

Down in the mouth

By Bernard Vaatstra

A laboratory survey looks at the prevalence of oral cavity proliferative lesions in dogs.

Diagnostic laboratories are in a unique position to be able to collate and document large numbers of pathological specimens. Oral masses in dogs represent a varied and interesting range of reactive, benign, malignant and inflammatory lesions. Given the widely varying prognoses and overlapping gross appearances of different oral mass types, biopsy remains a very important diagnostic tool to characterise these lesions.

A survey was undertaken of the prevalence of different types of oral proliferative lesions in dogs. Biopsy samples submitted to Gribbles Veterinary laboratories throughout New Zealand in the course of a two-year period (2021–22) were included. The results of the survey are summarised in table 1.

Overall, 72% of the masses were classified as neoplastic and 28% as non-neoplastic (reactive or inflammatory). Of the neoplastic lesions, 60% were considered benign and 40% malignant. Plasma cell tumours, acanthomatous ameloblastomas and amyloid-producing odontogenic tumours were included in the benign tumour statistics even though they can be locally aggressive, as they very rarely metastasise. Conversely, rare oral melanomas display benign histological features and clinical behaviour, but all were included in the malignant group for simplicity and given that the vast majority are aggressive.

The most common types of oral mass were odontogenic tumours – these included peripheral odontogenic fibromas (figure 1), acanthomatous ameloblastoma (figure 2) and rarer lesions such as amyloid-producing odontogenic tumours. Distinguishing between these tumour types is vitally important given their differing biological behaviour. While none of the common odontogenic

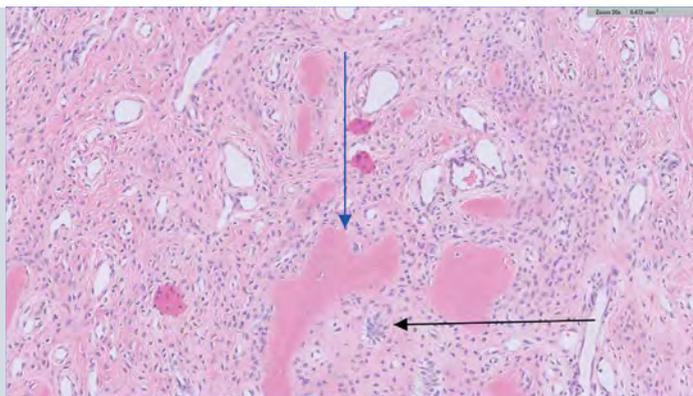


FIGURE 1: Peripheral odontogenic fibroma from the cranial mandible of a six-year-old Labrador. The tumour is mostly composed of spindle cells with islands of pink matrix (dentin/osteoid – blue arrow) and a few small nests of odontogenic epithelium (black arrow). Haematoxylin and eosin (H&E) 200x

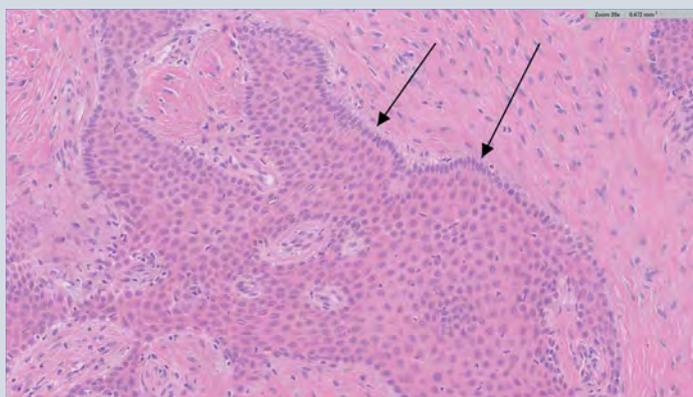


FIGURE 2: Acanthomatous ameloblastoma from the gingiva of a dog. The tumour is dominated by polygonal epithelial cells with distinct intercellular junctions and palisading around the periphery (black arrows). H&E 200x

