ESAVS
European School for
Advanced Veterinary Studies

UNIVERSITY OF LUXEMBOURG

Case Report Instructions
EMSAVM / MAS Dentistry

General instructions

- Case reports, written in prose, must be in a problem-oriented approach and include a complete presentation of the case, illustrations where necessary, literature review on the subject with references and a discussion. Candidates must demonstrate a comprehensive understanding of the topic.
- A case report should contain 2000 words +/- 10%, excluding tables, references and appendix.
- The 10 cases must be a mixture of various species, problems and diagnosis, all pertaining to the selected master's program. Candidates are required to keep a table of the already submitted cases which shall be send with each new case report submission. The ESAVS Office will provide an Excel template for the table below:

Case Nr.	Species	Problem/s	Diagnosis

- Candidates are advised to submit cases shortly after beginning and throughout the program and not all cases at the end of the program.
- ESAVS cannot guarantee the evaluation of more than 3 case reports per semester. To ensure an evaluation in a specific semester, reports should be submitted no later than the given deadline for the respective semester (please see Important Dates on the ESAVS website).

Cases should be set out under the following headings:

- Title
- Signalement
- Case History
- Physical Examination
- Differential diagnosis and final diagnosis
- Medical and surgical treatments
- Post-operative care
- Results and control
- Discussion of case in relation to current literature (no repetition of literature but a discussion why the case fits or does not fit what is known)
- References
- Pictures, including captions (if necessary)

Each case report is viewed by one member of the Examination Board and graded on a 0-20 scale (<10= fail, 10-11,9 = sufficient, 12-13,9 = fair, 14-15,9 = good, 16-17,9 = very good, 18-20 = excellent).

10 points are minimally required as a passing grade. Up to 2 reports may be revised and re-submitted.

The grades of the individual case reports are averaged to obtain one single grade. When this average grade is below 10, candidates are requested to resubmit new cases for the failed case reports.

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Evaluation of a case report

Step 1: Is the case report acceptable?

Is the case described in the report suitable at all? Reasons to reject a case are:

- A case is too simple (e.g. professional dental cleaning in a dog or cat)
- Lack of an adequate number of state of the art clinical tests to arrive at a diagnosis (or at least a presumptive diagnosis). The case could be resubmitted when the lacking information can be retrieved.
- Inadequate surgical technique
- The animal's life was endangered by excessive/unnecessary diagnostic tests or treatments (including surgery). Such a case cannot be resubmitted.
- A case that falls not within the specified master program
- Most diagnostic tests and interpretation are done by a referring veterinarian
- Inadequate follow-up of a case (e.g. diagnosis reached after euthanasia with no follow-up available)
- Multiple cases all with the same problems or diagnosis
- After submission of certain number of the case reports the candidate should pay attention at adequate representation in terms of problems, species and categories.
- Cases not seen during the enrollment in the program of the master student or where the master student is not the primary responsible clinician
- A case in which there is plagiarism or simple repetition of other submitted case reports
- When techniques applied in patient treatment are controversial or not accepted in standard veterinary dentistry.

If a case is rejected the case report is assigned 0 points. The reason will be stated in the evaluation.

Step 2: Grading of the accepted case report

The case report will be evaluated based on a check sheet

An accepted case starts with the maximum of 20 points. 10 points are minimally required as a passing grade.

The check sheet (see below) contains a list of 12 potential inadequacies. For each one the examiner can deduct a number of points. The examiner is not limited to the potential maximum number of points to be deducted, this is just a guideline (i.e. it is possible to deduct more points in a single category if applicable). At the end a total of points remains.

Recommendations for the candidate to avoid deduction of points:

- Make sure the history is sufficient both: general and dental/maxillofacial.
- Give all details of the physical exam, apply the standard methods used for veterinary dentistry (dental chart, intraoral radiography etc)
- Reported tests need to be relevant for the animal: XRays, CT
- Explain how you came to the diagnosis
- Be precise in the description of the treatment, use the medical terms/professional language suggested during courses, avoid common language (e.g. "the tooth was extracted" instead of „ the tooth was pulled out" or "the patient did not express any discomfort" instead of "the patient was happy")
- Discuss the case – do not just repeat text book knowledge! Bring relevant literature to justify your treatment
- Be sure your treatment was appropriate and discuss the alternative options
- Be precise about results and complications
- Follow standards backed up by evidence based medicine

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Evaluation Check Sheet of a Case Report / Dentistry

Inadequacies	**Potential max. deduction**	**Points deducted**
Incomplete signalment, history and physical examination *Comments:*	1	
Inadequate or incomplete oral and maxillofacial examination *Comments:*	1	
Inadequate choice of tests and assessment *Comments:*	1	
Poor quality representation of diagnostic tests (e.g. radiographs, photographs) *Comments:*	2	
Incorrect or unjustified diagnosis *Comments:*	2	
Inadequate or inappropriate medical management *Comments:*	2	
Inadequate oral/dental treatment *Comments:*	4	
Inadequate anaesthetic management *Comments:*	2	
Inadequate follow-up for the case report to be meaningful *Comments:*	1	
Inappropriate discussion, not adequately referenced *Comments:*	2	
Language and word count inadequate *Comments:*	1	
Other problems not covered above *Comments:*	1	
GRADE (= 20 – total deducted points)		

Since there is no “perfect” case, the following example for a case report should be viewed more as how to present your case.

