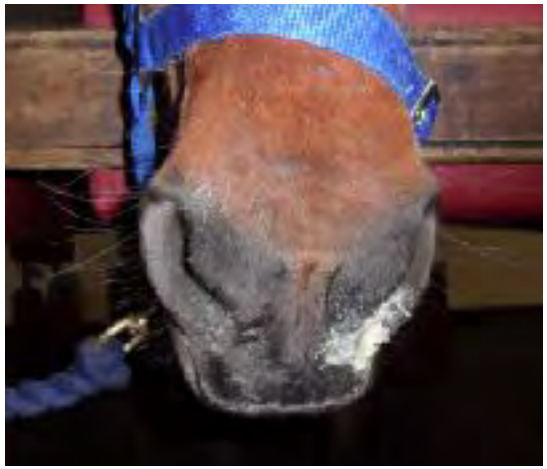
- Clinical Examination
- Nasal endoscopy
- Oral examination
- Radiography

- Sinus Endoscopy

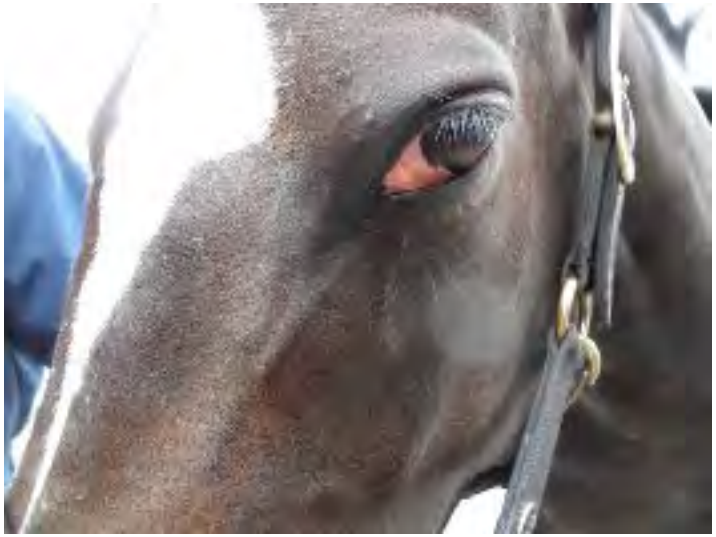
- Advanced imaging

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Clinical Signs







- Unilateral nasal discharge
- SMLN
- Epiphora
- Facial swelling
- Nasal airflow
- Exopathalmus

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Nasal Endoscopy





- Best test for determining source of nasal discharge
- Best for exploring nasal cavity
- Cannot enter sinuses unless scope v small or fistula present

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Oral Examination



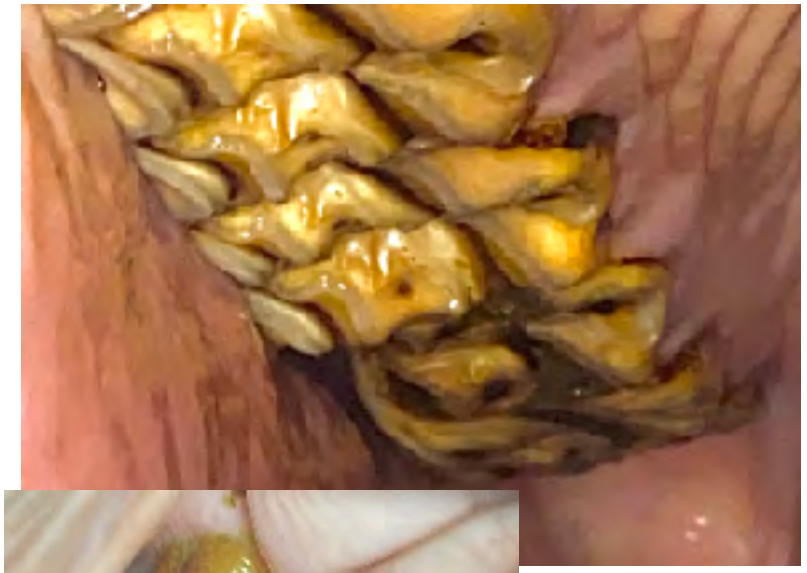


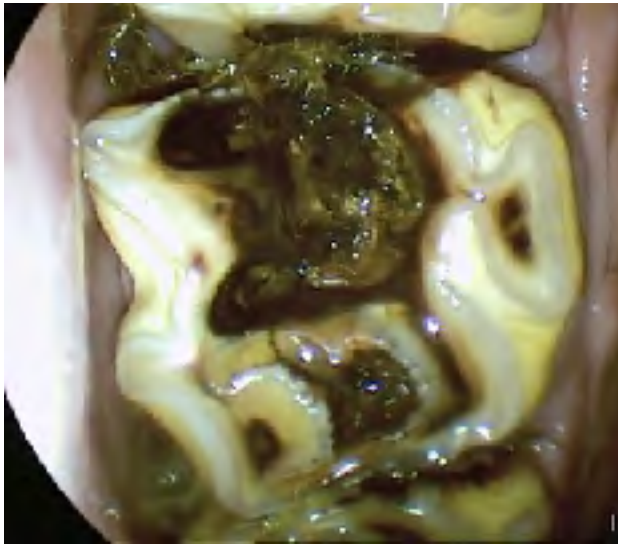
- Ideally oral endoscopy
- Examine
  - Every secondary dentine area
  - Every infundibulum
  - Every interdental space
- Gingiva surrounding teeth