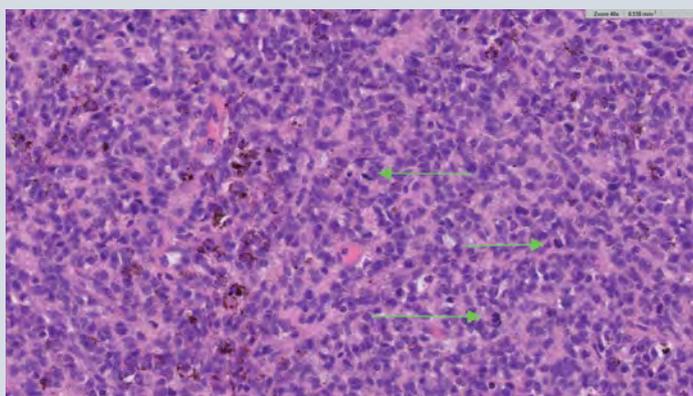


FIGURE 3: Melanoma from the caudal gingiva of a seven-year-old Rottweiler. The cells are poorly pigmented and pleomorphic with many abnormal mitotic figures (green arrows). H&E 400x

TABLE 1. Summary of canine oral proliferative lesions diagnosed through Gribbles Veterinary laboratories, 2021–22.

■ BENIGN NEOPLASTIC ■ MALIGNANT NEOPLASTIC ■ REACTIVE/INFLAMMATORY

ENTITY	NUMBER	%	MEAN AGE (RANGE)	PREDISPOSED BREEDS	COMMON LOCATIONS
Peripheral odontogenic fibroma	84	30.1	8.2 (3–14)	Labrador, Golden Retriever, Cocker Spaniel, Poodle, Jack Russell Terrier	Rostral maxilla, mandible
Melanoma	41	14.7	11.7 (7–15)	Labrador, Rottweiler, Golden Retriever, Poodle	Lips, gingiva, tongue
Focal fibrous hyperplasia	35	12.5	8.7 (3–12)	Schnauzer, Shih Tzu, Scottish Terrier	Rostral maxilla, mandible
Traumatic granulation tissue	26	9.3	9.6 (5–14)	Chihuahua, Poodle	Sublingual
Acanthomatous ameloblastoma	21	7.5	9.2 (6–13)	Labrador, Greyhound	Rostral mandible
Osteosarcoma	11	3.9	10.0 (5–15)	Brachycephalic breeds	Mandible, hard palate
Plasma cell tumour	10	3.6	8.1 (4–11)	Poodle, Cocker Spaniel, Jack Russell Terrier	Tongue
Fibrosarcoma	9	3.2	9.4 (5–12)	Labrador, Golden Retriever	Maxilla, mandible
Squamous cell carcinoma	8	2.9	9.6 (5–15)	Not applicable (NA)	Tonsil, gingiva, sublingual
Eosinophilic granuloma	8	2.9	8 (1–13)	Cavalier King Charles Spaniel, Siberian Husky	Palate
Lymphoma	7	2.5	12.1 (7–16)	NA	Lip, tongue
Haemangiosarcoma	5	1.8	11.5 (8–12)	Rottweiler, German Shepherd	Ventral tongue
Papilloma	4	1.4	3.5 (1–6)	NA	Tongue, gingiva
Foreign body reaction	3	1.1	5 (1–13)	NA	Tongue
Sialocoele/ranula	2	0.7	3 (1–5)	NA	Sublingual
Peripheral giant cell granuloma	2	0.7	9.5 (6–13)	NA	Mandible gingiva
Vascular ectasia	1	0.4	8	NA	Ventral tongue
Amyloid producing odontogenic tumour	1	0.4	9	NA	Gingiva
Tonsillar polyp	1	0.4	12	NA	Tonsil
TOTAL	279				

tumours tend to metastasise, peripheral odontogenic fibromas tend to be expansile whereas acanthomatous ameloblastomas are locally aggressive with a tendency to infiltrate underlying bone. As a side note, peripheral odontogenic fibroma, acanthomatous ameloblastoma and focal

fibrous hyperplasia have historically been termed fibromatous epulis, acanthomatous epulis and fibrous epulis respectively, reflecting their similar gross appearances (for example, see figure 4). However, the more specific designations are preferred given the differing prognoses.