For another example, please see this article in the JVD:
Ignacio Velazquez-Urgel, Melissa D. Sanchez, Mary E. Buelow, Lenin A. Villamizar-Martinez and Alexander M. Reiter, Dipl. Tzt. : Maxillary and Mandibular Peripheral Odontogenic Fibromas (Fibromatous Epulides of Periodontal Ligament Origin) in a Cat; Journal of Veterinary Dentistry 2018, Vol. 35(4) 251-257, DOI: 10.1177/0898756418812100

You may also access the article via the ESAVS eLibrary:
https://mediacenter.schweitzer-online.de/esavs

In order to subscribe to the eLibrary, please contact: registration@esavs.eu

Case report 4

Candidate name:

Program:

Case report Number:

Date of submission:

Word Count: 1863

Dentigerous cyst

Signalement: Dog "Tilde, tibetan spaniel, female, born on 11/04/2016 (2 years of age), color is red, BCS 5/9

Case history: The dog was presented for yearly health control and vaccination. It was the second time she was presented at the clinic; both times was yearly health control. She had never been treated for any pathologic conditions. She was diagnosed with patellar luxation grade 1 on both legs, that had not been treated. She had never had any dental procedures. 5 teeth were missing (205,305,405,311,411) and there was a fluctuating swelling (fig.1) at the edentulous area where 305 was missing. Therefore, an appointment for further examination and treatment was made one week later.

Physical examination conscious: The dog was bright, alert and responsive but a little nervous. T. 38.6. Pulse rate 120. Breathing was not counted as she was panting probably due to the surrounding temperature. The heart sounded normal with two well defined and separate heart sounds with no murmur. The mucous membranes were pale, moist and red. CRT< 2 sec. The weight was 6,3 kg. A preanesthetic blood sample was performed (Table 1). It showed elevated red blood cells due to an increased sympathetic nervous tone when the dog was at the clinic, and little elevation in ALAT (2 times normal reference value). ALAT is a sign of liver cell damage. As the dog showed no other signs of liver disease, I assessed that the moderate elevation should just be monitored.

The dog was brachycephalic, and the face was symmetric with normal occlusion. The teeth 308/309 and 408/409 were crowded. The dog showed no sign of discomfort from the oral cavity such as chewing problems, problems with retrieving or drooling. There was no evident draining tract from any teeth and no swelling except in the left lower jaw where 305 was missing. When palpating the edentulous area, the dog showed no signs of pain. The mucosa overlying the swelling had a similar colour as the rest of the oral mucosa.

Physical examination under general anesthesia: The dog was fasted 12 hours prior to anaesthesia. The dog was anaesthetised with premedication [a]butorphanol inj. 1 mg,

[b]medetomidine inj. 0,03 mg and [c]meloxicam inj. 1,3 mg. Induction through an intravenous catheter placed in the right cephalic vein with [d]propofol inj. 30 mg. An endothracheal tube was placed in trachea. The patient was connected to a half-closed anaesthetic delivery system which delivered a mixture of 100 % oxygen and [e]isoflurane. During the anaesthetic procedure the dog was given [f]Ringer solution iv 5 ml/kg/hour and she was monitored with a monitor including capnography, blood pressure, ECG and pulse oximetry. The dog was placed in lateral recumbency. The oral cavity was flushed with [g]chlorhexidine solution 0,12 % and the teeth were scaled with ultrasonic scaler and polished with pumice. Full mouth dental radiography was performed (figures 2-14), and all the teeth were examined using a periodontal probe to measure the depth of the gingival sulcus and periodontal pockets around each tooth. All the findings were recorded in the patient's dental chart (table 3).

A 4 mm pocket was found on the buccal side of the 204.

Of the "missing" 5 teeth the four of them were truly missing and the fifth, 305 was embedded in the jaw. The unerupted 305 was enclosed by a radiolucent halo of approximately 5 mm attached to the cemento-enamel junction of the tooth. Only the very apical part of the root was attached to the jaw bone. There was no visible bone covering the crown. The 306 was rotated with the mesial root in a disto-lingual direction. Most of the mesial root was without attachment to the bone. There were no signs of tooth resorption on 304, 305 or 306.

Case assessment: The radiolucency and the swelling in the lower left jaw in association with the first premolar embedded in the jaw was assessed to have the preliminary diagnose of a dentigerous cyst, but other differentials could only be excluded on histopathologic examination:

1) Dentigerous cyst. In this case findings on radiograph is nearly pathognomonic for a dentigerous cyst, but other lesions may appear similar on radiographs.
2) Periapical or radicular cyst. The lesions are strictly inflammatory associated with a pre-existing periapical granuloma of a non-vital tooth. None of the involved teeth in the lesion seemed to be non-vital and the dog showed no pain on palpation.
3) Odontogenic keratocyst-like lesion. These cysts have aggressive and destructive behavior and originate from dental lamina remnants in the maxilla or mandible.
4) Odontogenic or non-odontogenic tumor.

