



# THAT STINKS

Oral tumors in dogs & cats

# Stacy Santoro

## Bins to c k

DVM, DACVIM (Oncology)



# TODAY'S PLAN

Oral tumor basics

Odontogenic tumors

Melanoma

SCC

OSA

FSA

# ORAL TUMORS

- More common in dogs vs cats
- Male sex predilection
- Variable biologic behavior
- Middle aged/older animals
- H/O dental disease, loose teeth, bad breath
- Melanoma – dogs
- Squamous cell carcinoma – cats



# BASIC PROGNOSTIC INDICATORS

Size

Large

Location

Caudal mouth, maxilla

Tumor Type

Melanoma, cat SCC

Stage

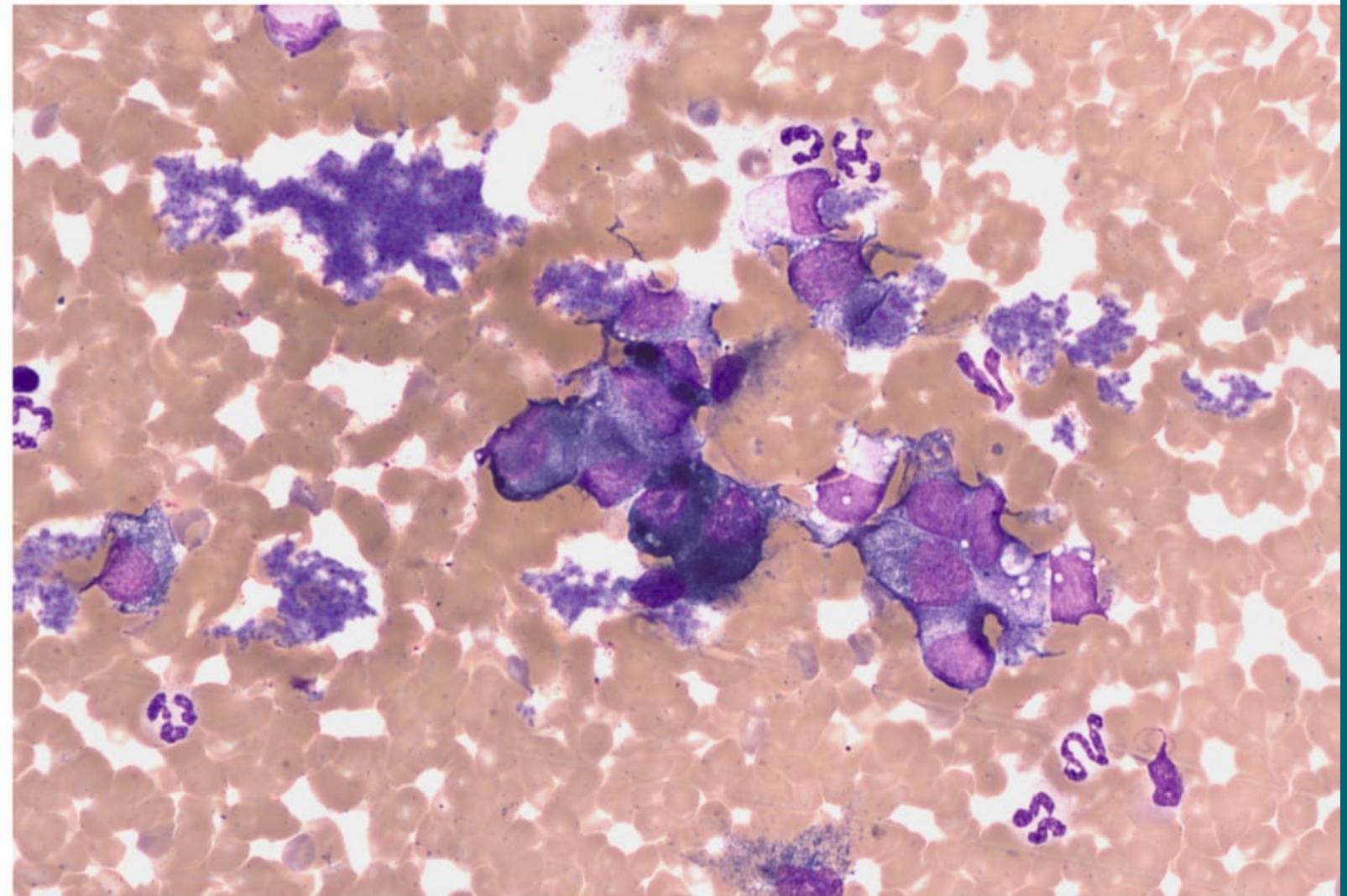
Distant metastasis



# DIAGNOSTICS - FNA



## Images



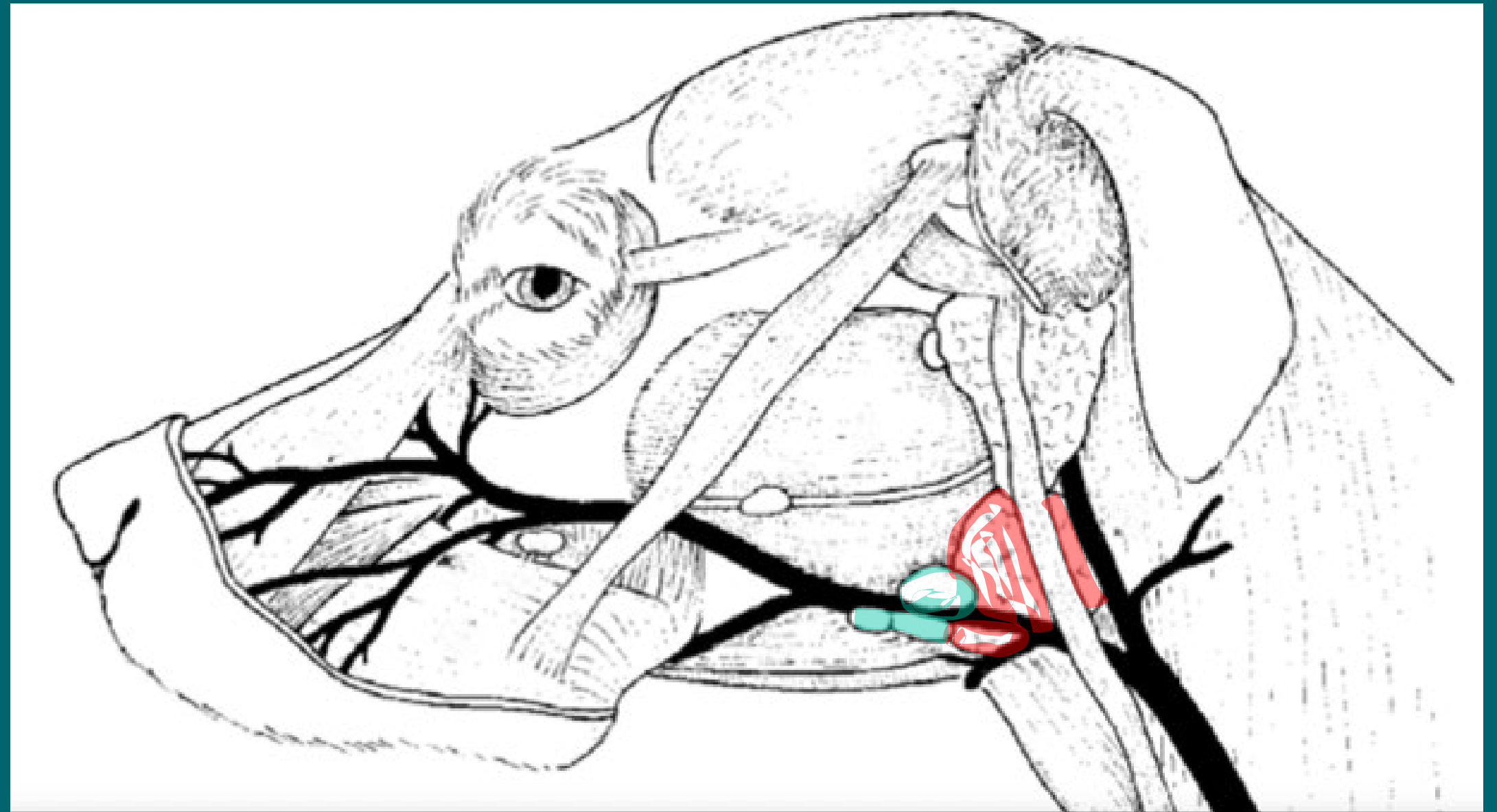
Oral mass: Several moderately granulated melanocytes with large eccentric nuclei

2023-01-20 12:23:28

# DIAGNOSTICS - FNA

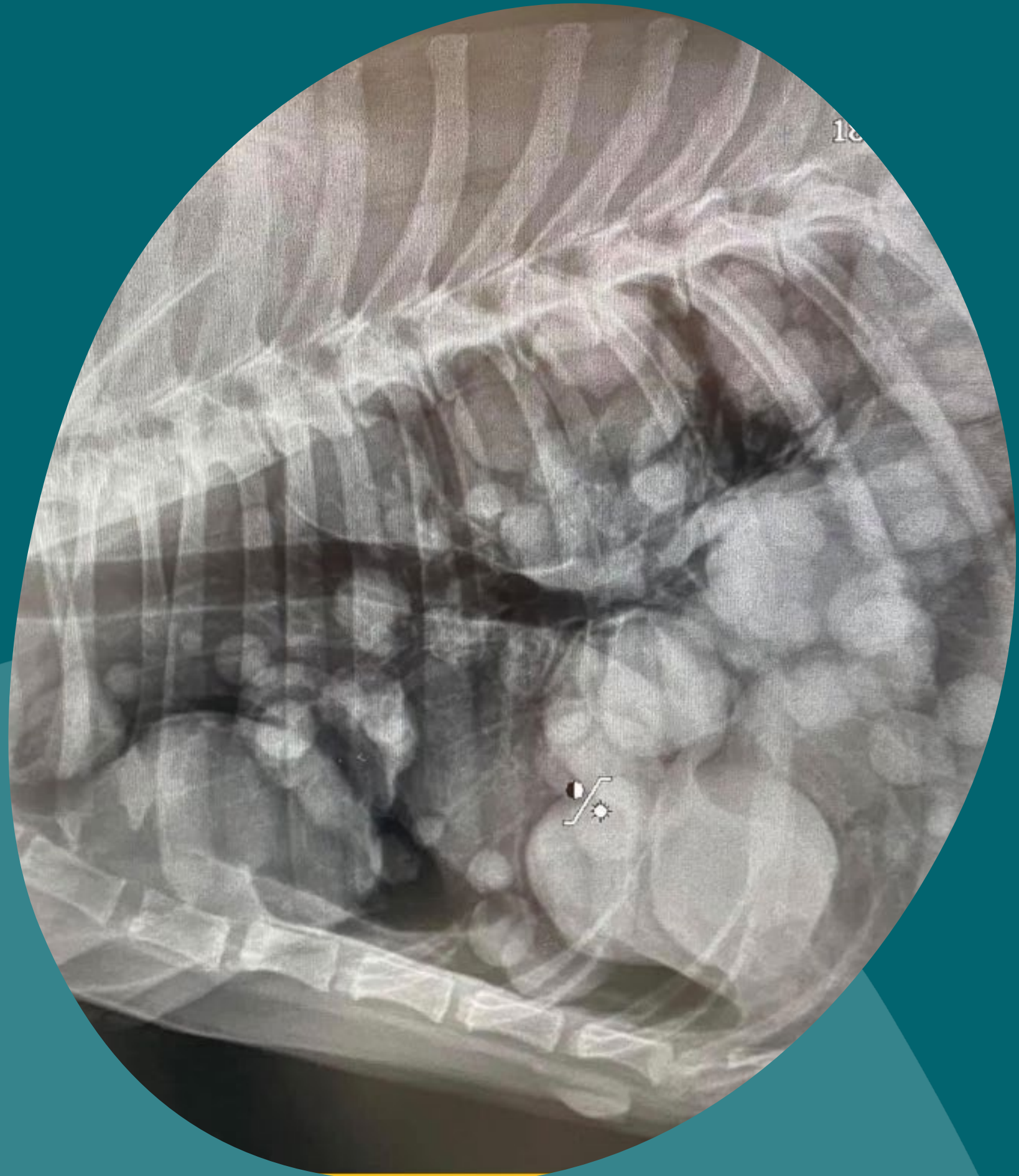
First...you have to find them

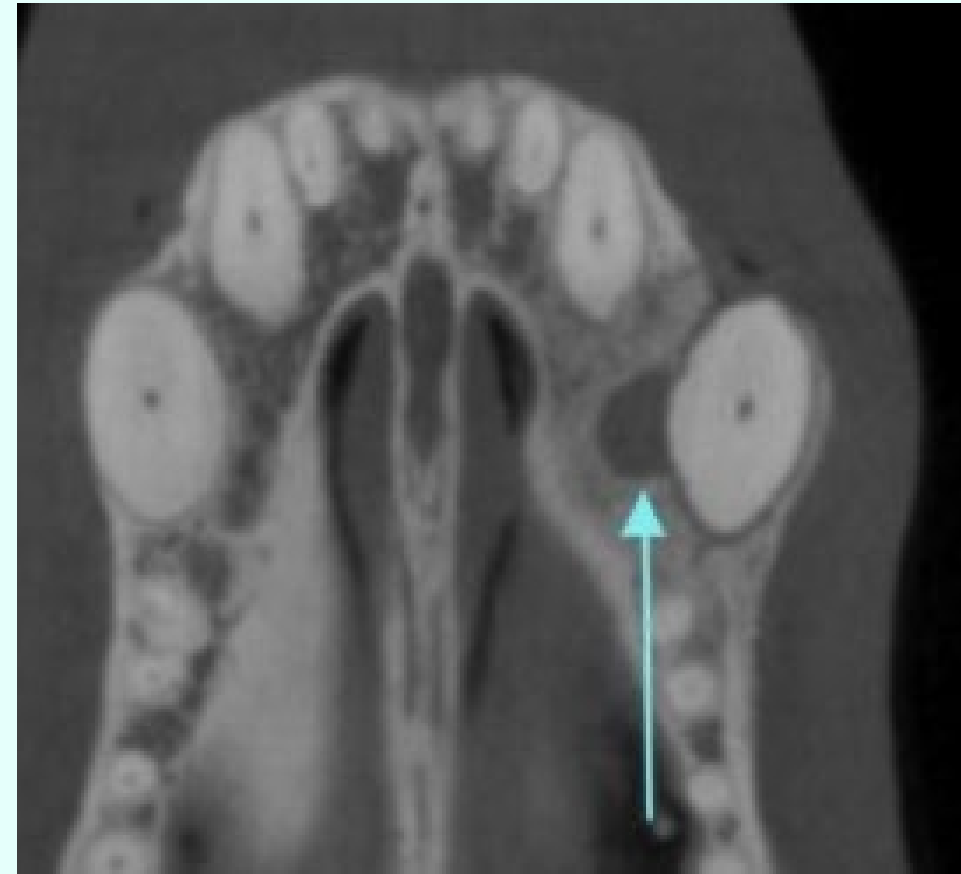
- Salivary gland: more caudal and tucked under the ramus
- Slide hand rostral & ventral to find the node
- Feel them from behind
- Less restraint is better
- Hold onto it tightly to FNA