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Oral examination









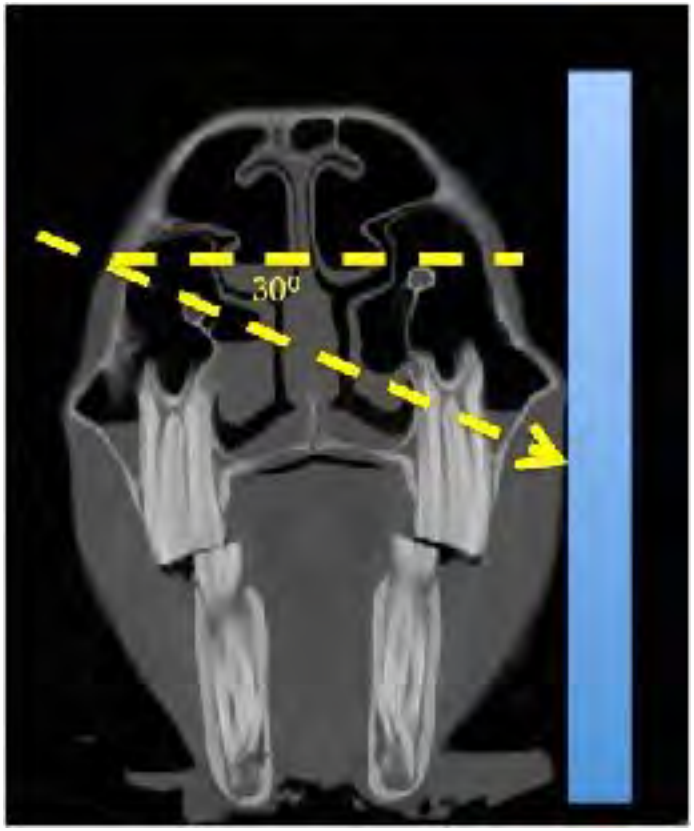
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Oral examination



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Radiography



Latero-lateral

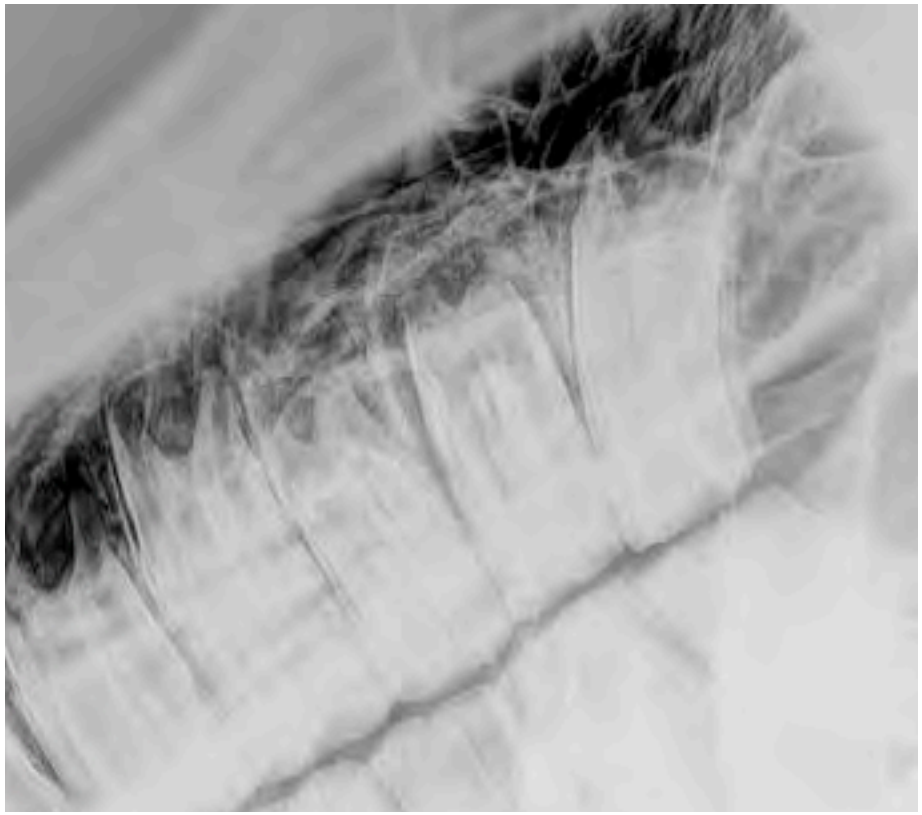
2 x Dorsolateral oblique (affected side)