The diagnose was based on radiography and histopathology.

In this case it was necessary to perform the treatment based on the preliminary diagnose of dentigerous cyst and afterwards send the cyst's lining to a lab for the conclusive diagnose.

The periodontal disease for the upper left canine (stage 2) in this case was plaque induced as there were no other findings that could explain the pathology.

Treatment plan: The treatment plan was to extract the affected teeth 305 and 306 with a complete enucleation of the cyst wall and curettage. The cyst lining should be submitted for histopathologic evaluation for a definitive diagnose.

The treatment plan for the 204 was subgingival debridement and flushing with chlorhexidine 0,12% solution.

Treatment: Local nerve block was performed on the left inferior alveolar mandibular nerve with 0,5 ml of [h]bupivacaine 0,25%. A mucoperiosteal flap was created by making an incision from the disto-labial line angle of the second premolar to the mesial border of the cyst using a size 15 scalpel. 2 vertical releasing incisions were made to make a pedicle flap. A periosteal elevator was used to raise the pedicle flap with care to preserve the middle mental nerve. As the flap was elevated the cyst and the first and second premolar was exposed (fig. 15). The second premolar was sectioned with a cross cut fissure bur. The first and second premolars were carefully extracted using a 2 mm elevator to disrupt the alveolar attachments to achieve movements of the teeth. Then the teeth could easily be extracted with extraction forceps.

Using the periosteal elevator and a spoon curette the cyst lining was carefully removed and placed in a formalin solution for evaluation of at pathologist at the [1]Idexx laboratory in Germany. Thorough curettage was performed with the spoon curette to prevent recurrence of the cyst. The wound was flushed with saline solution and the mucoperiosteal flap was made moveable by incising the periosteal attachment along the ventral margin of the flap using a la Grange scissor. Before closure of the wound the alveolar bone was smoothened with a tapered diamond burr (figure 16). The flap was closed using a 4-0 monofilament suture made of poliglecaprone 25 in a simple interrupted suture with the suture line over the healthy mandibular bone on the lingual aspect (figure 17).

A blood clot should be sufficient to act as a scaffold for bone growth since there was sufficient healthy alveolar bone remaining after extraction and enucleation of the cyst.

Following the oral surgery intra-oral radiograph was taken to ensure that the extractions were complete (fig 18).

Postoperatively the patient was given [i]buprenorphine 0,1 mg just after the surgery and for every 24 hours the medication with [j]meloxicam 0,7 mg oral solution should continue for 1 week. The owner was instructed not to let dog chew in any toys or chewing bones and the diet should be soft for 10 days to prevent dehiscence, infection and pain from the surgical site.

Diagnosis: The preliminary diagnose of a dentigerous cyst was confirmed by the histopathology. The histopathologic findings were stratified squamous epithelium lining a cyst that was compatible with a dentigerous cyst. No inflammation as well as no neoplastic transformation was present (table 2).

Follow up: 10 days after surgery the follow up revealed that the surgical wound was healing well with no sign of dehiscence. The dog was eating well and at home the dog was alert and energetic.

A plan was made for radiographic evaluation 2½ months, 1 year and 2 years after surgery. This case had not reached the 1 year after surgery yet, so only the 2½ months evaluation has been made. This revealed healthy bone formation, though not complete, in the cystic cavity with no sign of cystic reformation (fig 19-20).

Discussion

Odontogenic cysts are epithelial lined structures that appear in the tooth-bearing areas of both the upper and lower jaw. In dogs the cysts are considered rather uncommon. (Chamberlain et al, 2012) Histopathology is the main modality for differentiating between the different types although it is important to understand the clinical behavior and the radiological presentations. (Niemiec, 2010) Dentigerous cysts, periapical cysts and odontogenic keraticyst-like lesion are the 3 different types that are reported. Odontogenic cysts arise from cells from the rest of Hertwig's root sheath (epithelial rests of Malassez) that are incorporated in the developing periodontal ligaments. (Babbit, Krakowski, 2016) In this case the odontogenic cyst was a dentigerous cyst, t is the most prevalent cyst in dogs. Dentigerous cysts are associated with unerupted normal or malformed teeth and arise from remnants of the enamel organ. The pathogenesis is uncertain, but the expansion of the cysts occurs by passive osmotic fluid accumulation, proliferation of epithelial cells and release of mediators for osteoclastic bone resorption. It is a development problem due to lack of eruptive forces or due to a physical barrier Brachycephalic breeds have a higher incidence than other breeds, the exact mechanism for this is still unclear, though dental crowding in these breeds could be the source for impacted teeth. (D'Astous, 2011) The mandibular first premolars are the most prevalent teeth for dentigerous cyst formation, but maxillary and mandibular canines are also associated with cysts formation. The age of diagnosis is between 6 months and 10 years with the highest frequency between 2 and 3 years. (Thatcher, 2017)

Clinically the patients are generally asymptomatic unless the cysts become infected or pathologic fractures occurs due to the bone osteolysis. Sometimes, but not in this case, a blue appearance can be seen in the mucosa overlying the cyst. Radiographic appearance of the dentigerous cysts is nearly pathognomic for the diagnose. The cyst appears with a radiolucent halo surrounding the crown of the unerupted tooth with a well circumscribed margin of thin cortical bone present. (Babbit, Krakowski, 2016) Neoplastic transformation can appear for dentigerous cysts; however, this is very uncommon. Hence histopathologic evaluation is necessary to rule out any neoplastic transformation.