# DIAGNOSTICS

- Chest radiographs
- Imaging of the mouth
- Dental radiographs
- Cone beam CT
  - Lower radiation dose
  - Cheaper
  - Fast
  - Mobile
  - Excellent bone detail
    - Less soft tissue visualization
  - Thinner sections
  - 3D visualization/reconstruction
- CT can
  - Better if large soft tissue component
- Biopsy (more info ahead)

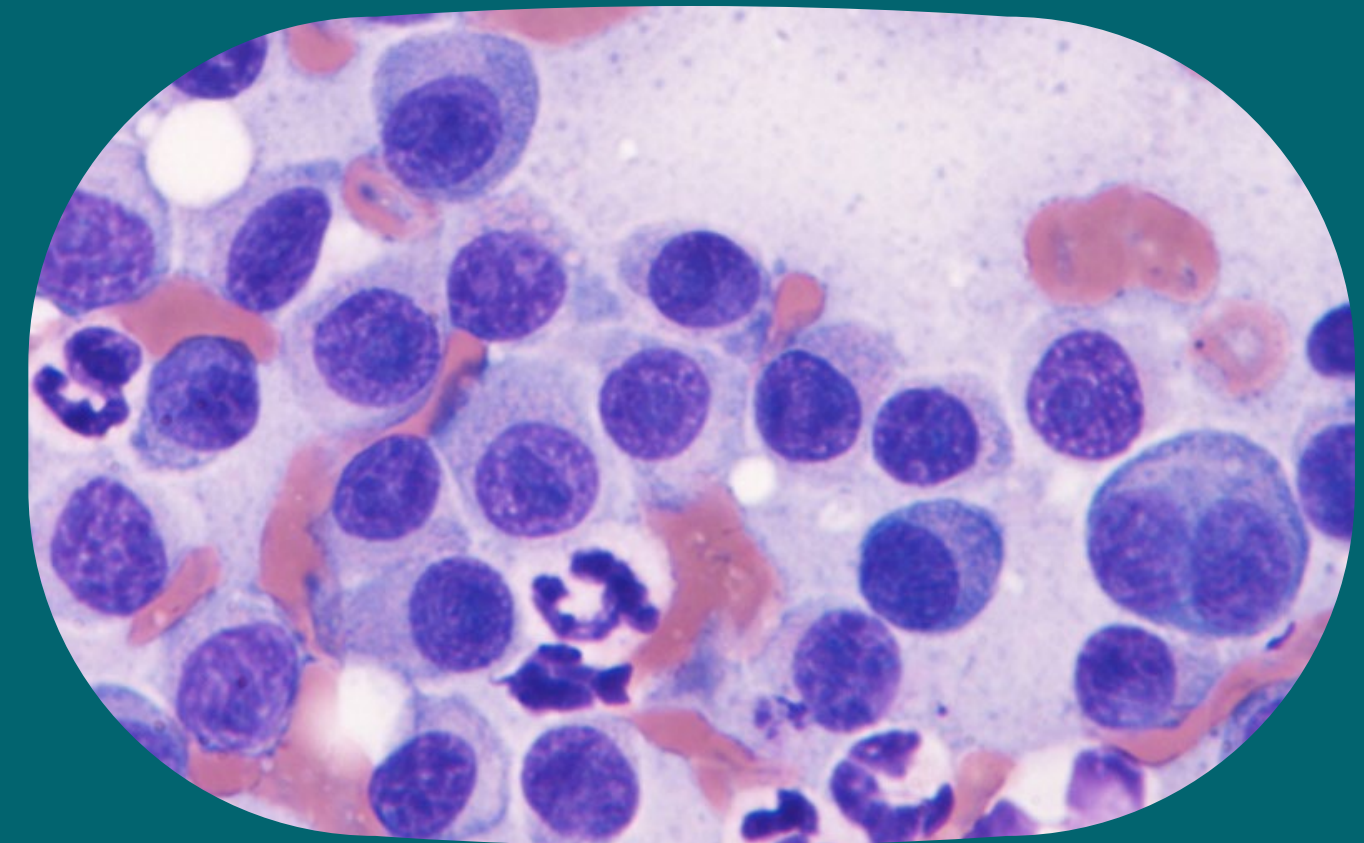


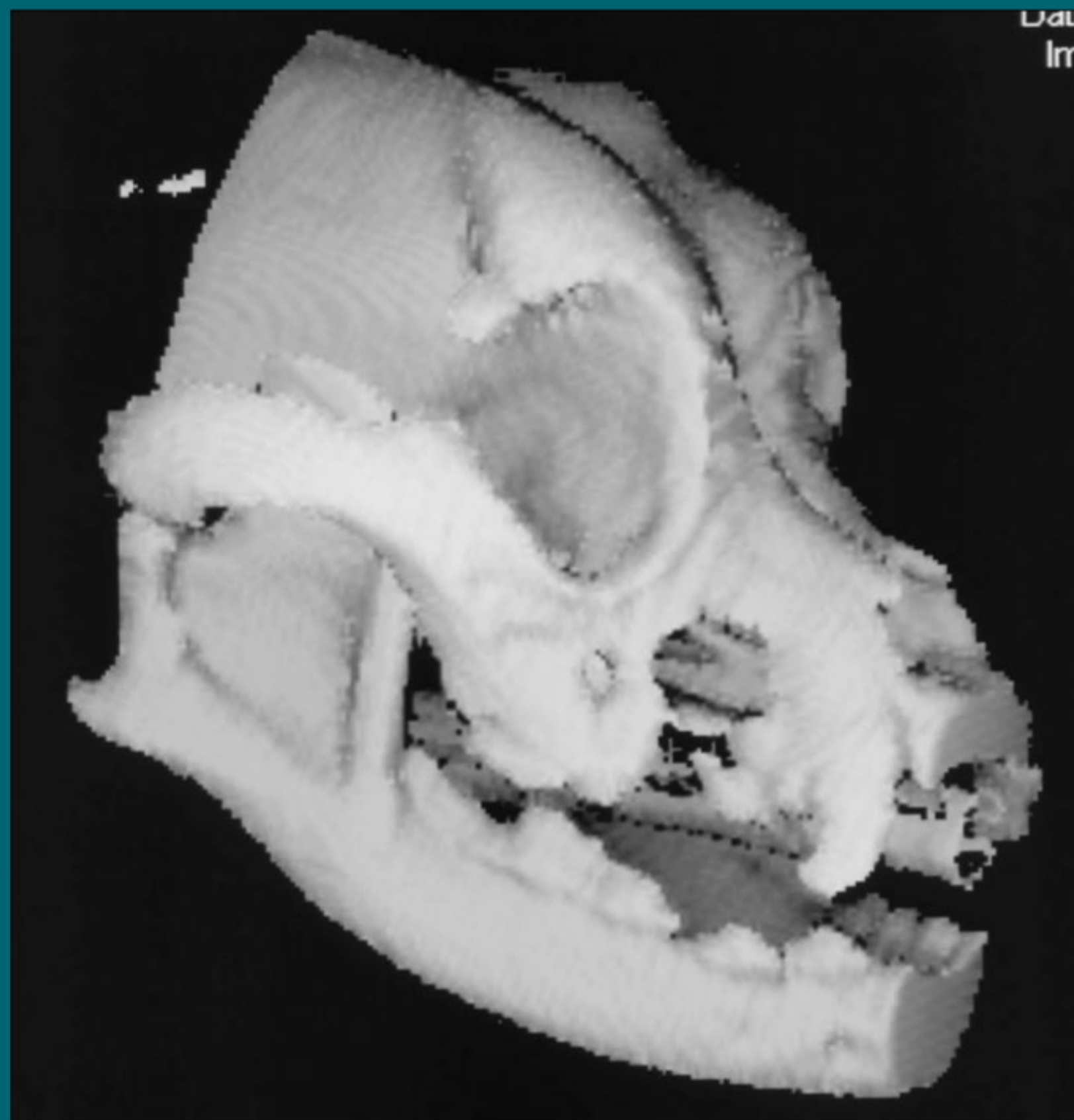
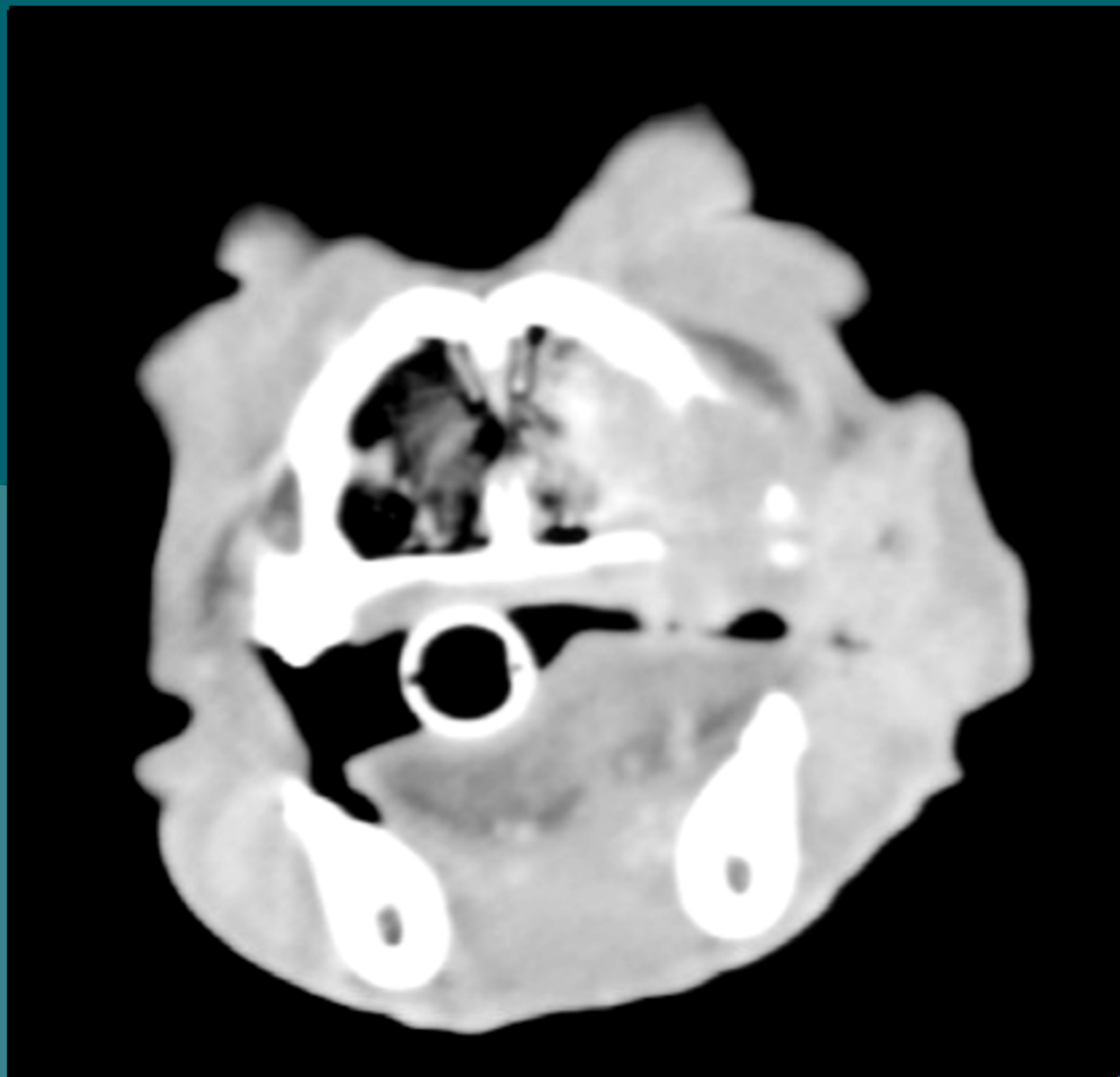


[www.veterinarydentalcenter.com](http://www.veterinarydentalcenter.com)