Dorso-ventral

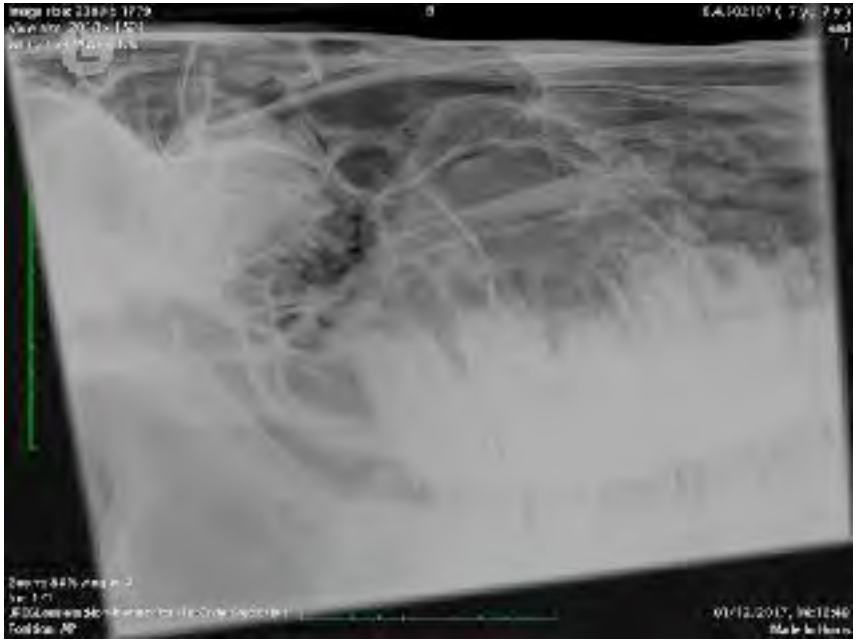
Dorsolateral oblique (contralateral side)

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Radiography



- Dental Y/N
- Sinus Disease Y/N



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Progression

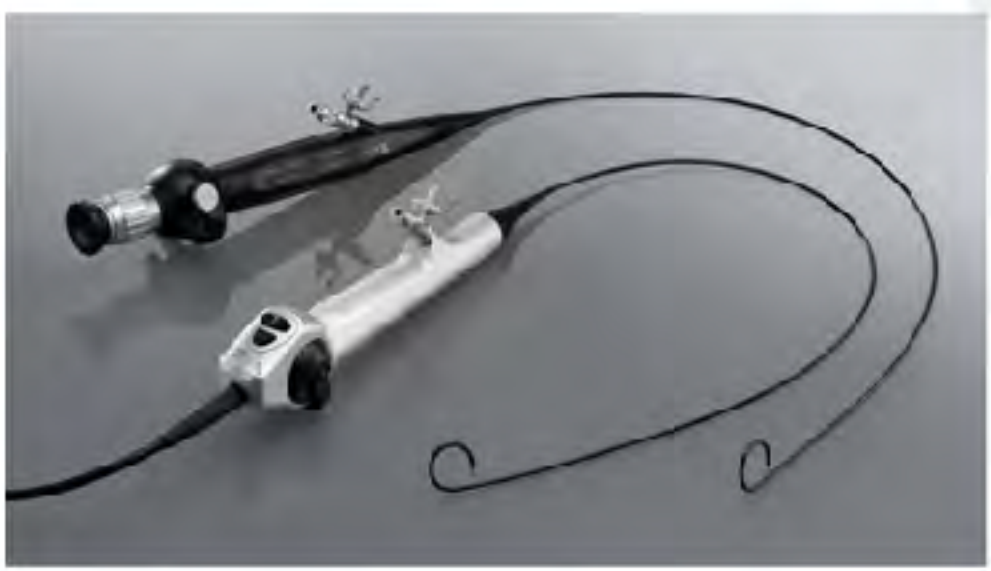




- Diagnosis Y/N
- Advanced Imaging required Y/N
- Direct Sinus Endoscopy
  - Diagnostic and therapeutic

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Sinus Endoscopy





- Can be performed per nasum with a 3mm endoscope
- Per nasum if sino-nasal fistula present
- Via trephination sites

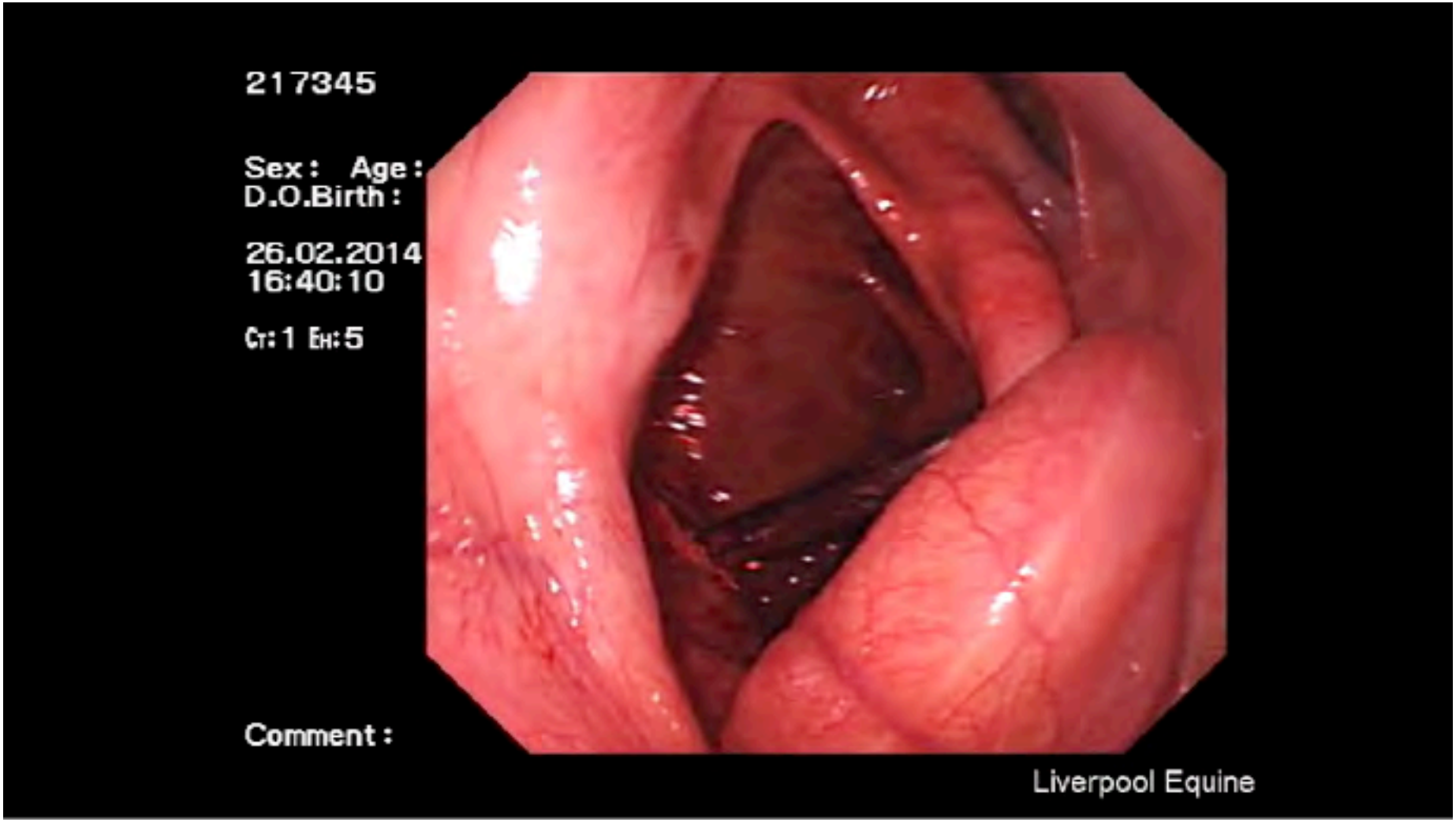
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Approaches