Prognosis for these lesions is excellent if diagnosis and treatment are achieved relatively early in the disease course.

The treatment of dentigerous cysts are creation of a mucoperiosteal flap, extraction of the unerupted tooth and complete enucleation of the entire cystic lining. It is important to avoid leaving any of the cyst lining behind, as this could allow the cyst to reform. If the cyst has grown quite large, marsupialization can be performed as the initial step in therapy. This will allow to decompress the cyst and result in a reduction of the bony defect. Complete removal can then be performed as second step of treatment via a less invasive surgery later.

It is recommended to make radiographic follow-ups for a minimum of 2 years until there is radiographic evidence of complete re-ossification of the cyst. (Thatcher, 2017)

[1]Idexx laboratories. Ludwigsburg, Germany

[a]Dolorex inj. 10 mg/ml. Intervet international, Holland

[b]Sedastart

[c]Metacam inj. 5 mg/ml. Boehringer Ingelheim Animal Health. Germany

[d]Propovet multidose 10 mg/ml. Zoetis, Finland.

[e]Isoflo vet 100%. Zoetis, Finland

[f]Ringer-lactat "Fresenius Kabi". Fresenius Kabi. Denmark

[g] Chlorhexidine 0,12 %. Apoteket, Denmark

[h]Marcain inj. 2,5 mg/ml. Aspen Nordic. Denmark.

[i]Buprenordale inj. 0,3 mg/ml. Dechra veterinary products. Denmark.

[j]Metacam oral solution 1,5 mg/ml. Boehringer Ingelheim Animal Health. Germany

References

Chamberlain TP, Verstraete FJM. Clinical behavior and management of odontogenic cysts. In: Verstraete Frank J M, Lommer Milinda J. Oral and maxillofacial surgery in dogs and cats. Saunders Elsevier 2012: 481-86.

Niemiec BA. Small animal dental, oral & maxillofacial disease. Manson publishing. 2010: 118-119.

Babbit SG, Krakowski VM. Incidence of radiographic cystic lesions associated with unerupted teeth in dogs. Journal of veterinary dentistry. 2016; 33: 266-233.

D' Astous J. An overview of dentigerous cysts in dogs and cats. The Canadian veterinary journal. 2011; 52: 905-907

Thatcher G. Oral surgery: Treatment of a dentigerous cyst in a dog. The Canadian veterinary journal. 2017; 2:195-199A