PLASMA CELL TUMOR



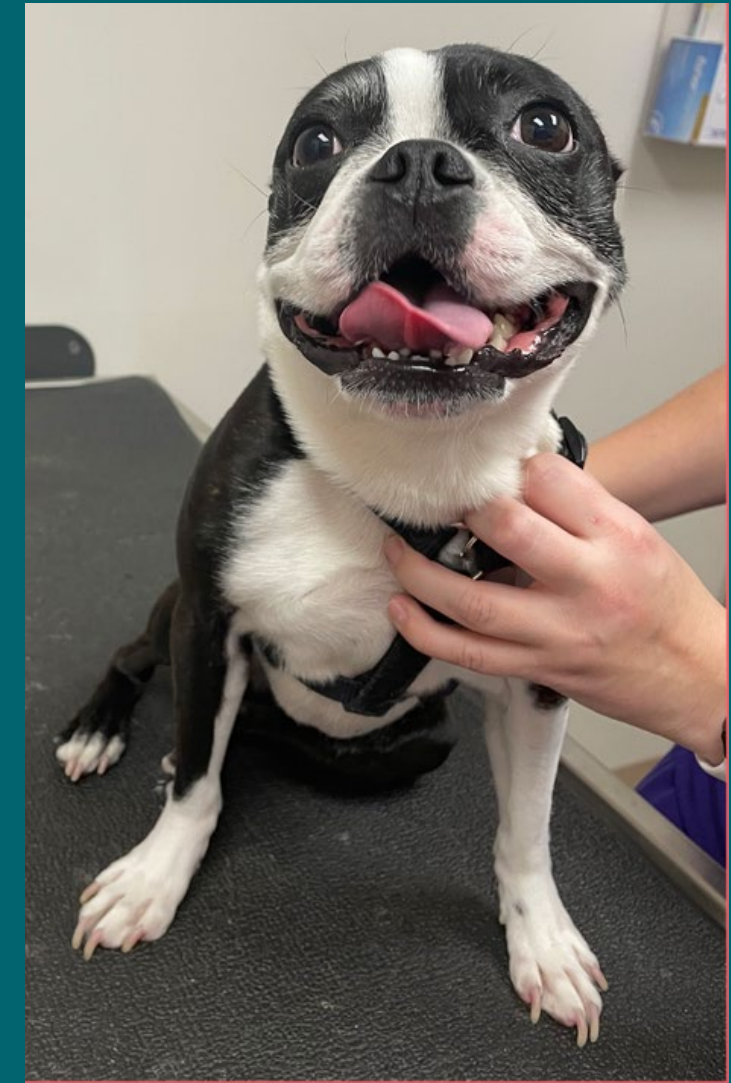


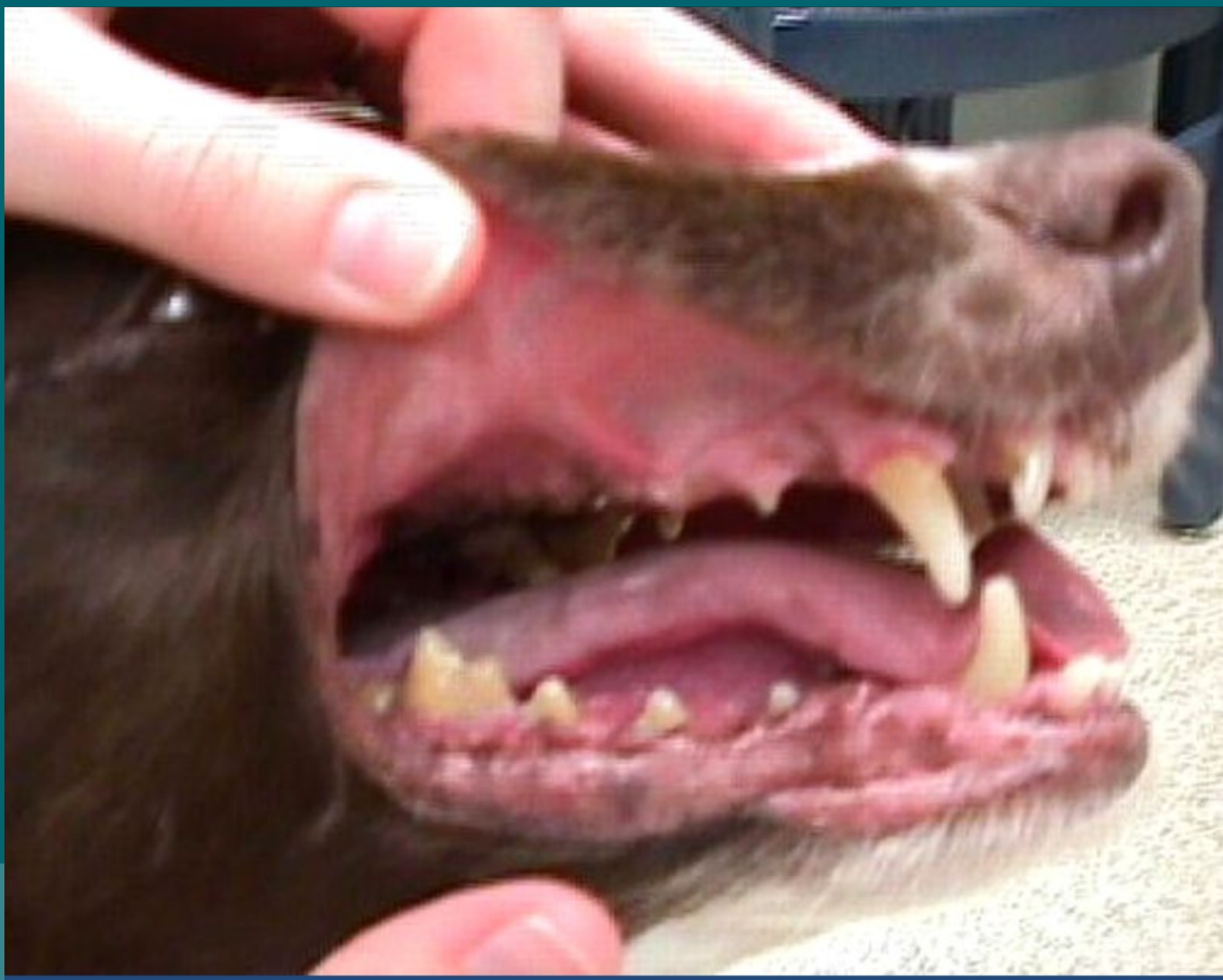
Data  
Im

# TREATMENT OPTIONS

## Surgery

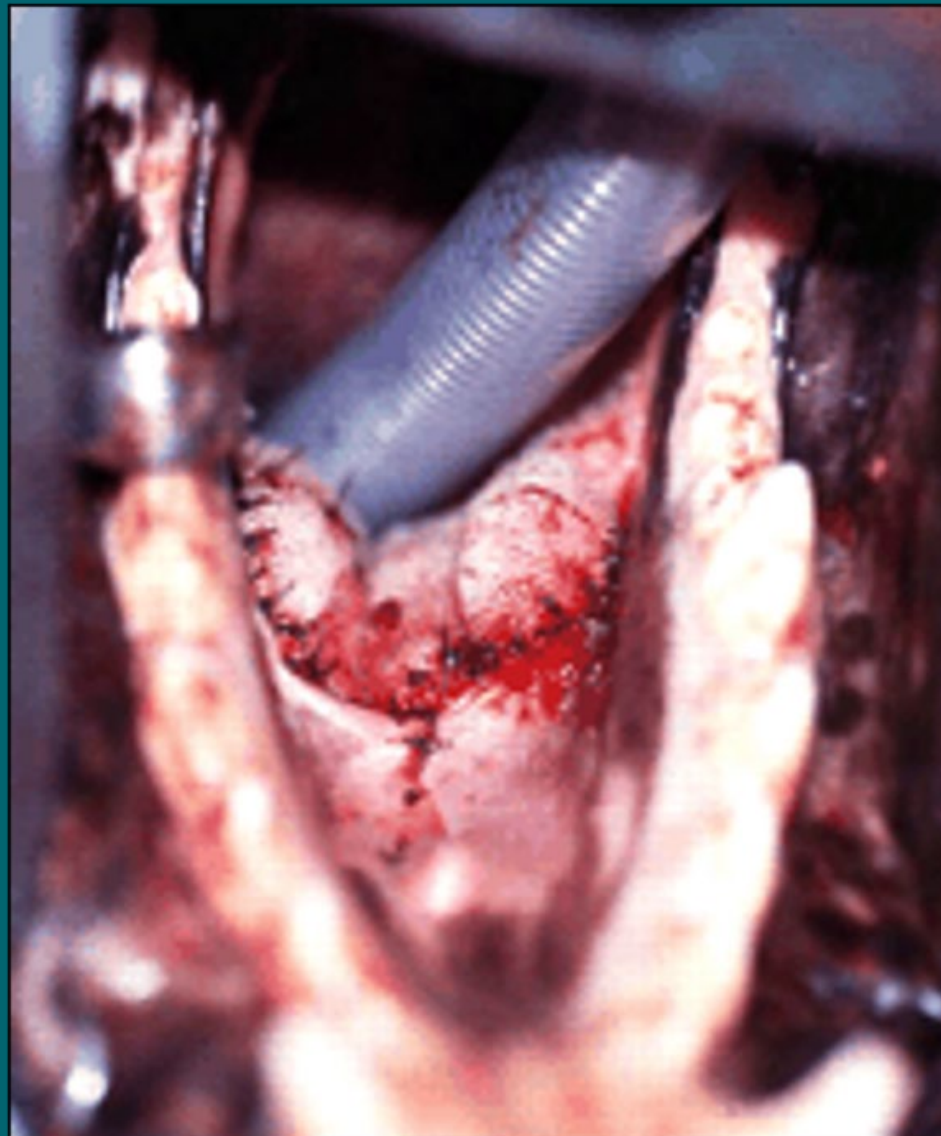
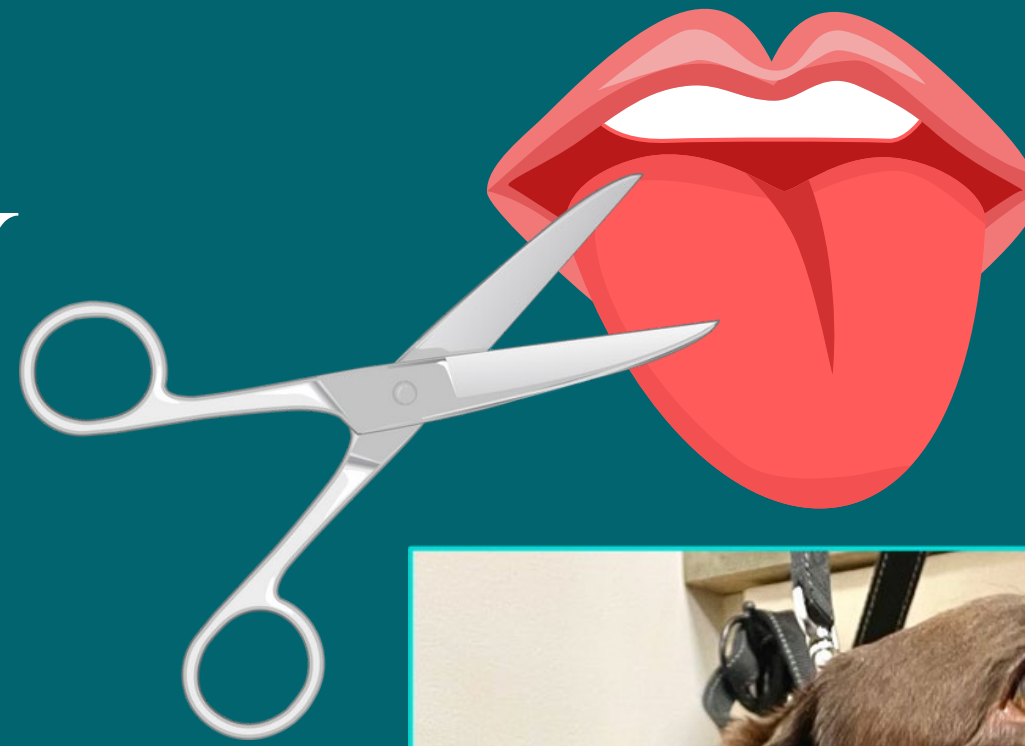
- Main option for all oral tumors in dogs and cats
- Look to see if it crosses midline
- Not done as often in cats
- 2 cm margins
- Removal of bone
- Owner satisfaction high
- 85%
- Tongue hangs out





# MAJOR GLOSSECTOMY

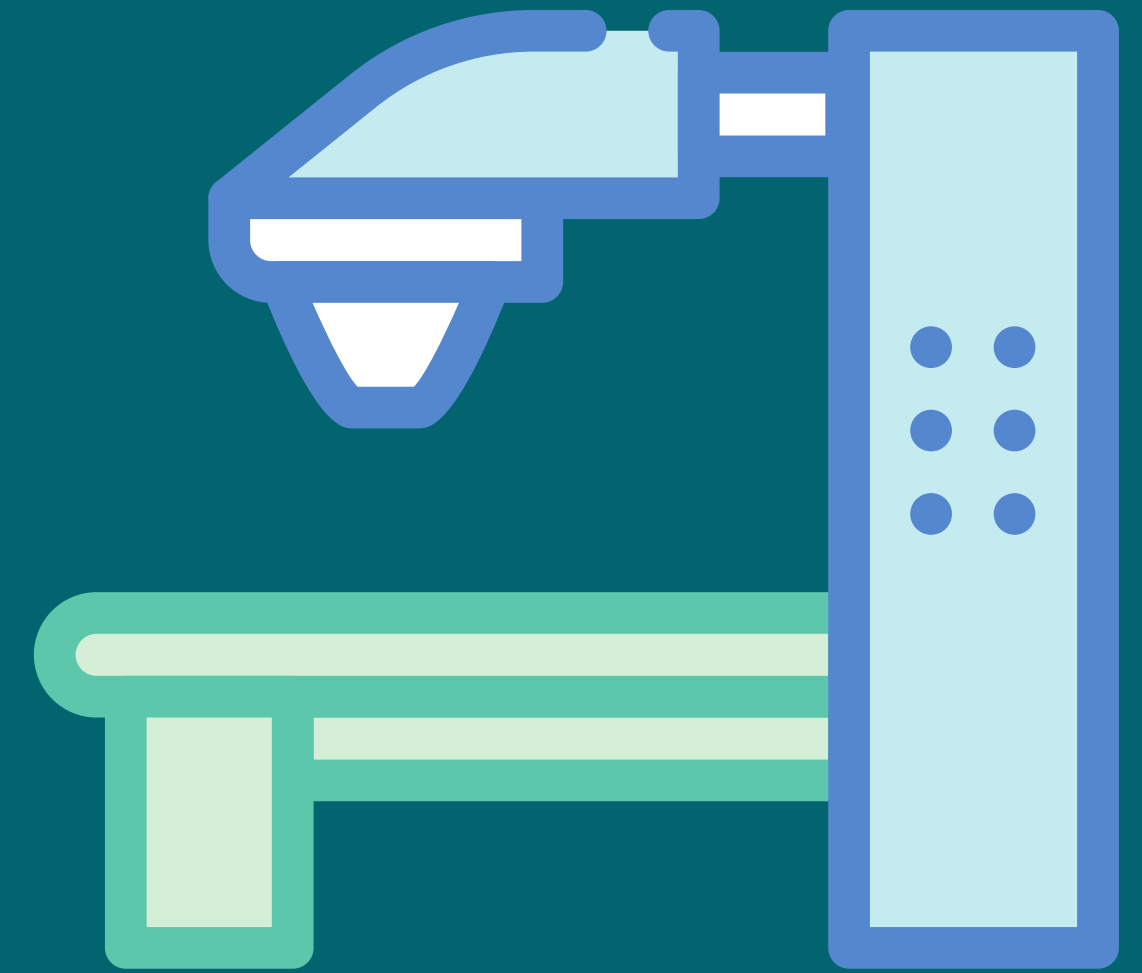
- Removal of ~80% of tongue is possible
- Partial, subtotal, near total
- Flip food to back of tongue
- MESSY eaters & drinkers