Approach	Sinuses viewed
Frontal	FR, DCS, CMS, SP
Caudal Maxillary	FR, DCS, CMS, (SP)
Rostral Maxillary	RMS, (VCS)

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Fenestration of Bulla



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Primary Sinusitis





- Usually a diagnosis of exclusion of dental/masses
  - Radiography
  - CT
- Chronic Primary usually involves RMS and VCS

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Sinoscopic lavage



- Attach diastema flusher to biopsy channel
- ‘Geysir’ ground control pedal



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Sinoscopic lavage



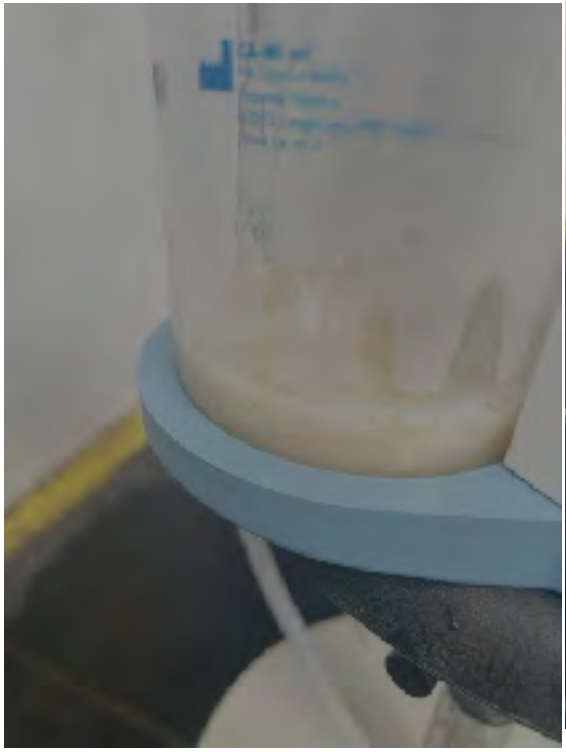
- Allows direct lavage

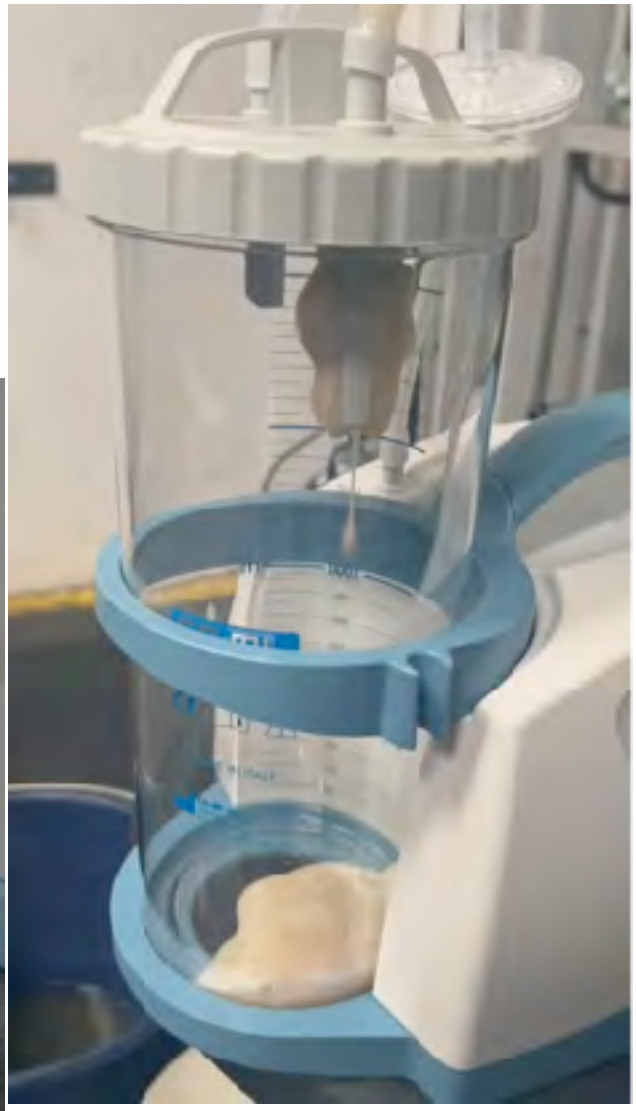


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Suction