Appendix

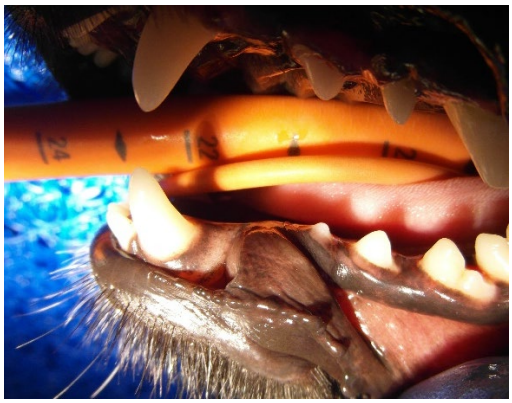


Figure 1. Swelling of the left mandible

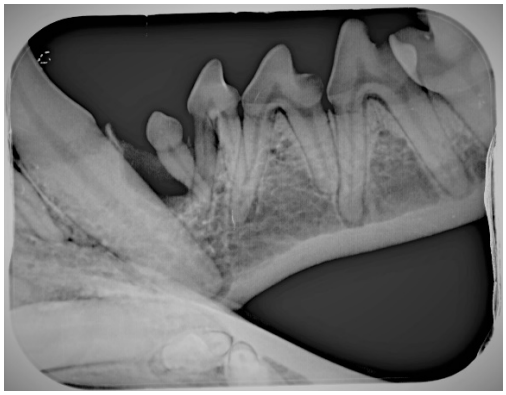


Figure 2

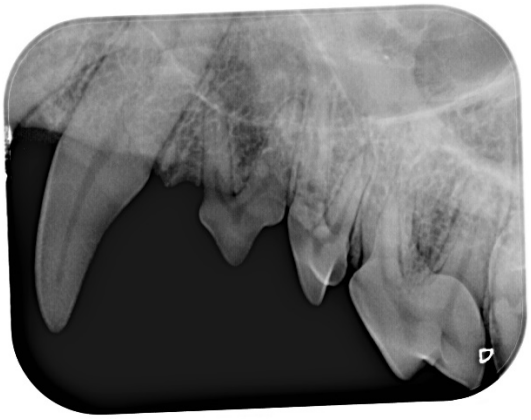


Figure 3

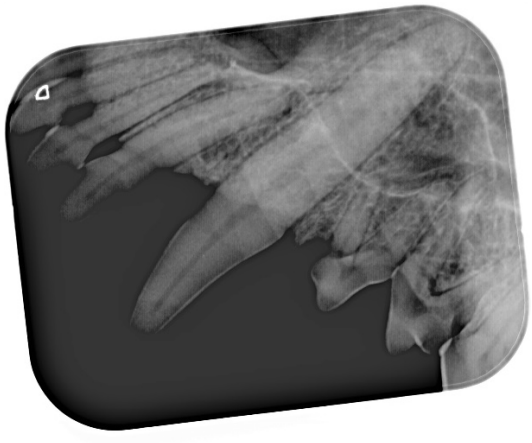


Figure 4

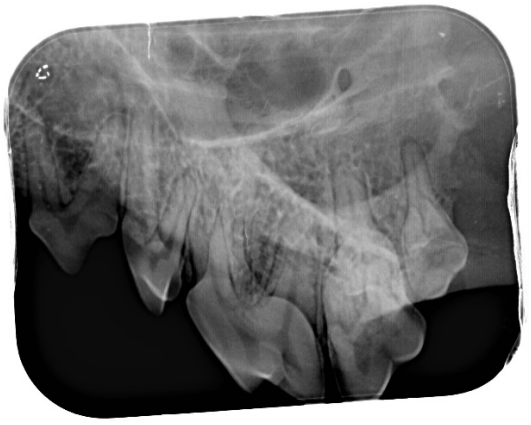


Figure 5

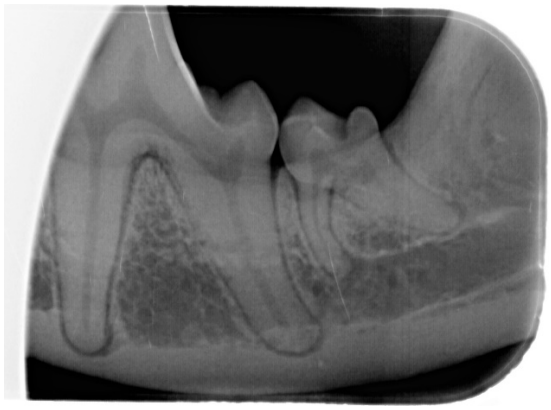


Figure 6

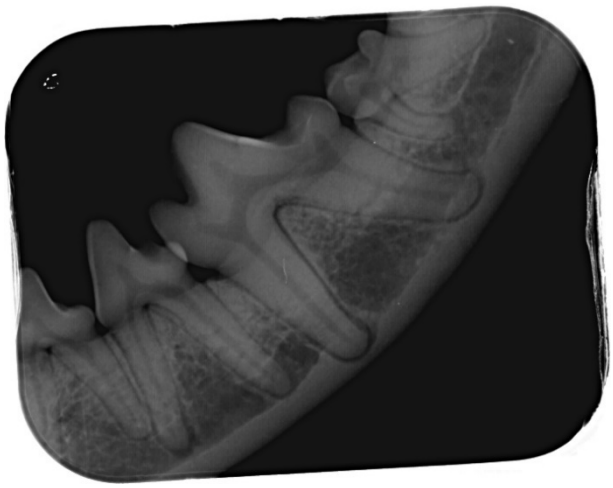


Figure 7

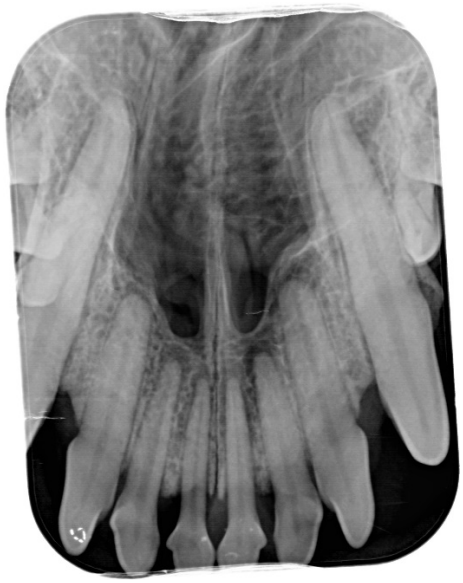


Figure 8