# TREATMENT OPTIONS

## Radiation therapy

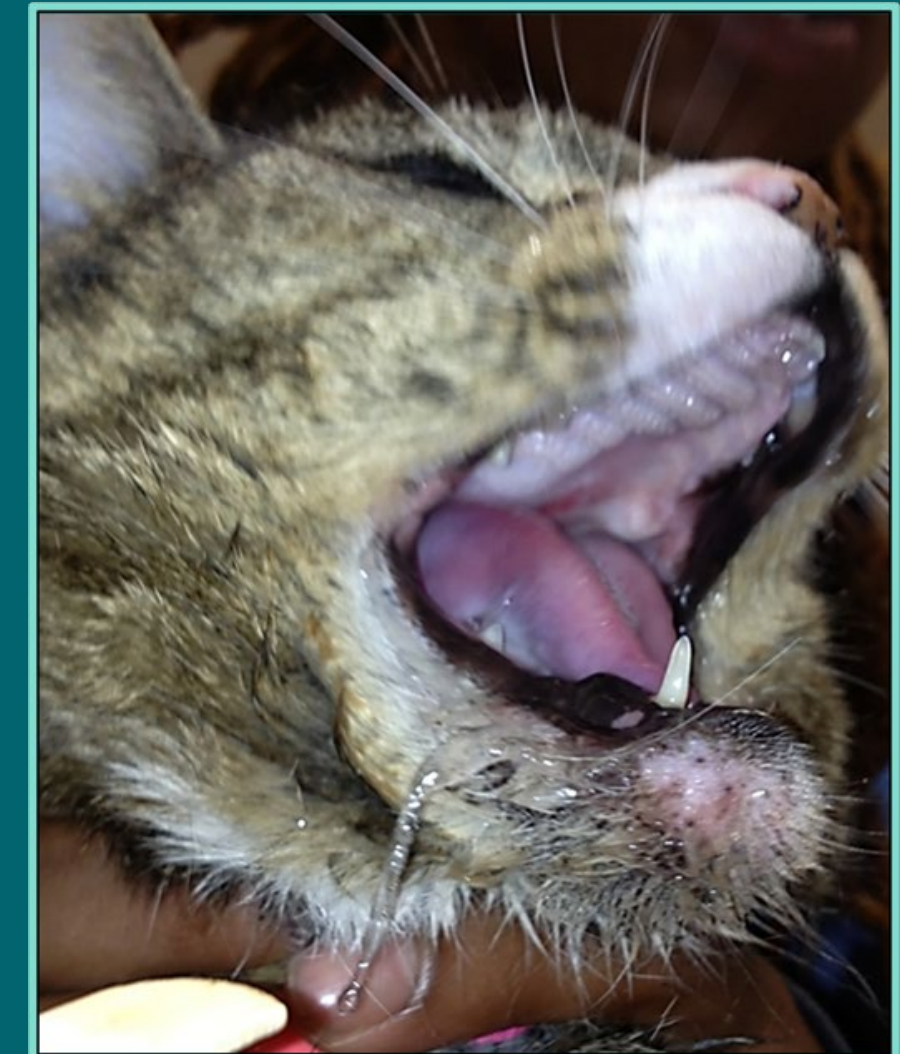
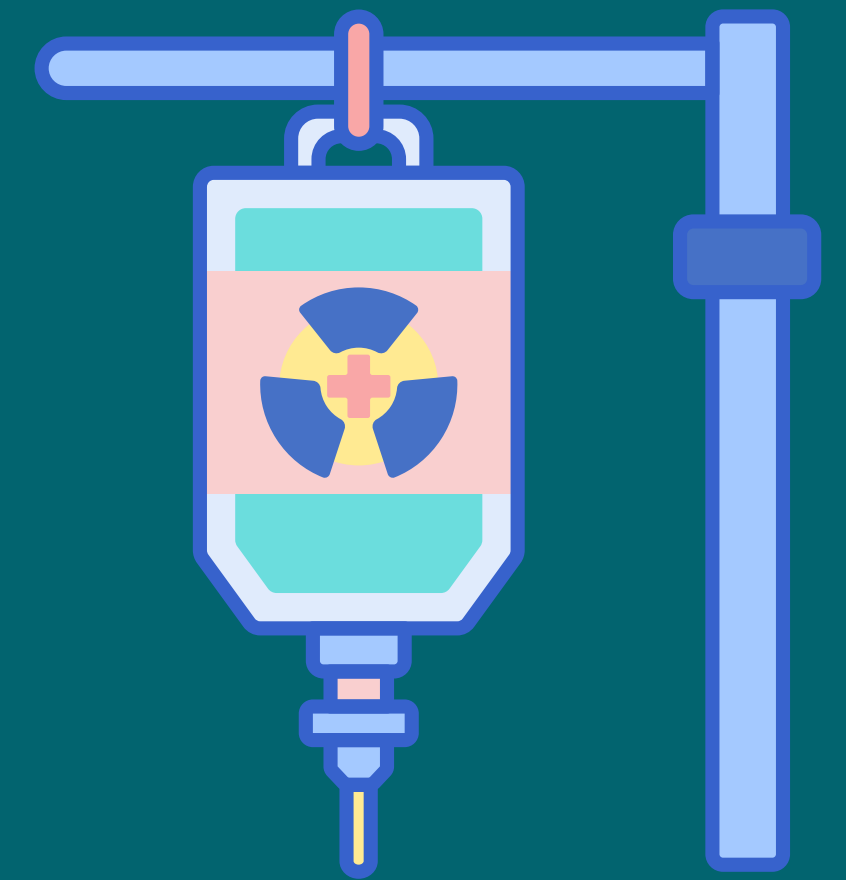
- Local tumor control when surgery isn't possible
- Indication
  - After incomplete excision
    - 15-20 treatments
    - Side effects: mucositis
  - Managing a bulky tumor that can't be removed
    - 2-4 treatments
    - Few short term side effects
    - Shorter duration of control
- Always requires anesthesia
- Think about cost and location



# TREATMENT OPTIONS

## Chemotherapy

- Primary used to delay metastasis
- Indication
  - High, aggressive grade tumor
  - No other good options
  - Helpful for round cell tumors
- Not a good option for m e l a n o m a
  - M e l a n o m a is c h e m o r e s i s t a n t



# REFERRAL CONSIDERATIONS

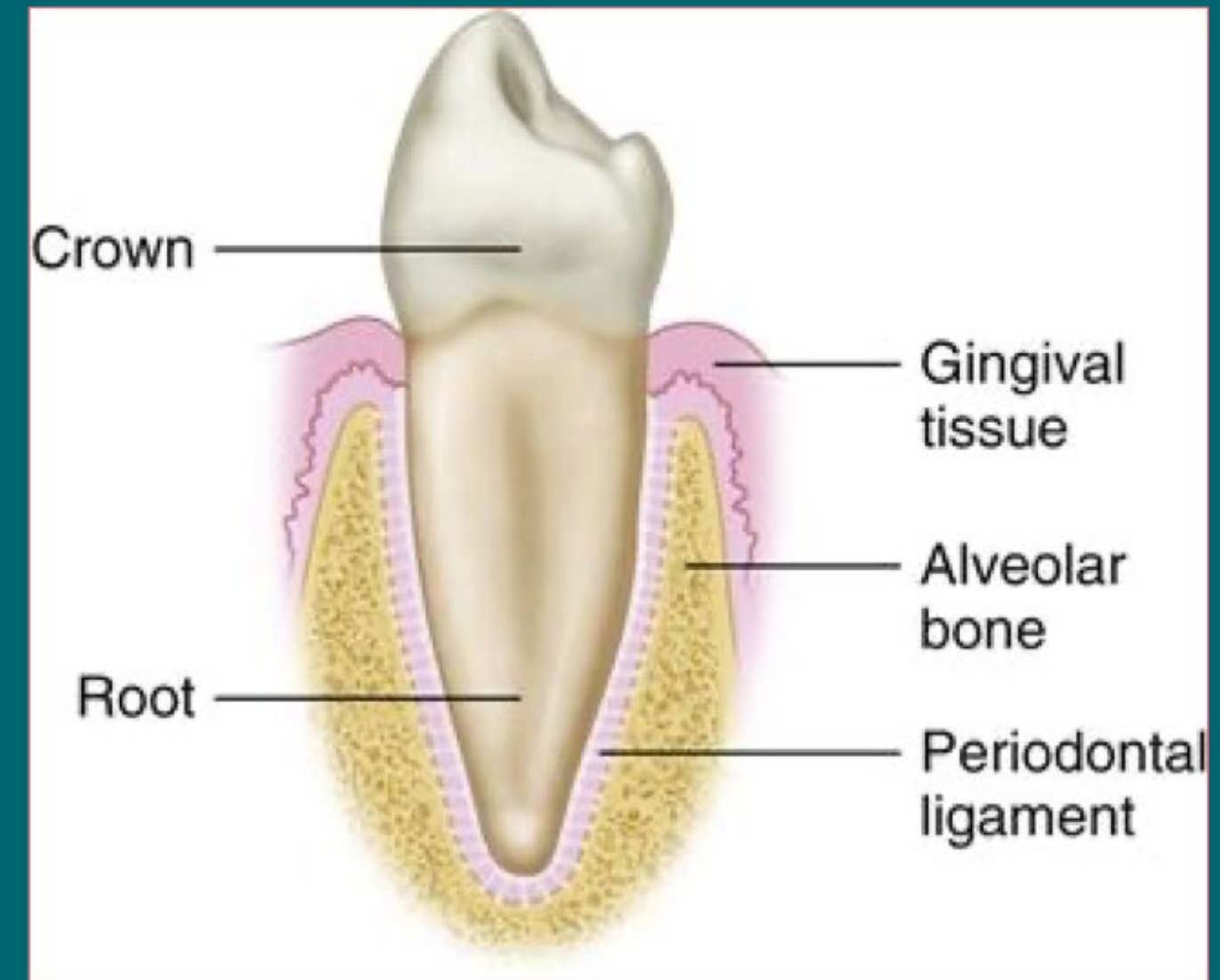
- Refer early
  - $< 2$  cm
- Chest radiographs prior
- Incisional biopsies
  - Full thickness
    - Diagnostic miss - inflammation/infection only
- Wedge / pizza slice
  - Take a piece  $> 4$  mm
- Oral pathologist
  - Specialty Oral Pathology for Animal (SOPA)
    - <http://www.sopforanimals.com>
  - Antech has oral pathologists



# CANINE ODONTOGENIC TUMORS (Epulides)

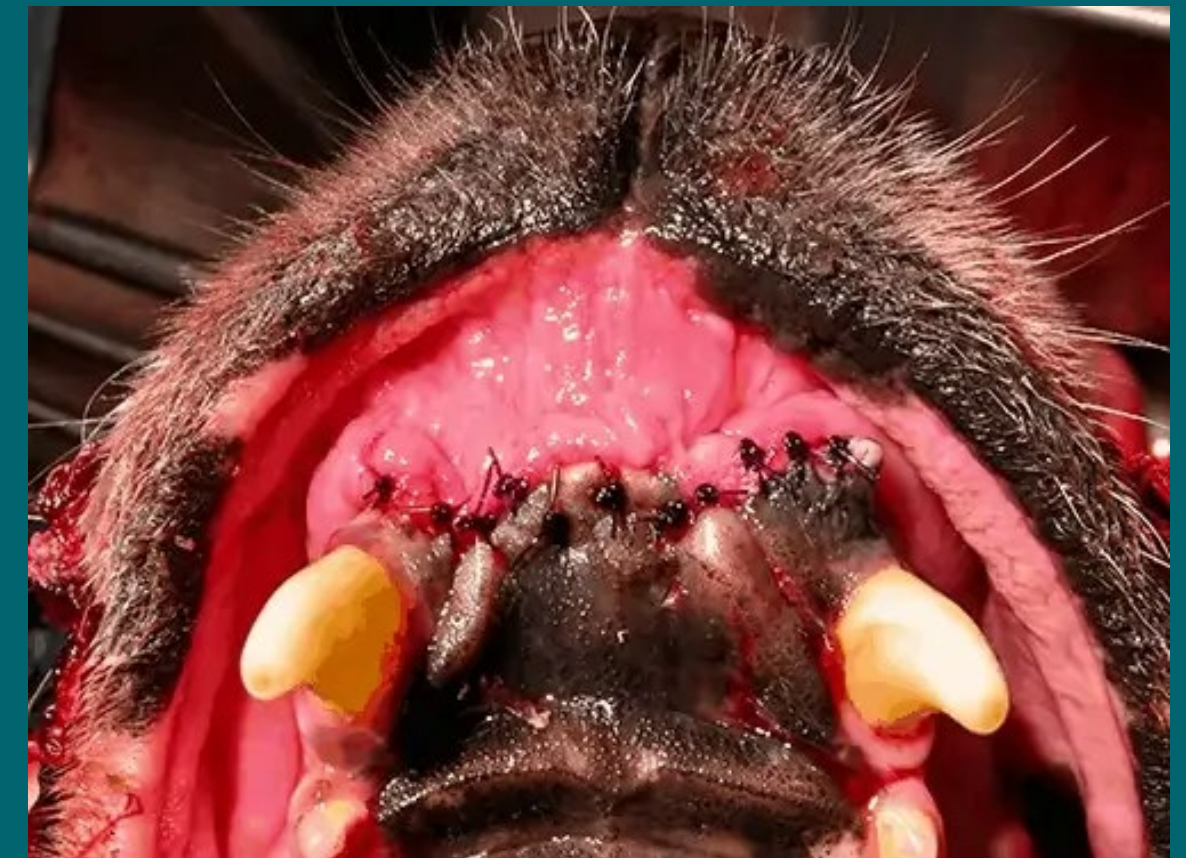
- Epulis is an outdated term
- “Growth on the gingiva”
- Arise from the periodontal ligament
- Holds the tooth into the jawbone
- Firm growths on the gingiva

- Peripheral odontogenic fibromas
- Fibromatous epulis
- Ossifying epulis
- Acanthomatous ameloblastoma



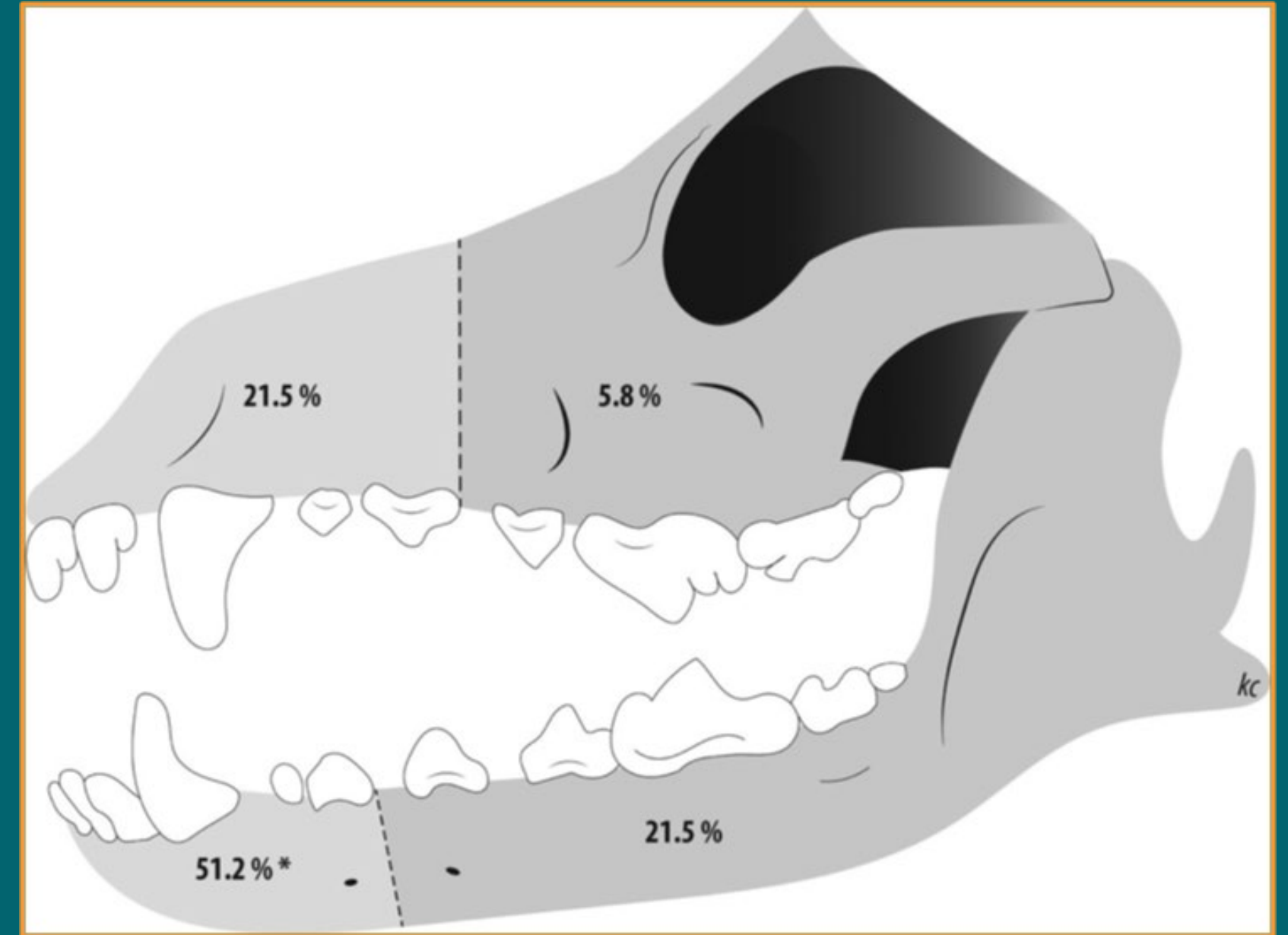
# ODONTOGENIC FIBROMAS

- Benign
- Slow growing
- Brachycephalic breeds
- Proliferative gingival lesion
- Firm, intact gingival epithelium, +/- fixed
- Do not invade bone
- Treatment: “conservative” surgery
- Prognosis: excellent