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Systemic Treatment

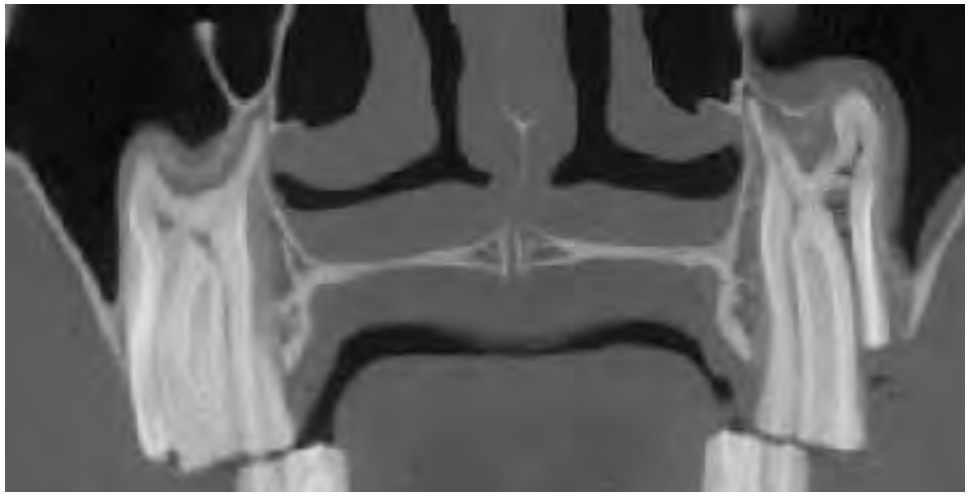




- In conjunction with lavage/inspissated pus removal
- Anti-inflammatories
  - NSAIDs
  - Steroids
- Antimicrobials
  - Doxycycline

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Dental Sinusitis

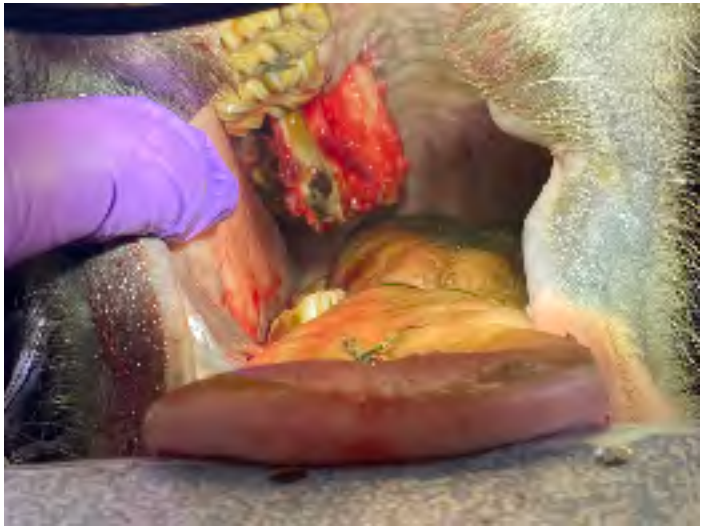


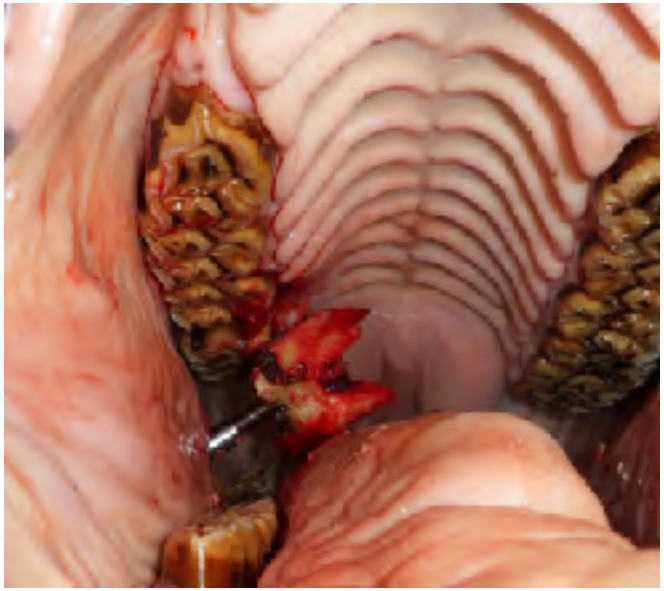


- Present generally similarly to primary
- Dental involvement
  - Oral exam
  - Imaging findings
- Treatment
  - Remove tooth

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Extraction





- Extraction methods
  - Oral extraction
    - Additional methods
  - MTE extraction
- Need to preserve alveolar bone plate