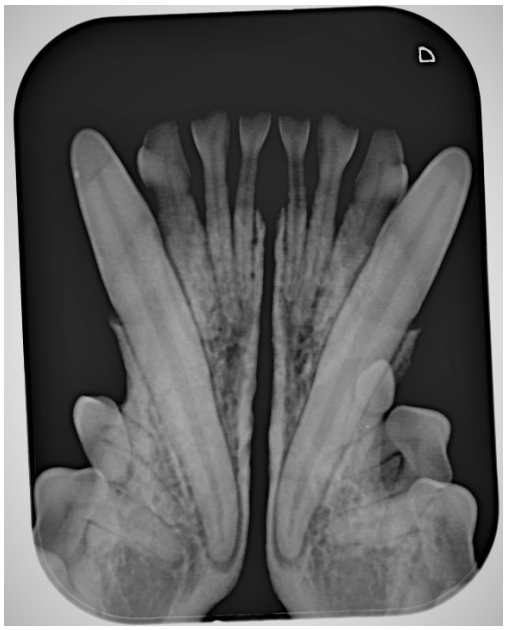


Figure 9

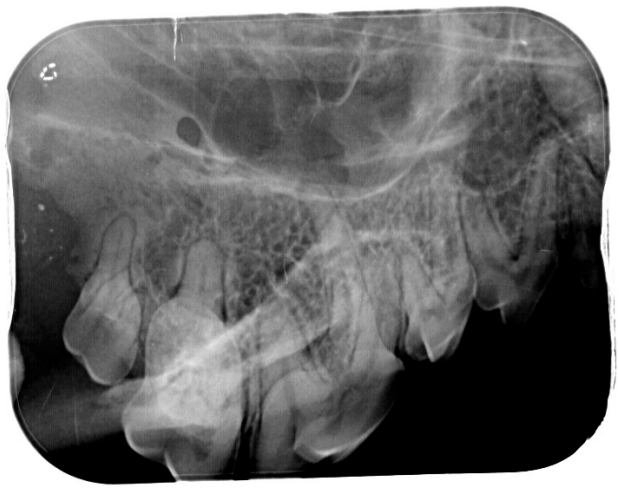


Figure 10

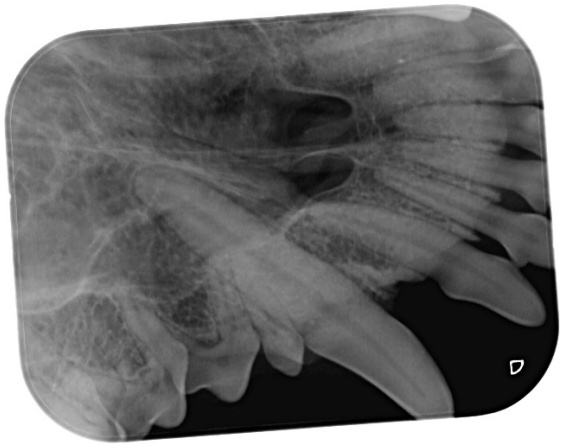


Figure 11

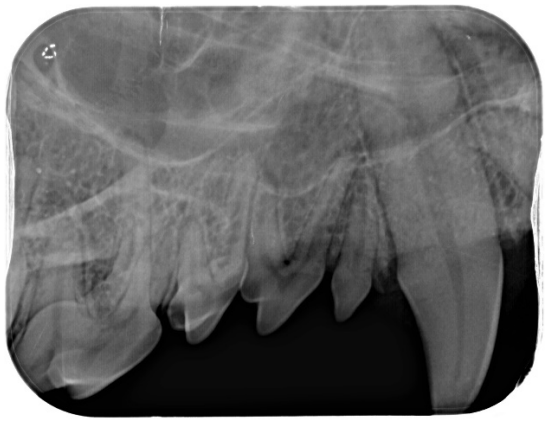


Figure 12

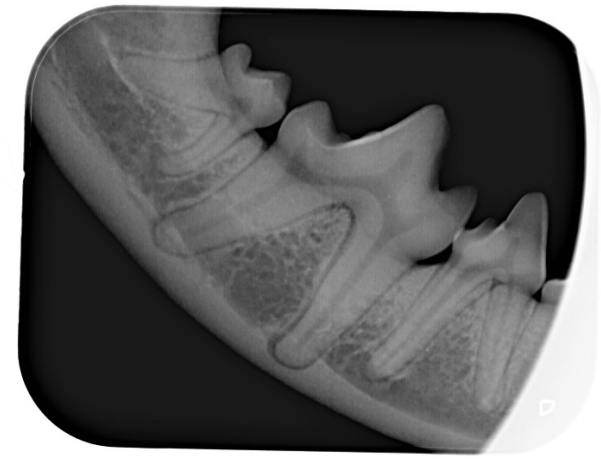


Figure 13

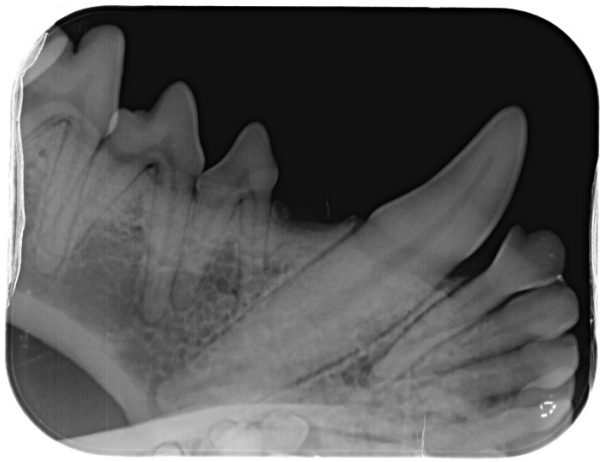


Figure 14

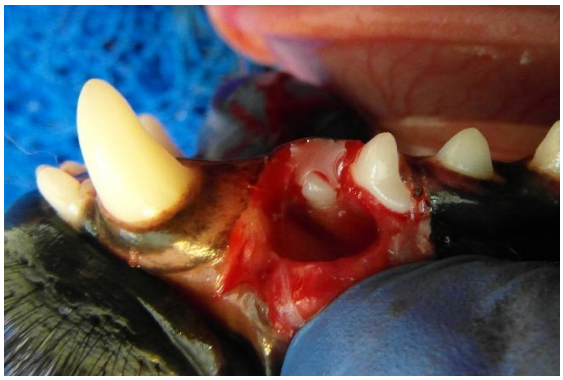


Figure 15. A mucoperiosteal flap is created and the cyst is visualized

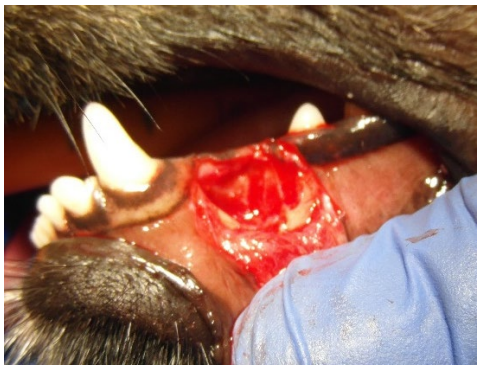