FIGURE 4: Growth displacing the lower incisors of an 11-year-old English Staffordshire Bull Terrier. Grossly, it was not possible to determine whether this was benign or malignant. The mass was diagnosed histologically as ameloblastic carcinoma.

(PHOTO COURTESY OF CHRISTIE MCDONALD, POHUTUKAWA COAST VETS)

Dogs with malignant neoplasms (melanoma – figure 3, fibrosarcoma, osteosarcoma, squamous cell carcinoma and haemangiosarcoma) tend to be in the older age bracket on average. However, the wide age ranges for the different lesion types preclude a prediction of benign versus malignant based on age alone. Note also that fibrosarcoma of the maxilla and mandibles presents a diagnostic challenge. It may affect relatively younger dogs, presents as vague swelling and deformity rather than a discrete mass, and may be misdiagnosed as granulation tissue or fibrosis if only small biopsies are taken. Histopathology is particularly useful for melanomas given that microscopic features such as mitotic index, depth of invasion and nuclear atypia score help to predict the likelihood of aggressive behaviour, including distant metastasis.

Complex cases received at diagnostic laboratories are commonly reviewed by multiple pathologists, and even then consensus on the histological diagnoses is not always forthcoming.

Most non-neoplastic lesions have traumatic or inflammatory aetiologies. These include traumatic granulation tissue (aka sublingual granuloma, 'gum chewer syndrome'), foreign body reaction, sialocoele (salivary mucocoele), eosinophilic granuloma, peripheral giant cell granuloma and tonsillar polyp. In addition, focal fibrous hyperplasia lesions often represent an exuberant response to trauma or inflammation, although they can also develop spontaneously or within a background of generalised gingival hyperplasia.

Oral neoplasms occasionally diagnosed in dogs but not captured in this survey include mast cell tumour, histiocytoma, histiocytic sarcoma, granular cell tumour, rhabdomyosarcoma, primitive neuroectodermal tumour, multilobular tumour of bone and rare variants of odontogenic tumours such as ameloblastic carcinoma (figure 4).

Diagnostic conundrums are encountered disproportionately with oral lesions. Reasons for this include poor differentiation of neoplastic lesions (eg, amelanotic melanoma can resemble other tumour types), complex lesion types (odontogenic tumours), non-representative biopsies and difficult biopsies due to ossification and dense fibrous stroma. Complex cases received at diagnostic laboratories are commonly reviewed by multiple pathologists, and even then consensus on the histological diagnoses is not always forthcoming. In some cases the use of immunohistochemistry may help to characterise the cell types present in a lesion (especially useful for melanoma and round cell tumours). However, immunohistochemistry is not always definitive and may be compromised by a decalcification of bony masses.

It is important to note that incisional biopsies of larger masses are not always representative of the underlying process. If it is not possible to excise a mass completely, a generous wedge biopsy should

be collected and submitted with a complete history and, preferably, imaging findings and a gross photograph. On rare occasions, acanthomatous ameloblastomas and fibrosarcoma have been misdiagnosed as peripheral odontogenic fibromas or focal fibrous hyperplasia due to inadequacy of the initial biopsies. Follow-up biopsies once the lesions progressed allowed the diagnoses to be made.

Recommendations

- Do take a photograph of a lesion to accompany the laboratory submission – the gross appearance can be very helpful, especially when histological features are equivocal.
- Cytology may be diagnostic for fleshy masses (eg, melanoma, plasma cell tumour), but cell yield is often limited with fibrous, bony or vascular masses.
- Imaging of oral lesions is particularly useful in determining the presence of bony involvement or ossification. If possible, send a digital radiograph with the specimen to the laboratory.

- Excisional biopsies are generally preferred over incisional biopsies due to the risks of non-representative small biopsies and missed diagnoses. ⁽⁹⁾

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FURTHER READING:

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