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Other causes of sinusitis

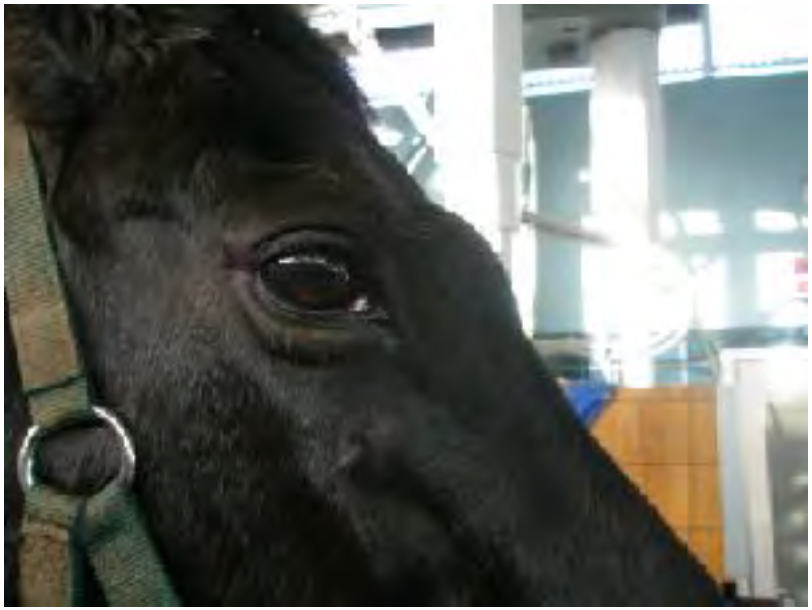


- Sinus Cyst
- Progressive Haematoma
- Mycotic Sinusitis (primary)
- Neoplastic

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Sinus Cyst





- Expansive, hollow structure in sinuses
- Expands bone and cartilage
  - External swelling
  - Nasal obstruction
- Non-neoplastic

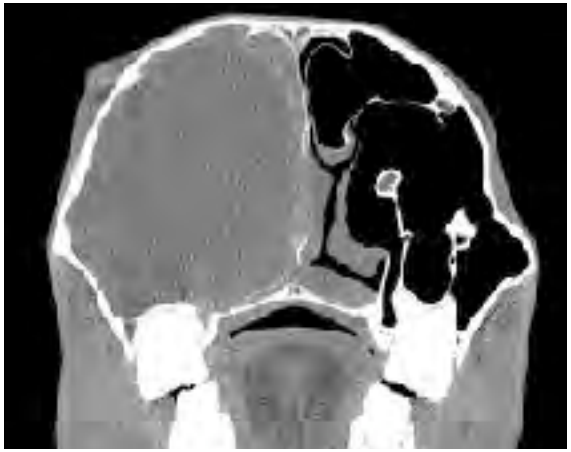
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Sinus Cyst









- Treatment by excision
- Often large by time of presentation
- Outcome determined by secondary effects
- Recurrence possible

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Fungal Sinusitis



- Increasing prevalence in my population
- Head shaking or intermittent epistaxis (low volume)
- Can be difficult to diagnose

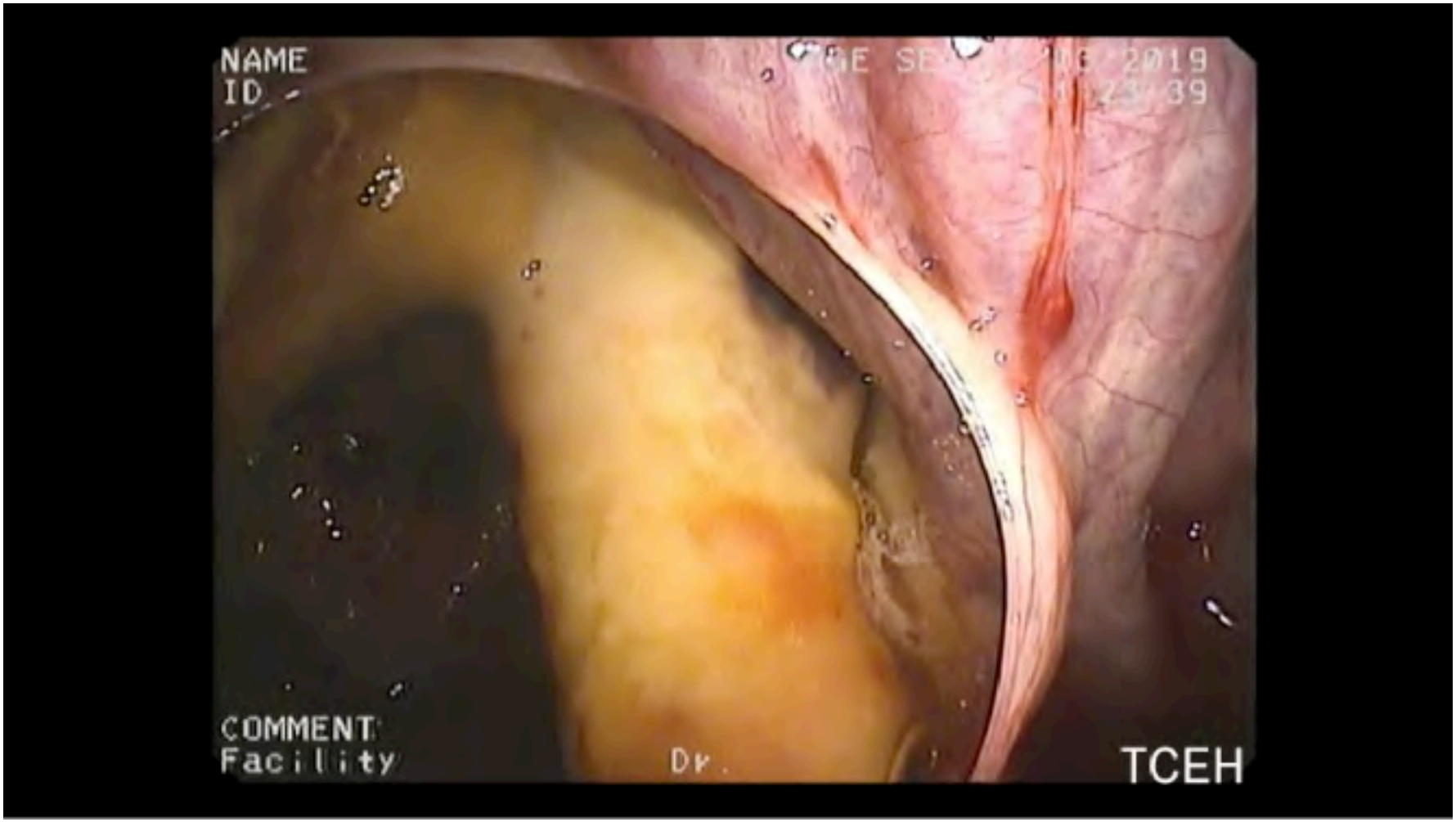
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Fungal Sinusitis