Figure 16. The 305 is extracted and the entire cyst lining removed

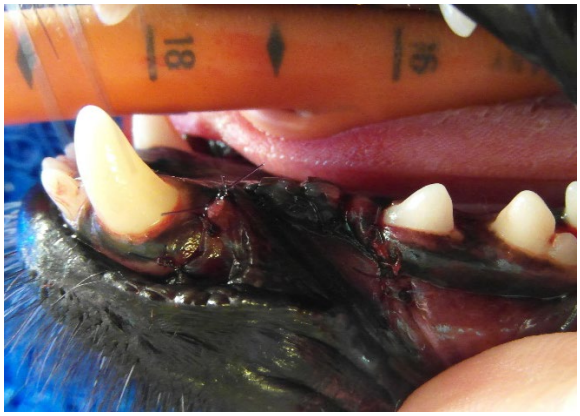


Figure 17. The mucoperiosteal flap is sutured in place

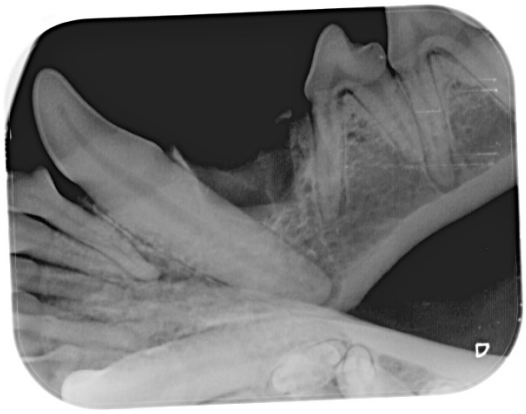


Figure 18. X-ray immediately after treatment

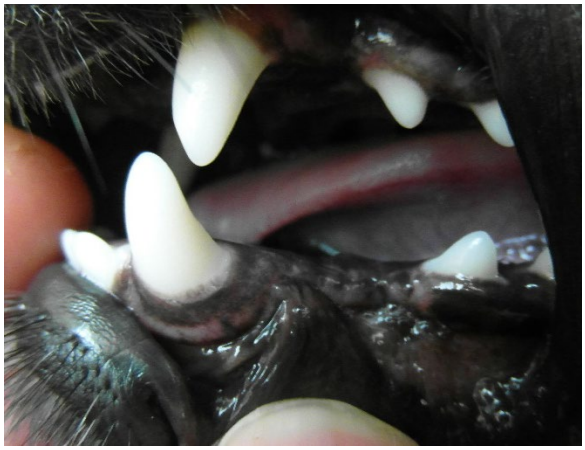


Figure 19. First follow up after 2½ months

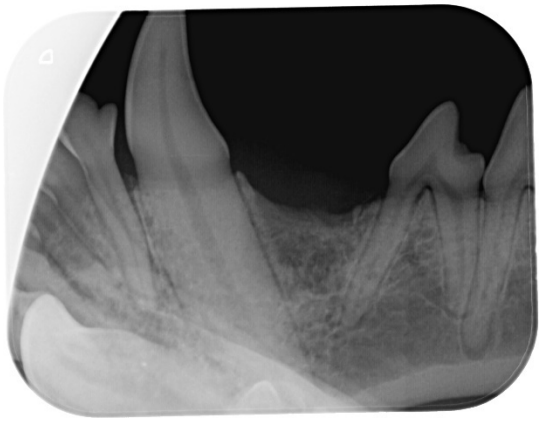


Figure 20. First radiographic follow up. New bone formation with no sign of cyst reformation.