# CANINE ACANTHOMATOUS AMELOBLASTOMA (CAA)

- F > M
- Goldens, Shelties, Cocker Spaniels
- Rostral mandible
- Red, raised, irregular, ulcerated
- INVASION OF BONE
- Do not metastasize
- Aggressive but benign



# CAA TREATMENT OPTIONS

## Aggressive surgery

- Bone must be removed
- 1 cm margin
- Narrow may be enough

## Radiation therapy

- Radiation responsive
- Control rate > 90%

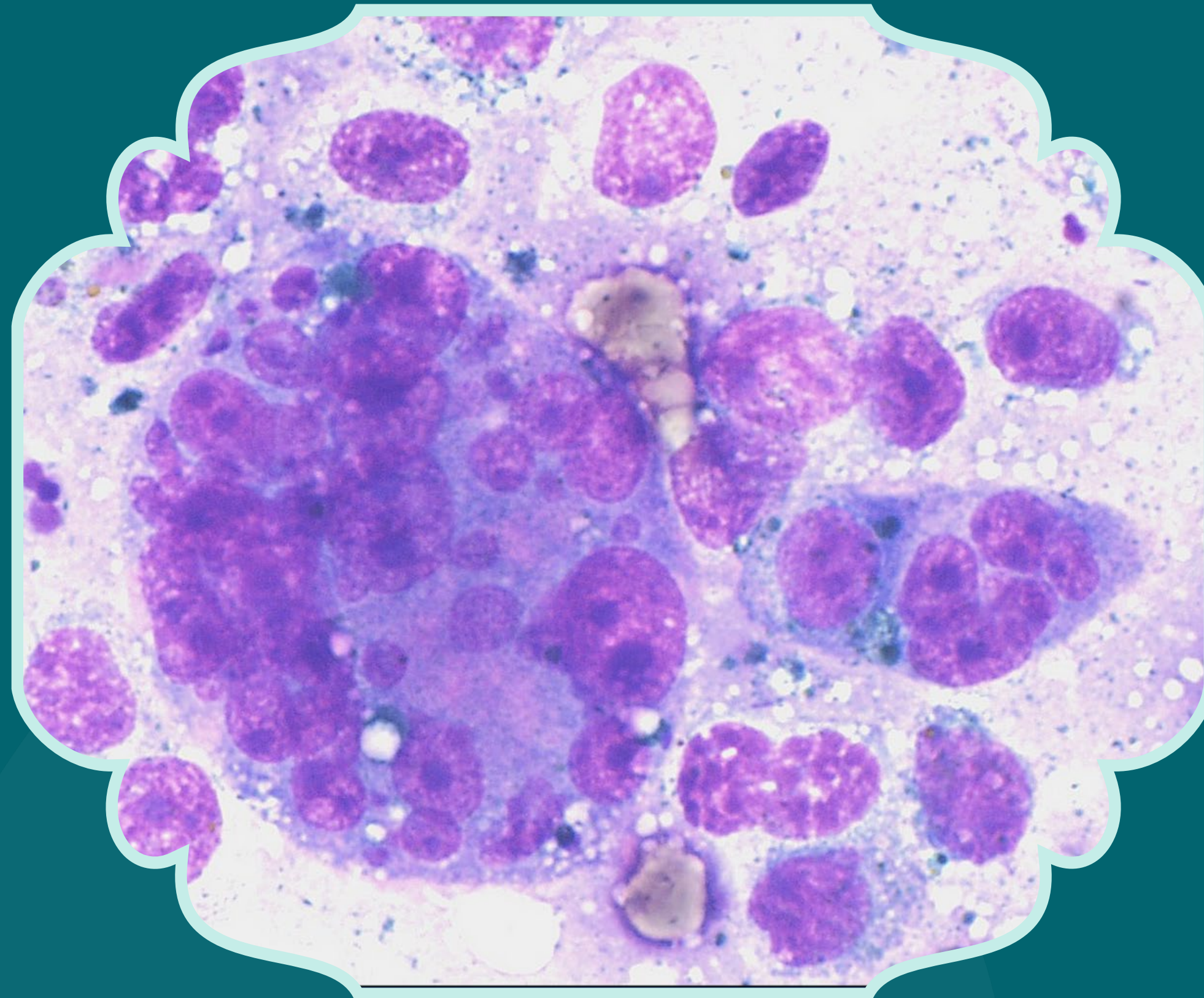
**LOOKING!  
GOOOOOD!**



## Prognosis

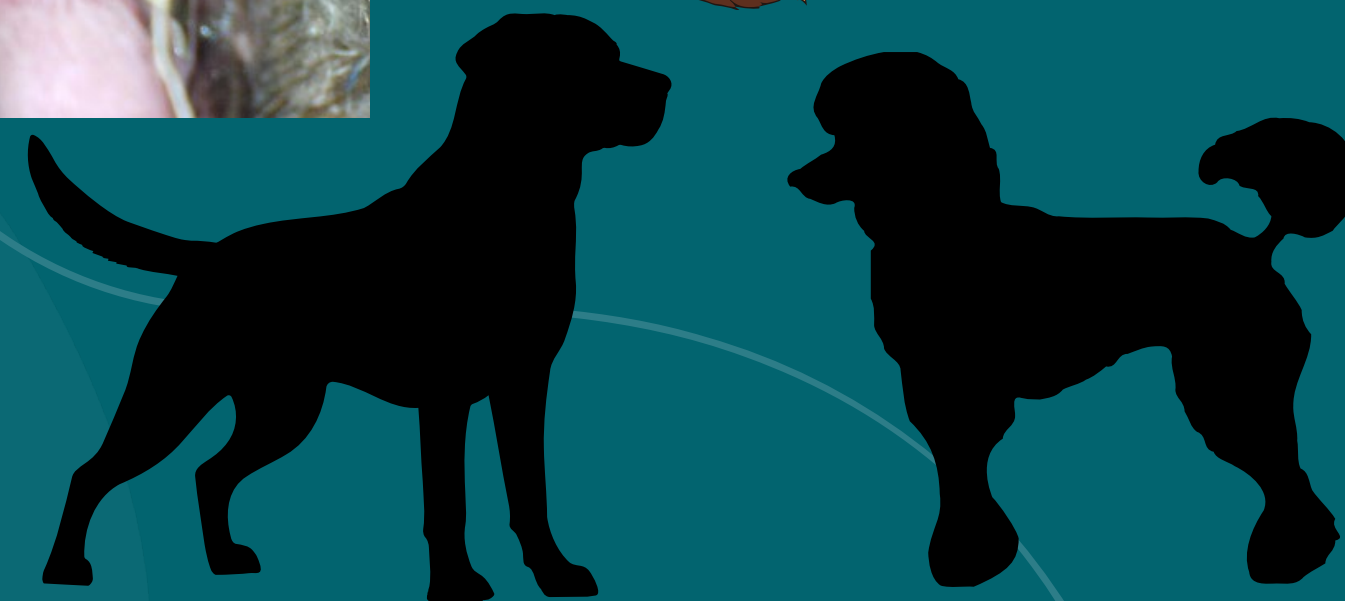
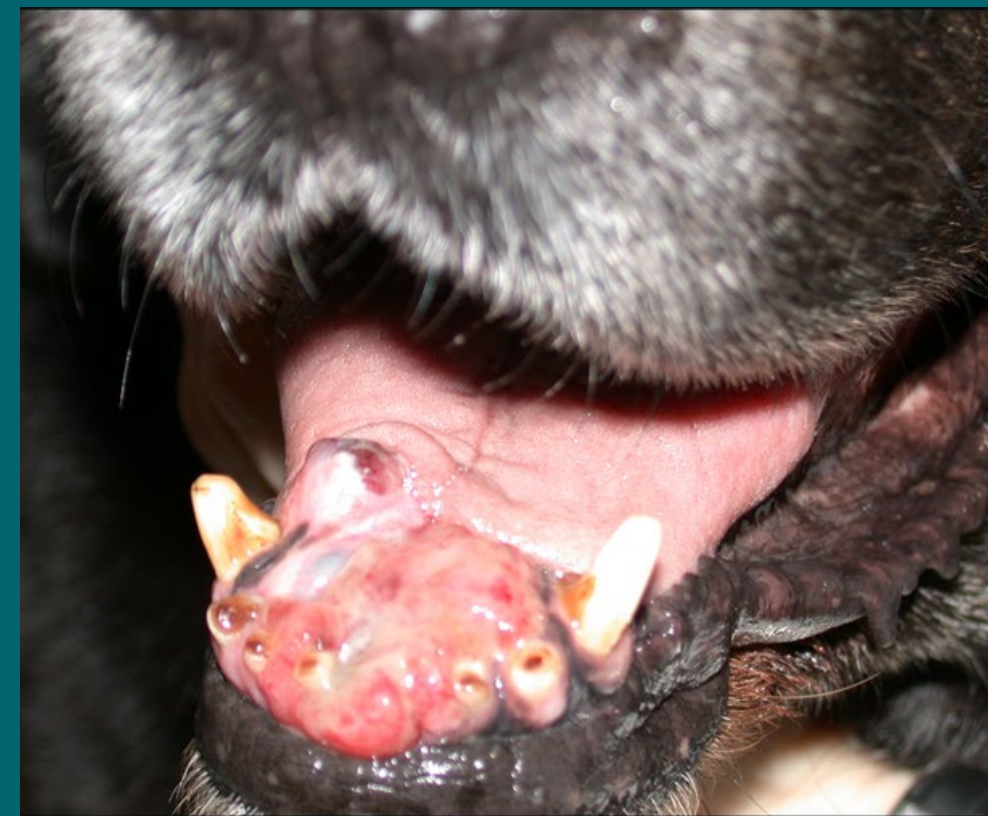
- Excellent with surgery or RT
  - < 5% recurrence rate

# MELANOMA



# K9 ORAL MELANOMA

- Most common K9 oral tumor
- Goldens, Cocker Spaniels, Chows, Poodles
- M > F
- Gingiva most common location
  - Buccal and labial mucosa
  - Hard palate
  - Tongue
- 2/3 pigmented, ulcerated
- Extensive local invasion
- Subset are well differentiated



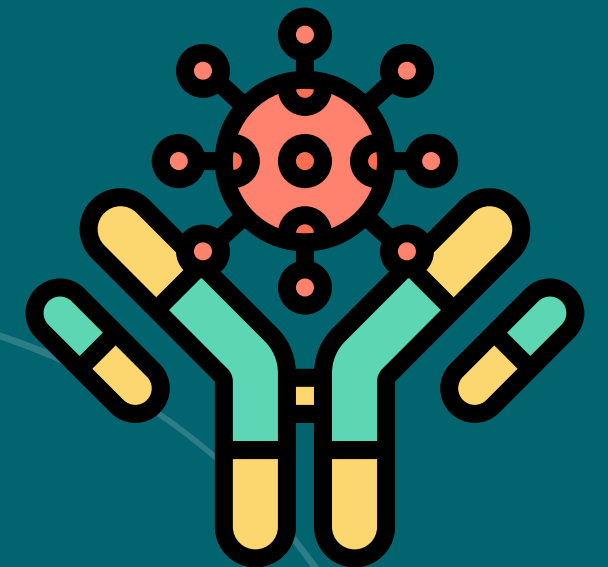
# OMM STAGING

**TABLE 1** The World Health Organization Staging Scheme for Canine Oral Malignant Melanoma<sup>14</sup>

	STAGE I	STAGE II	STAGE III	STAGE IV
Primary tumor size	T1 ( $\leq 2$ cm in diameter)	T2 (2–4 cm in diameter)	T2 <i>or</i> T3 ( $> 4$ cm in diameter)	Any T
Regional lymph nodes	N0 (no regional lymph node involvement)	N0	N1 (presence of regional lymph node metastasis) <i>or</i> N0	Any N, including N2 (fixed nodes)
Distant metastasis	M0 (no evidence of distant metastasis)	M0	M0	M1 (presence of distant metastasis)

# OMM SYSTEMIC TREATMENT OPTIONS

- Traditional chemotherapy less beneficial
  - Carboplatin
    - Response rate = 28% (partial)
    - Short duration of response
      - Median 165 days
- IntraleSIONal/ ECT may be exceptions
- Immunotherapy
  - Improves the immune system's ability to generate a response to cancer
  - Teach the immune system to recognize cancer antigens



# IMMUNOTHERAPY

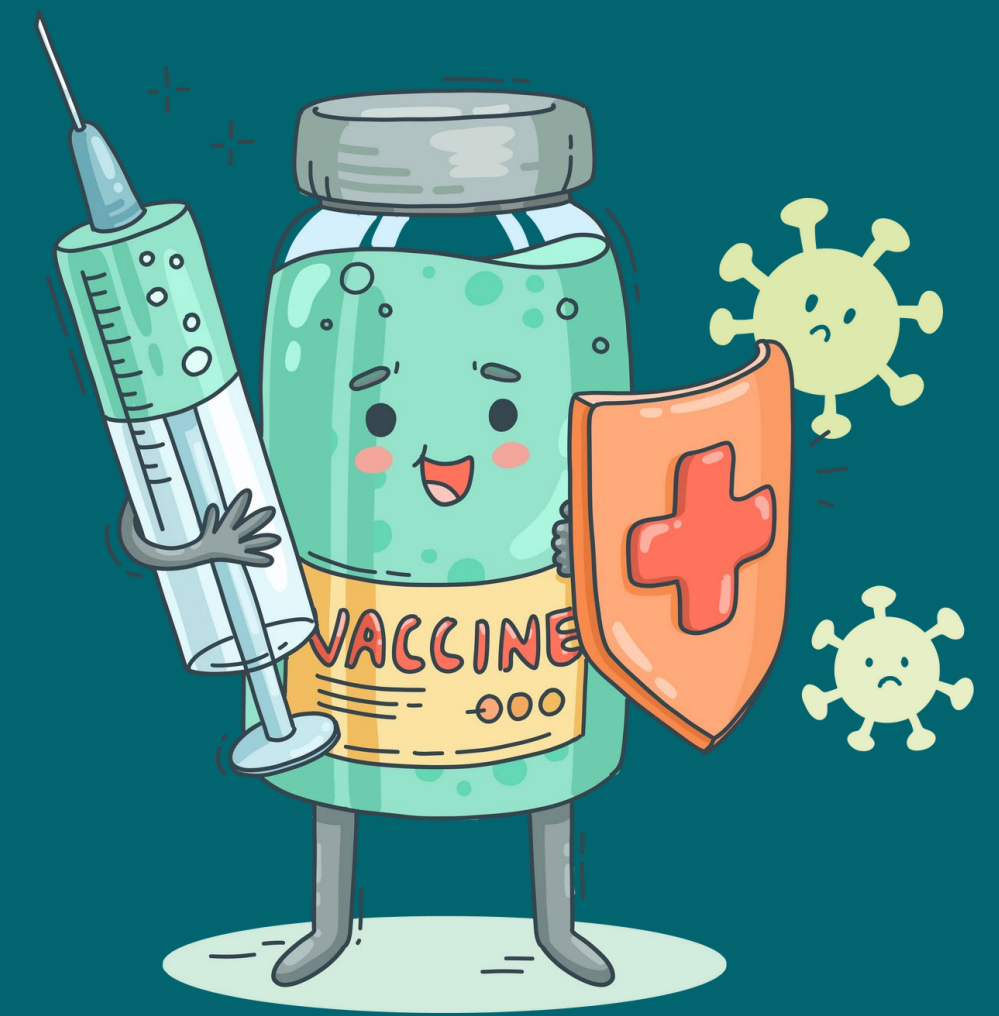


- Bacterial plasmid DNA vaccine
  - Encodes human tyrosinase antigen
  - Target for immune system
  - Helps to overcome self tolerance
- How its given
  - Transdermal
  - Uses VetJet
  - Medial thigh
- Schedule
  - Every 2 weeks x 4 doses
  - Booster every 6 months
  - Cost
    - Location dependent \$500 - 1000+ / vaccine