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Fungal sinusitis



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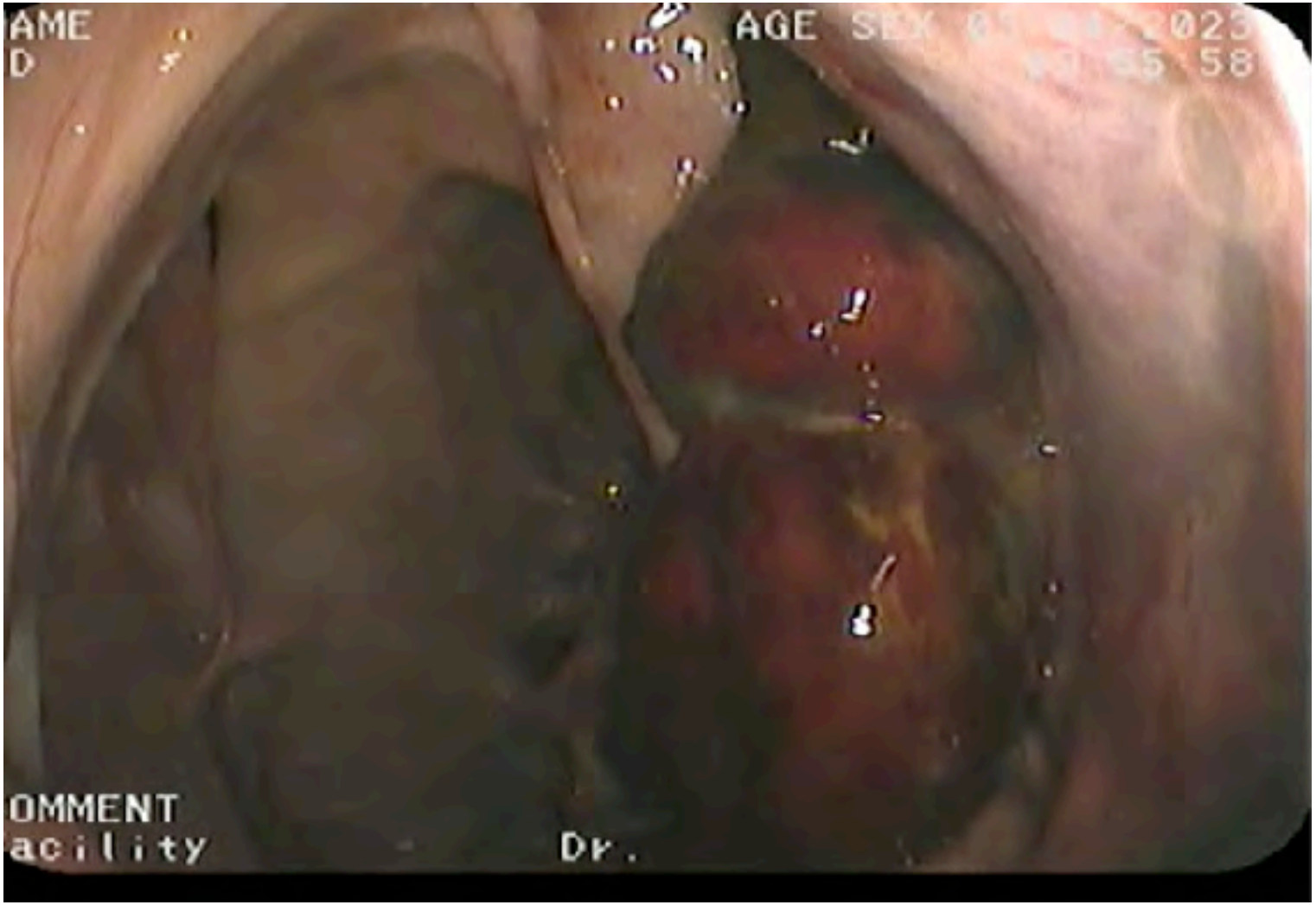
Progressive Haematoma