Table 1: Blood test result (see PDF-file - below)

Table 2: Histopathological report from the external lab. (See PDF-File - below)

Table 3: Dental chart

Clinical and radiographic findings

M	B	D	P/L	Finding/treatment	Tooth		Tooth	Finding/treatment	M	B	D	P/L
					201		101					
					202		102					
					203		103					
	4			PD1, RPC	204		104					
				Missing	205		105					
					206		106					
					207		107					
					208		108					
					209		109					
					210		110					
					301		401					
					302		402					
					303		403					
					304		404					
				DTC	305		405	Missing				

					306		406					
					307		407					
					308		408					
					309		409					
					310		410					
				Missing	311		411	Missing				

M: Mesial probing depth

B: Buccal probing depth

D: Distal probing depthP/L: palatal or lingual probing depth

IDEXX LABORATORIES

Account ID:		**Pet-Owner:**		**Internal lab-number:**	
		Animal name:	Tilde	**Barcode number:**	
		Species:	Dog	**Date of receipt:**	
		Gender:	F	**Material:**	tissue material
		Age:	02 Y		

LAB REPORT: Tilde

material: tissue material

Histopathologic examination **1)**

CLINICAL HISTORY
2-year-old dog with a lesion in the mandible.
Clinical suspicion: Dentigerous cyst.

SUBMITTED MATERIAL
Four biopsies with a diameter of 2-8 mm.

HISTOPATHOLOGICAL DESCRIPTION
Samples consisting of connective tissue, parts of woven bone, and striated musculature; additionally, stratified squamous epithelium lining a cyst in two samples; mild hyperplasia; mild spongiosis; underlying connective tissue with spindle cells with wedge-shaped chromatin-rich nuclei and indistinctive cell borders, embedded in a fibrous matrix; low proliferative activity; fresh hemorrhage and ulceration of the epithelium in one sample.

DIAGNOSIS
Epithelial cyst with periodontal mesenchyme.

COMMENT
Histological examination revealed an epithelial cyst with close contiguity with periodontal mesenchyme. Overall presentation is compatible with dentigerous cyst. Signs of neoplastic transformation were not present. Significant inflammation was not evident.

Your sample was examined by:

Interpretation and comments:

1)
Histopathology and cytology results can be discussed
Monday to Friday, 11:00 h to 16:00 h.

Validated by:

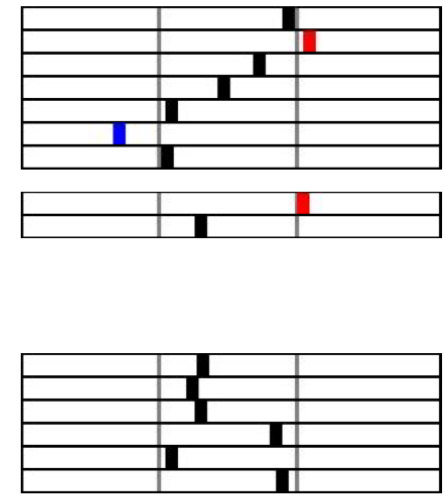
Our printed reports are valid without signature.
Information regarding the precise date of the test performance are available on request.
All test analysis is performed in our Laboratory and as such is included in the scope of accreditation unless otherwise indicated (DIN EN ISO/IEC 17025, D-PL-13356-01-00).

Client:
Patient Name: TILDE
Species: Canine
Breed:

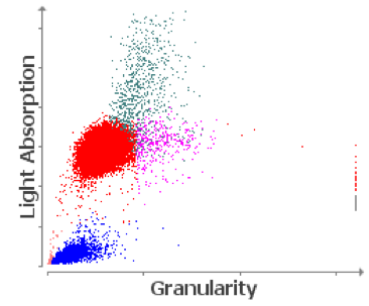
Gender:
Weight:
Age: 2 Years
Doctor:

LaserCyte (May 28, 2018 8:50 AM)

Test	Results	Reference Interval	LOW / NORMAL / HIGH
RBC	8.34 x10^12/L	5.50 - 8.50	
HCT	56.8 %	37.0 - 55.0	HIGH
HGB	16.4 g/dL	12.0 - 18.0	
MCV	68.1 fL	60.0 - 77.0	
MCH	19.7 pg	18.5 - 30.0	
MCHC	28.9 g/dL	30.0 - 37.5	LOW
RDW	14.9 %	14.7 - 17.9	
%RETIC	1.4 %		
RETIC	117.6 K/µL	10.0 - 110.0	HIGH
WBC	9.02 x10^9/L	5.50 - 16.90	
%NEU	58.7 %		
%LYM	17.7 %		
%MONO	9.2 %		
%EOS	14.4 %		
%BASO	0.1 %		
NEU	5.29 x10^9/L	2.00 - 12.00	
LYM	1.59 x10^9/L	0.50 - 4.90	
MONO	0.83 x10^9/L	0.30 - 2.00	
EOS	1.30 x10^9/L	0.10 - 1.49	
BASO	0.01 x10^9/L	0.00 - 0.10	
PLT	468 K/µL	175 - 500	
MPV	12.1 fL		
PDW	16.9 %		
PCT	0.57 %		

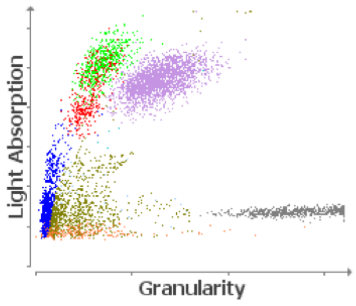


RBC Run



RBC RETICS PLT RBC Frags Doublets Qualibeads

WBC Run



NEU LYM MONO EOS BASO PLT AGG WBC Frags URBC Qualibeads

Printed:

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