**NO SERIOUS SIDE EFFECTS!**

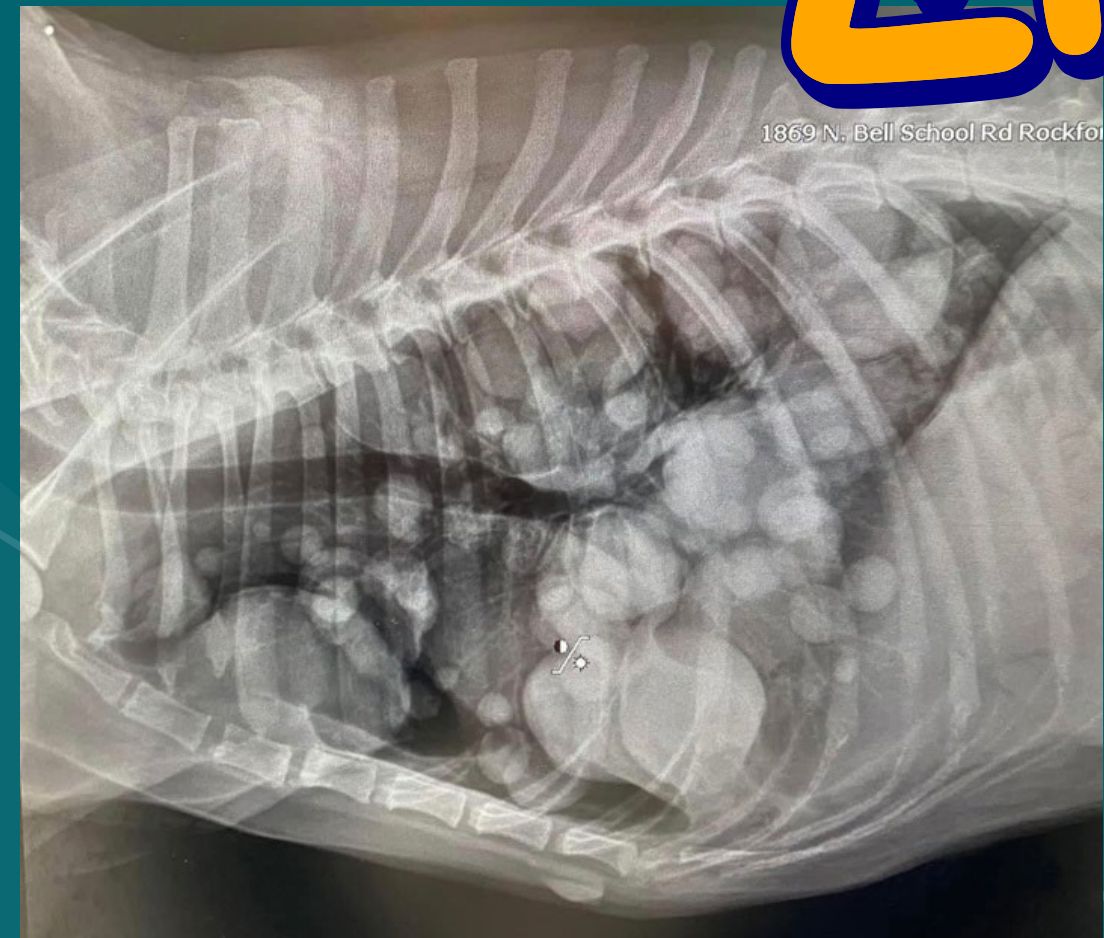
No big deal!



# ONCEPT CONSIDERATIONS

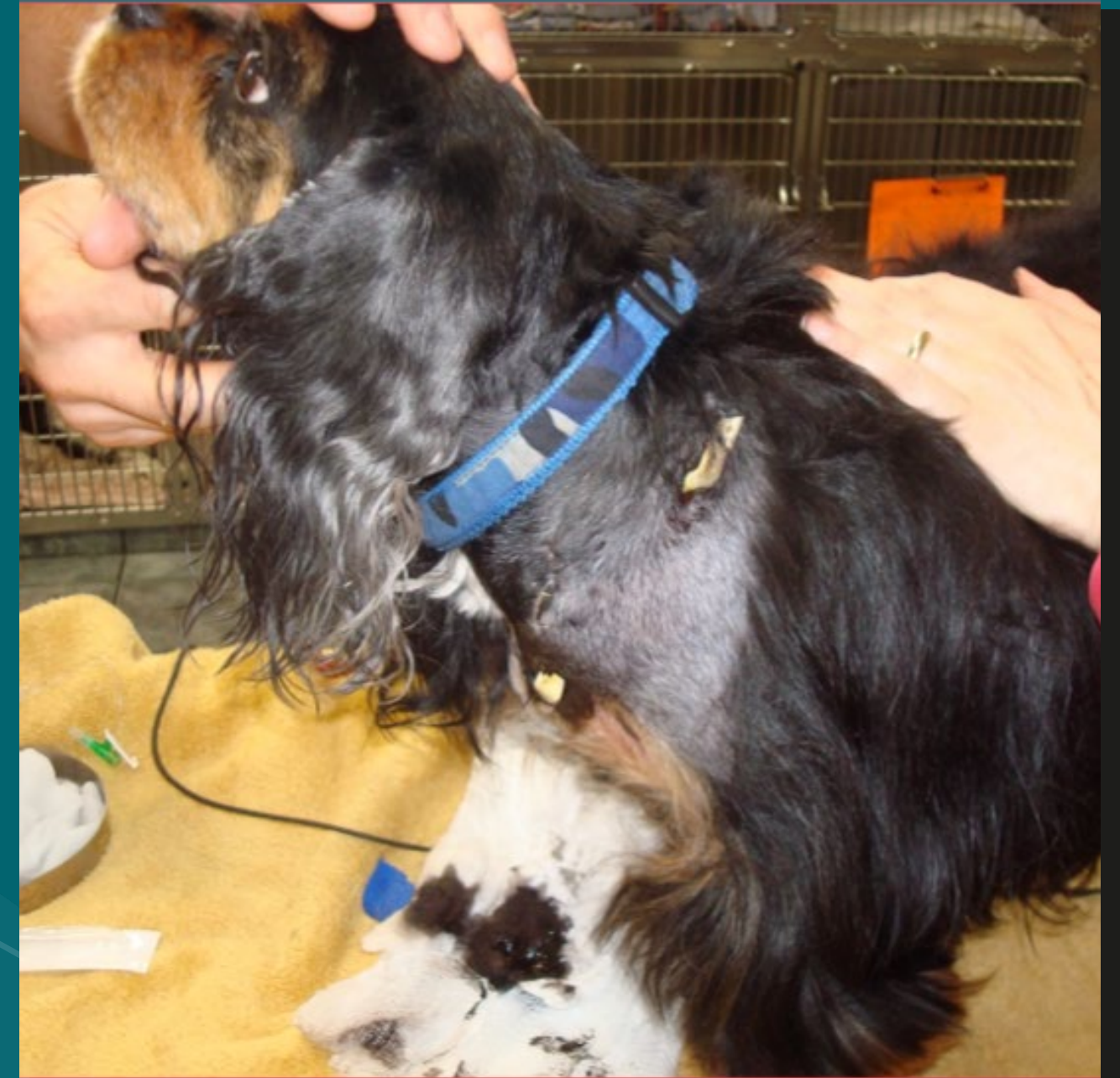
- Zero side effects
- Stage of disease
- How long does it take to work?
  - Lag time between vaccination & immune response
  - 3 months
  - Too late for some dogs

**Help  
BEFORE  
-IT'S TOO-  
LATE**



# NEGATIVE PROGNOSTIC INDICATORS

- Large size
  - $>2$  cm
- Stage
  - LN, lung mets
- Location
  - Caudal maxilla worse
- Nuclear atypia
- Mitotic index
- Degree of pigmentation
  - Less is worse
- Lymphatic invasion
- Ki67 index



# OMM PROGNOSIS

- Many factors involved
- Stage II and II OMM
- Surgery alone 5 -6 months
- 10% alive at 1 year with surgery alone
- Local tumor control + Oncept = 1 -2 years
- <50% of dogs die within 1 year
- 75% alive at 15 months
- Goal 1.5 years

## SURGERY ALONE

Stage I: 17-18 months

Stage II: 5-6 months

Stage III: 3 months

Stage IV: a few weeks to months

# WELL-DIFFERENTIATED ORAL MELANOMA

- Can be hard to decipher from biopsy report
- “Melanocytic neoplasms”
- **Mitotic index**
  - $<3/10$  hpf is better
- **Nuclear atypia**
  - $<30\%$  nuclear atypia is better
- **Degree of pigmentation**
  - Heavily pigmented is better ( $>50\%$  pigmented)
- **Ki67**
  - $<19.5$  is better

MELANOMA  
PROGNOSTIC  
PANEL

Mean survival almost 3 years


# FELINE OMM

- Uncommon
- Similar biologic behavior as in dogs
- Staging via lymph node cytology and chest xrays
- Local tumor control + Oncept vaccine
- Cats do not tolerate aggressive oral surgery well
- Cats may be less likely to respond to radiation therapy



# OMM RECAP

- Locally invasive, high metastatic potential
- Stage them!
  - Submandibular lymph node cytology
  - Chest xrays
- Clinical prognostic indicators
  - Large tumors
  - Caudal tumors (maxilla especially)
  - Mets
- Set the owner up for a plan
  - Local tumor control - surgery or RT
  - Oncept vaccine



Why do we  
have to get  
them too??

# SQUAMOUS CELL CARCINOMA

- Second most common oral tumor in dogs
- F = M
- Rostral mandible
- Bone invasion common
- Irregular, red, raised, ulcerated
- Secondary infections common
- Variable metastatic rate
- Rare
  - <10 %
- Exception: tongue, tonsils



# SQUAMOUS CELL CARCINOMA

## PAPILLARY SCC

- Distinct subtype of SCC
- Young dogs
- Also reported in older dogs
- Locally invasive but high cure rate



**Figure 1**

Photograph from case 1 that highlights the typical clinical presentation of canine oral papillary squamous cell carcinoma in this series of cases showing an exophytic neoplasm located in the rostral maxilla near the canine tooth.



Soukup, Jason W. et al. "Clinical, Histologic, and Computed Tomographic Features of Oral Papillary Squamous Cell Carcinoma in Dogs: 9 Cases (2008 -2011)." *Journal of Veterinary Dentistry* 30 (2013): 18 - 24.

# SCC - TX WITH SURGERY

- Surgery
  - Rostral tumors do better
    - Rostral to PM2
- Removal of bone
- Mandibulectomy MST 19-26 months
- Maxillectomy 10-19 months
- Overall - 15 years
  
- At least 2 cm margins



# SQUAMOUS CELL CARCINOMA

- Radiation therapy
- SCC is radiation responsive
- Microscopic disease = post operative , dirty margins
- Course fractionated MST >1 -5+ years (vs 6 months with sx alone)

- Gross disease

- Definitive RT – PFI 3 years
  - Best outcome if mass <4 cm
- Palliative RT
  - 77% response rate
  - MST 1 year
- Symptom improvement



# SCC MEDICAL THERAPY

## Piroxicam

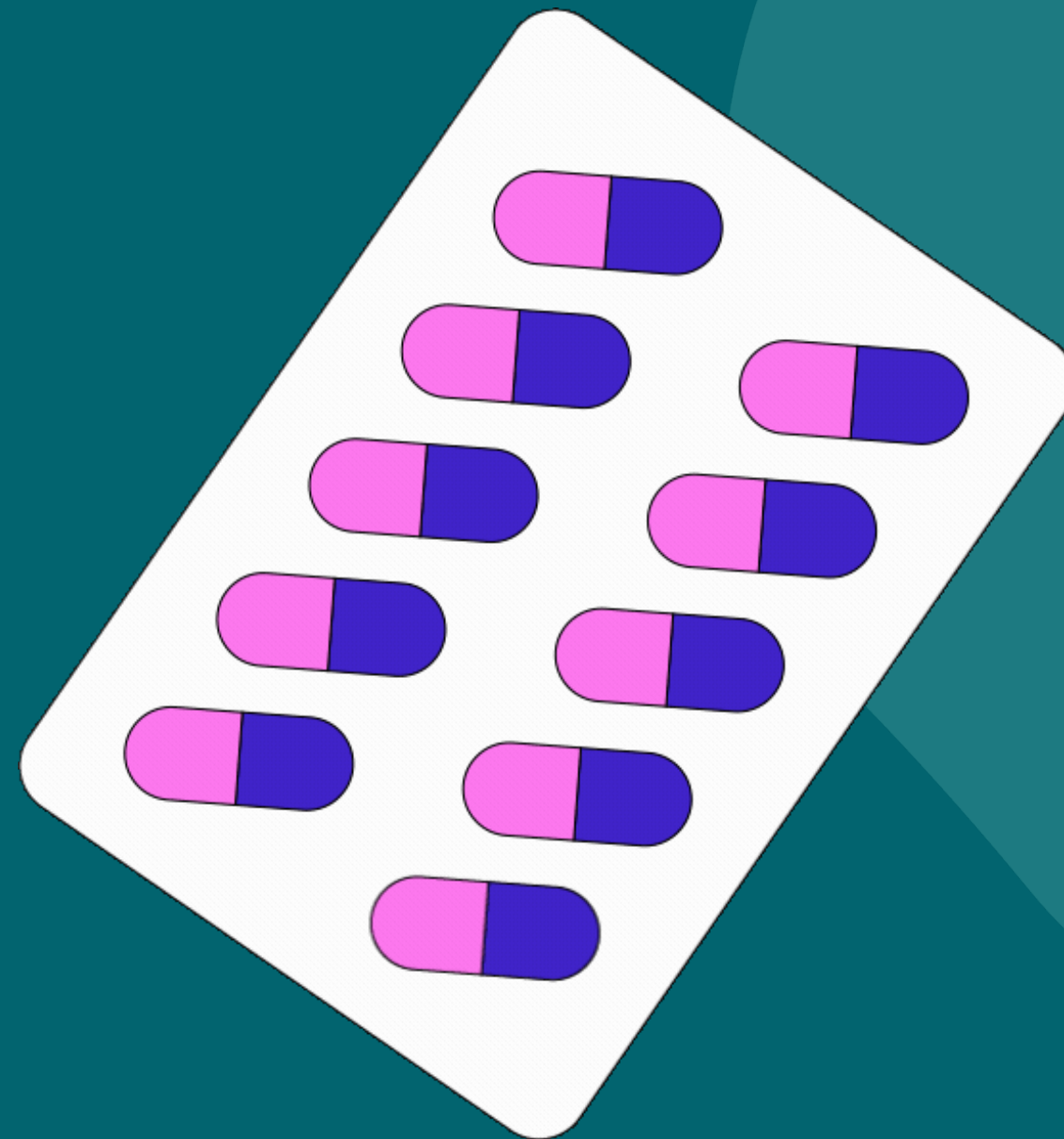
- 0.3 mg/kg with no wiggle room
- Get it compounded if you need to
- 18% response rate (CR + PR)
- 29% SD