- More likely to be present in the nasal cavity
- Can be present in the sinuses as well
- Intrasinus lesions difficult to treat

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Progressive haematoma



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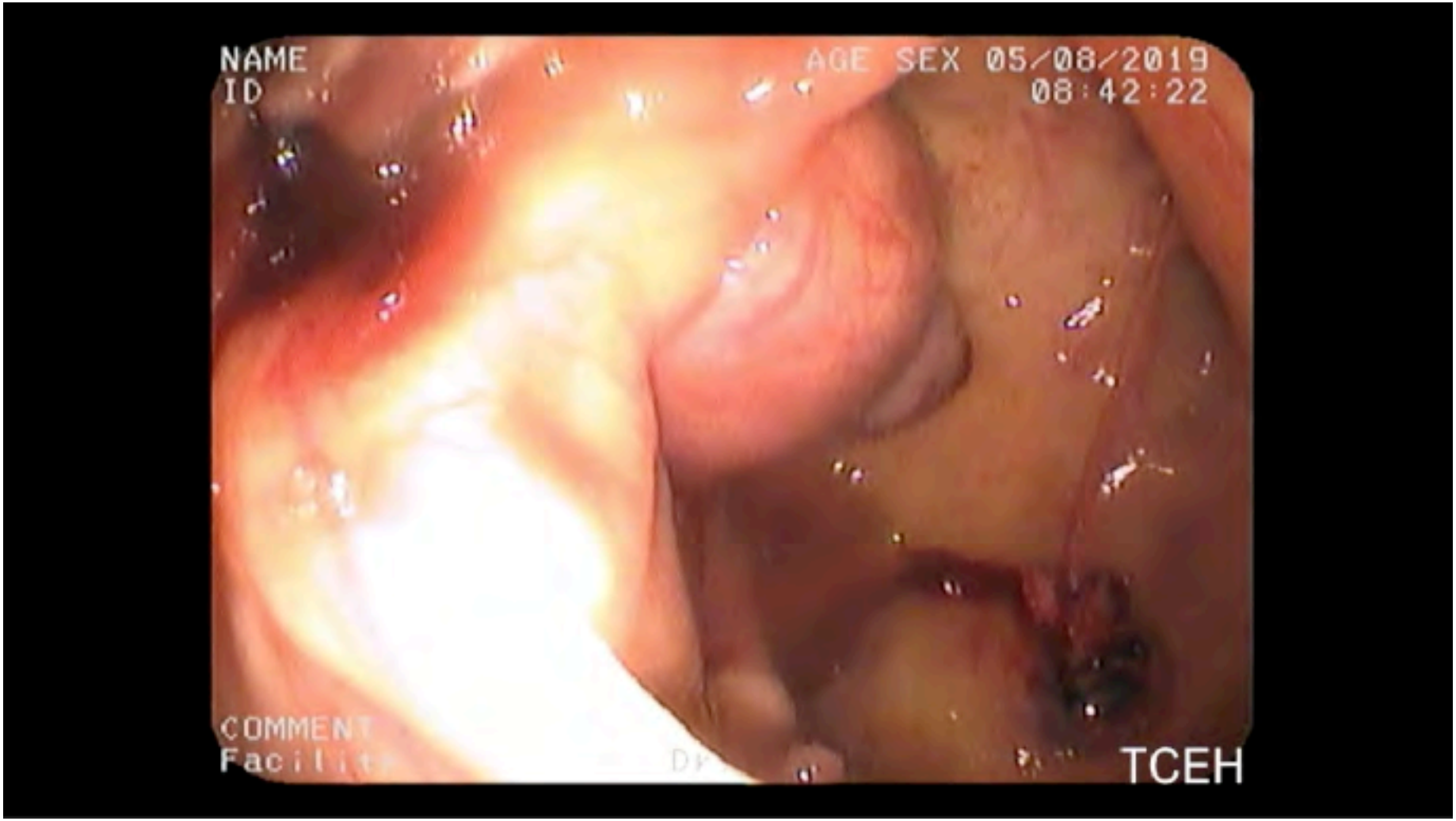
Neoplastic



- Thankfully rare diagnoses
- Usually present with facial swelling
- Localised masses can be excised
- Radiotherapy options

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Sinus Mass



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Outcomes

Factor	Group	Total recorded	*N* outcome recorded	*N* cured	% cured
Final diagnosis	Primary sinusitis	329	172	131	76.2
	Dental sinusitis	729	410	318	77.6
	Mycotic sinusitis	65	40	32	80.0
	Sinus cyst	178	106	74	69.8
	PEH	100	71	32	45.1
	Traumatic sinusitis	90	54	42	77.8
	Sinonasal tumour	86	54	5	9.3

Conclusions: Equine sinonasal disease cases aged over 12 years old, with disease of over 8 weeks duration or having had nasofrontal sinusotomy prior to referral had a decreased chance of complete cure following referral.

Conclusions: Maxillary cheek teeth endodontic/apical infection does not always cause sinusitis. Sinus bone hyperostosis and caudal group sinusitis are associated with a lower likelihood of cure, whereas apical infections are associated with a higher likelihood of cure.

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Take home messages

- Determine source of discharge
- Just unilateral nasal discharge
  - Dental vs Primary Sinusitis
- Facial swelling/epiphora/nasal obstruction
  - Sinus Cyst or Neoplasia
- Nasal smell but minimal discharge
  - Nasal disease
    - Could be dental in origin
- Decrease inflammation!



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Questions





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