## Cisplatin + Piroxicam

- 55% response rate (CR + PR)

## Carboplatin + piroxicam

- Non - tonsillar SCC
- 57% CR (4/7)
- DFI/MST not reached
- Median follow -up 534d

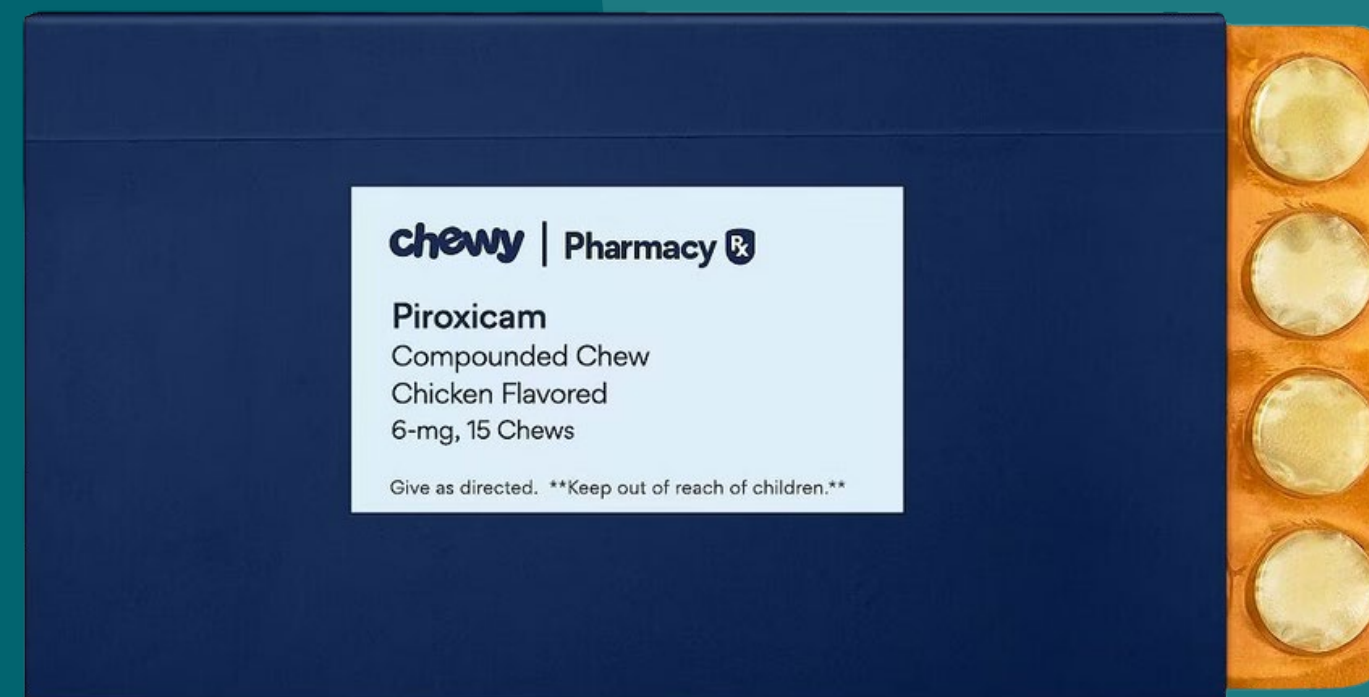


# SCC RECAP

- Prognostic factors
  - Age of patient (?)
  - Size of mass
  - Extent of surgery or RT
  - Recurrent disease
  - Location
    - Tongue and tonsil worst
- Overall: Good for complete resection
- 15% recurrence rate
- 18 month MST
- 70% alive at 1 year

REMOVE IT (if you can)

TX WITH PIROXICAM OR NSAIDS



# FELINE SCC

- Most common oral tumor
- Any site possible
- Risk factors
  - Flea collars
  - Canned food (fish)
  - Cigarette smoke
- Range of clinical appearances
  - Firm, lobulated, ulcerated, red
  - Thickening of chin
  - Usually extensive
- Metastasis uncommon



# FELINE SCC

- Surgery
- NSAIDs
- Chemotherapy
  - Pallia
  - 55% of cats have stable disease for up to 4 months
- Radiation therapy
  - Palliative protocol
  - May be combined with chemotherapy
  - 50% respond and can improve
  - BUT ... Benefit is short lived
    - <3-4 months



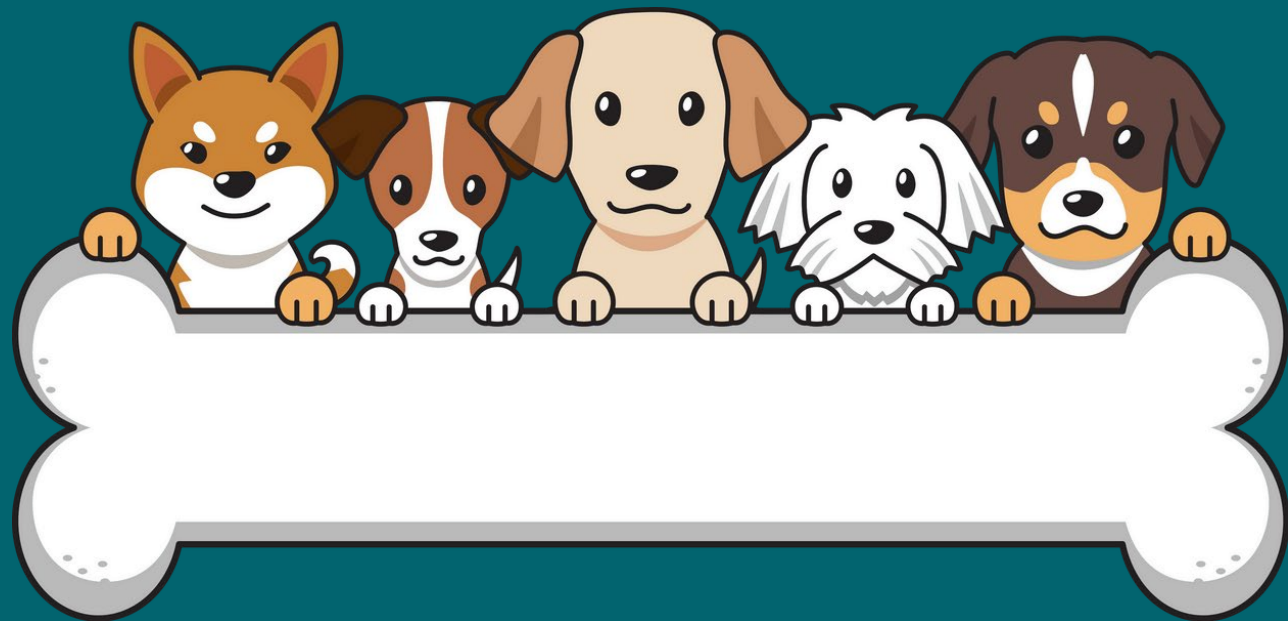
# FELINE SCC

- Prognosis is grave - <10% alive at 1 year?
- Palliative therapy is the mainstay of treatment
  - Pain management
    - NSAIDS
      - Meloxicam
    - Opioids
  - Magic Mouthwash
  - Acupuncture
  - Antibiotics for secondary infections
  - Nutritional support
    - Canned food only
    - Mirataz, Elura



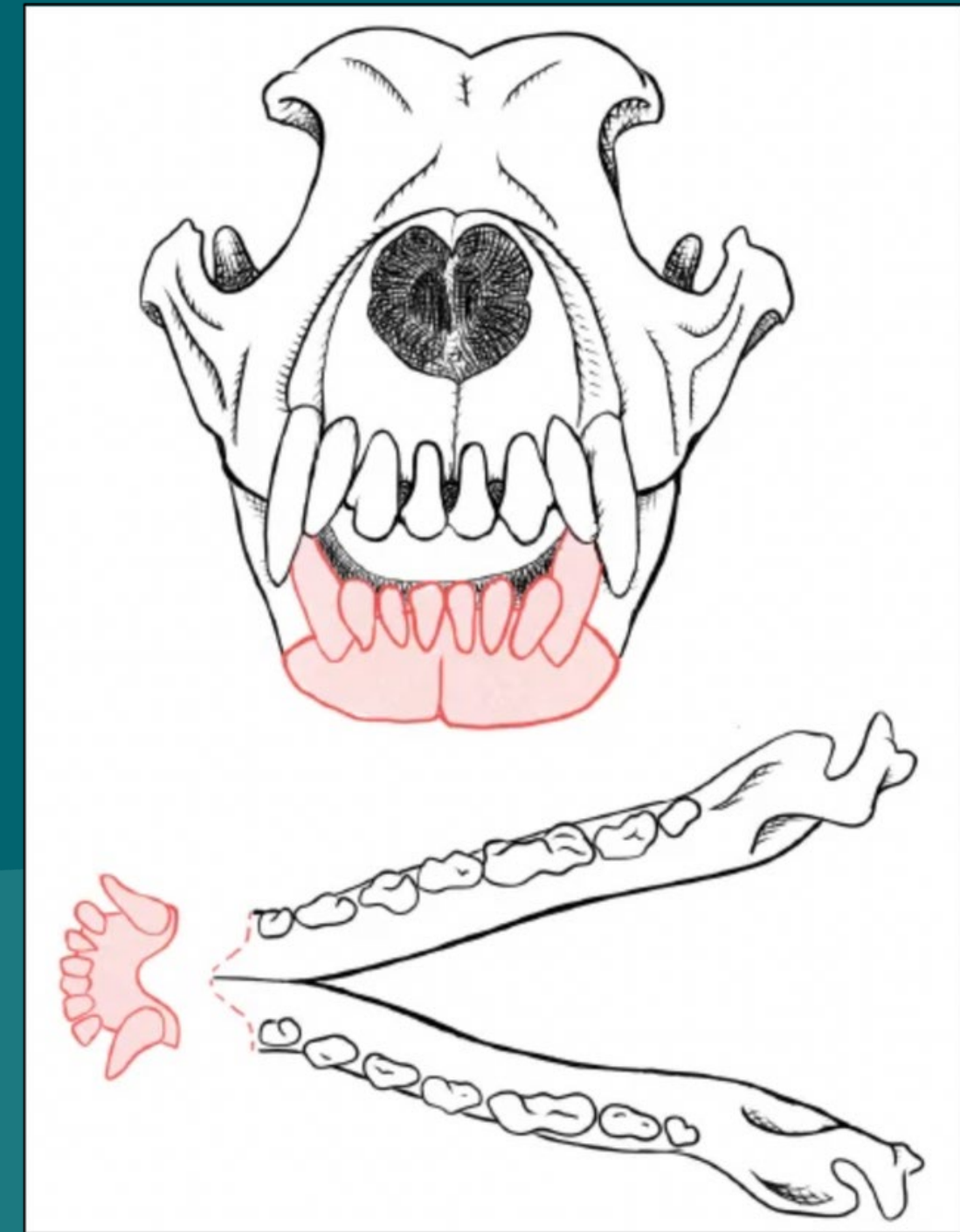
# OSTEOSARCOMA

- 4<sup>th</sup> most common oral tumor in dogs
- More common in large dogs
- Can be radiation induced
- Lower metastatic potential (?)
  - Up to 60% in some studies
  - Role of chemotherapy ?



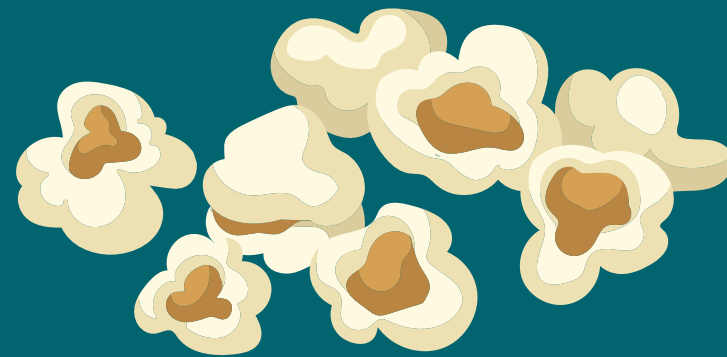
# OSTEOSARCOMA

- Treatment is surgery
  - 71% alive at 1 year
- Mandibulectomy
  - MST 14 - 18 months
  - Metastatic rate 28%
- Maxillectomy
  - MST 5 - 10 months
  - 33% recur
- Chemotherapy
  - Role of post op carboplatin poorly defined
  - Case specific



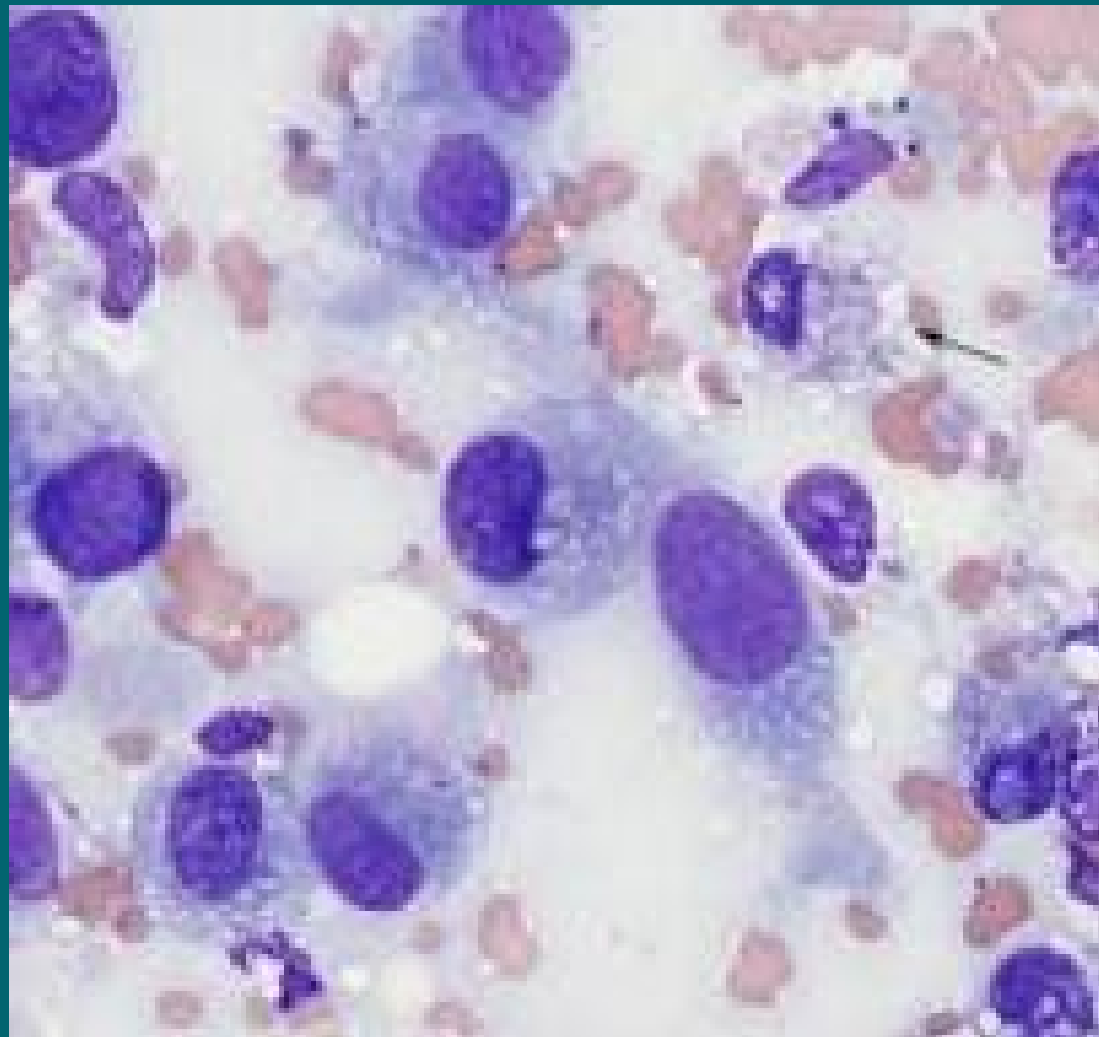
# MLO - MULTILOBULAR OSTEOCHONDROSARCOMA

- Tend to occur on the skull
  - Can affect the mandible and maxilla
- Fixed, firm mass
- Popcorn appearance on radiographs
  - Limited lysis
- TX of choice is surgery
- Can metastasize (lungs)
- Up to 60% recur locally
- Prognostic factors
  - Grade, extent of removal, location
    - Mandible is best



# FIBROSARCOMA

- M > F
- Palate
- Flat, ulcerated, firm
- Locally invasive, occasional distant metastasis



# FIBROSARCOMA

- Overall prognosis is poor
- Local control difficult
- 35% alive at 1 year
- Overall MST 11 months with      sx alone
- MST   sx + post -op radiation 1.5 years
  - Worse compared to STS on other parts of body

# HISTOLOGICALLY LOW - GRADE/BIOLOGICALLY HIGH-GRADE FSA

- Beware!
- Large breed dogs
  - Golden retrievers
- Grow very large
- Histopath = benign/low grade
  - Fibroma, nodular fasciitis, chronic inflammation
- Metastasis up to 20%



## CLINICAL DIAGNOSIS



# K9 LOW /HIGH FSA - TX

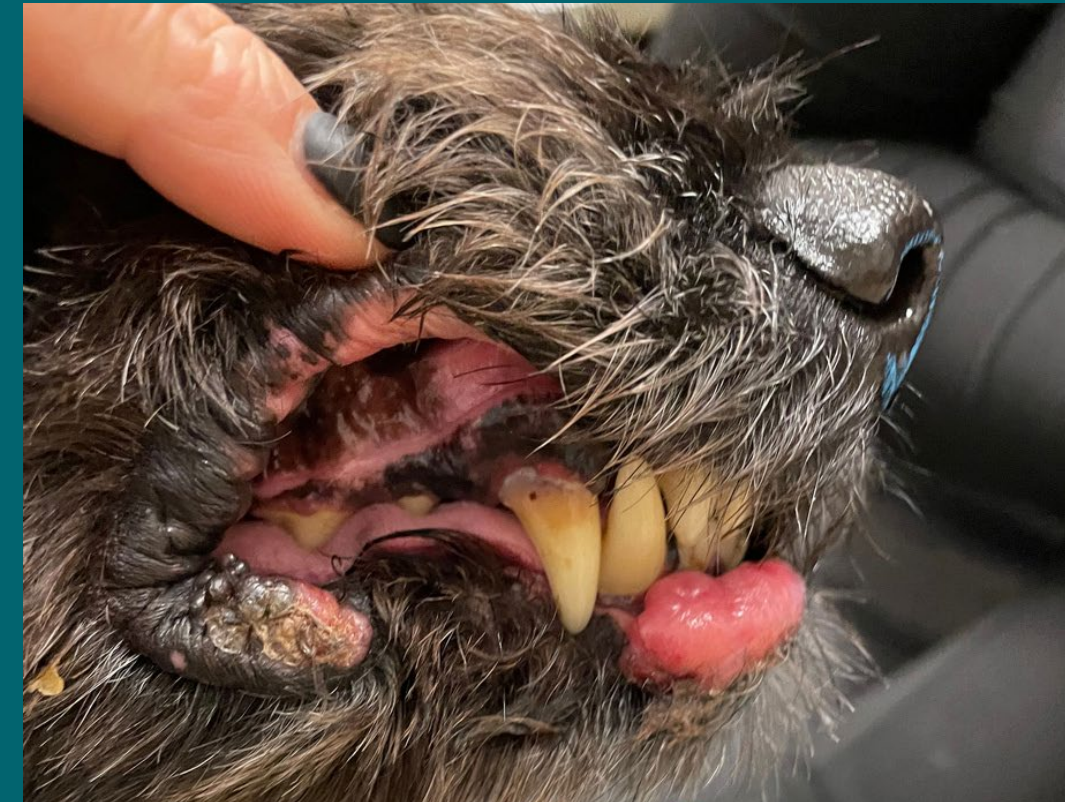
- En bloc surgical removal
- RT for microscopic disease
- Chemotherapy
  - NSAIDs, Doxorubicin?
- Prognosis is guarded
  - 9 months
  - Poor local control
  - Rapid clinical course
- Local recurrence common



Typical high-grade low-grade fibrosarcoma on the rostralateral maxilla in a Retriever (breed predisposition)

# ORAL LYMPHOMA

- Epitheliotropic lymphoma
- T cell phenotype
- Can be an extension of cutaneous lymphoma
- Clinical appearance very typical
  - Depigmentation
  - Ulceration
  - Fire engine red gums



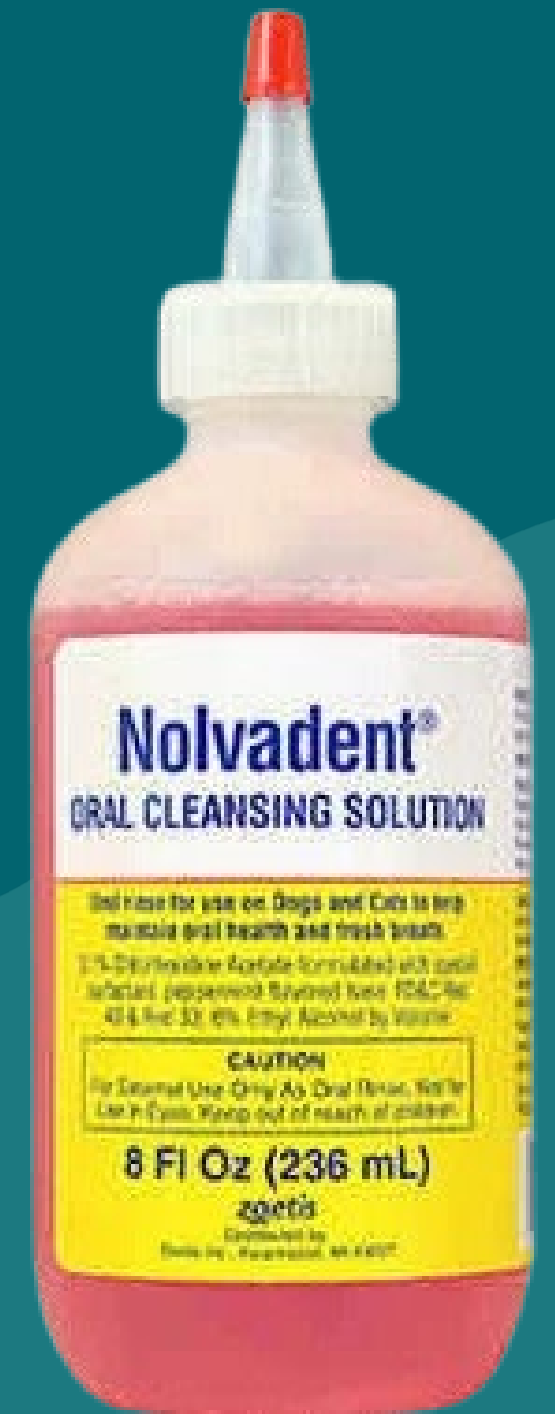
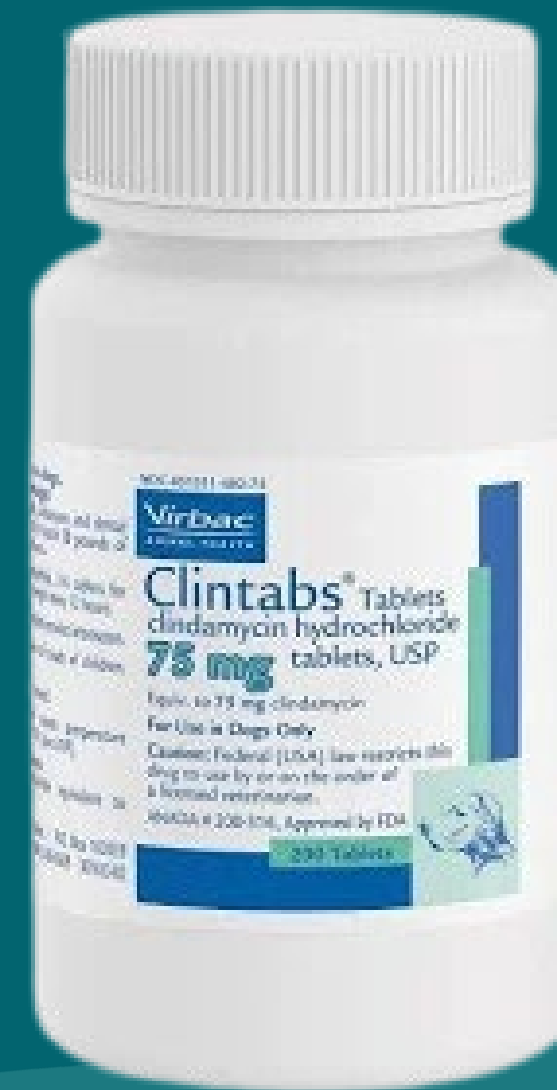
# ORAL LYMPHOMA

- Diagnosis
  - Cytology or biopsy
- Treatment
  - Surgery is solitary lesion
  - Medical
    - Prednisone
    - Lomustine + prednisone
      - 60-80 mg/2 every 3 weeks x 5
      - ~50% response rate
      - Survival 6 months
    - Radiation therapy
      - Up to 70% respond
      - Survival of 2 years



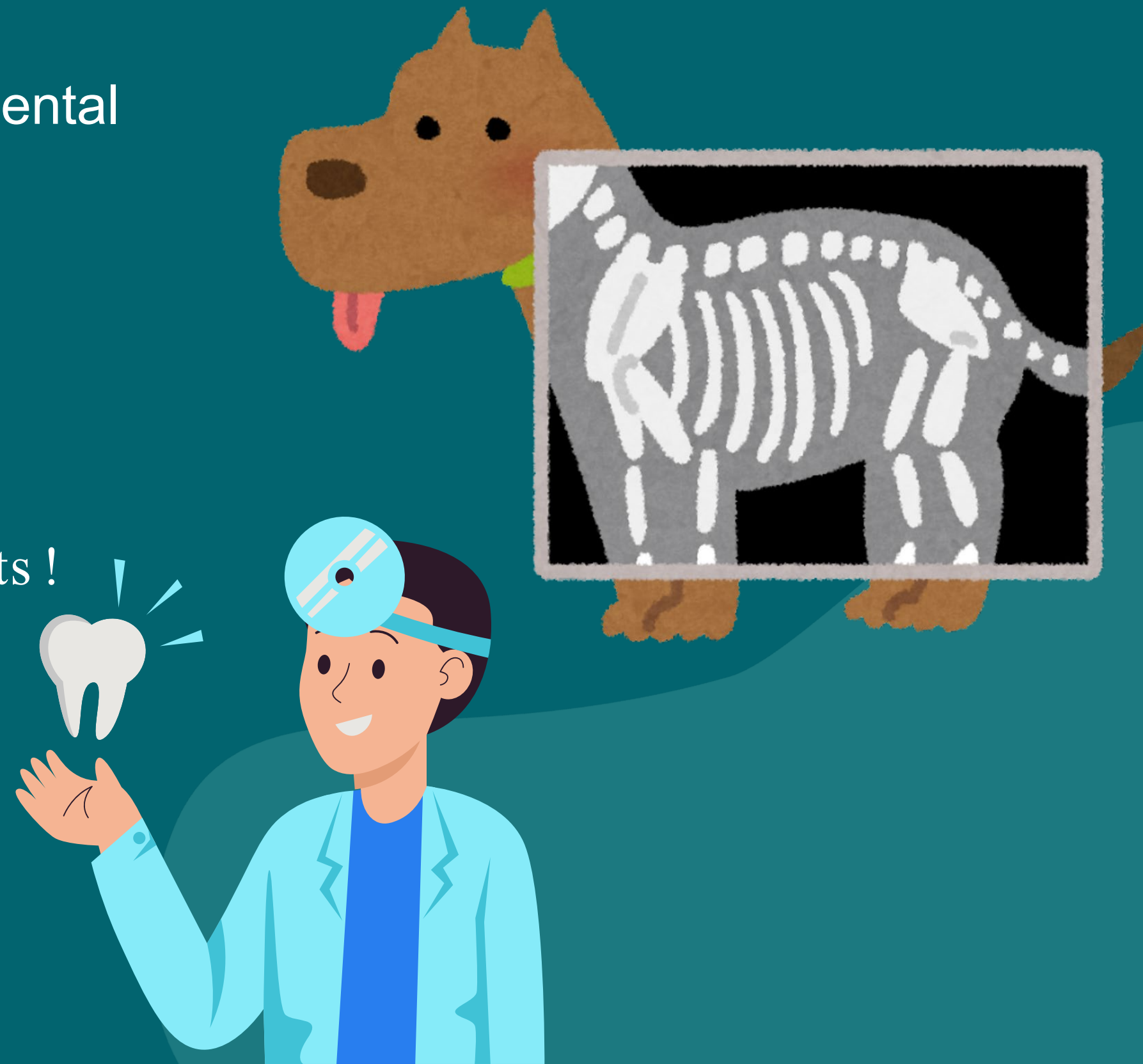
# WHAT CAN YOU DO THAT'S EASY?

- Tell owners to feed canned or soft food
- Treat for pain
  - NSAIDs, gabapentin/pregabalin, Tylenol IV
- Topical therapy
  - Magic mouthwash
    - Equal parts Benadryl/Maalox/viscous lidocaine
  - Chlorhexidine spray/rinse
  - Decaffeinated black tea
    - Tanins are astringent
- Pulse dose antibiotics
- Set up expectations
  - Teeth will fall out, it will smell and bleed, the pet may stop eating
- Euthanasia talk



# ORAL TUMOR RECAP

- Biopsy anything odd you see during a dental
  - Wedge, large piece
- Stage them
  - CXR
  - LN cytology
- All are locally invasive
- Melanoma is the one that usually mets!
- Aggressive surgery is best
- Talk to a dentist
- Long term survival uncommon





QUESTIONS???