Clinical communication — Kliniese mededeling

Infiltrative angiolipoma of the parotid salivary gland in a dog

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ABSTRACT

Solitary benign angiolipoma and infiltrative angiolipoma are rare tumours in dogs. Angiolipomatosis can be distinguished histologically from lipomatosis by the large number of tightly packed blood vessels seen between the adipocytes with multiple fibrin thrombi occupying some of the vessels’ lumens. The dog presented with a solitary slow-growing mass in the cervical region. Histopathology revealed multifocal to coalescing single or clusters of blood-filled vessels lined by flattened endothelial cells with narrow, elongated, basophilic nuclei. These regions were embedded in adipose tissue with multifocal areas of intervascular remnants of differentiated serous salivary glandular tissue with multifocal small ducts. Fibrin thrombi occupied a few of the vessel lumens. A histological diagnosis of infiltrative angiolipoma was made. On computed tomography, the mass was bilobed with a suspected primary component involving the right parotid gland which was grossly enlarged. The mass had a slightly hypoattenuating mottled to lobulated appearance with a few hyperattenuating mineralised specks throughout. Hounsfield units of the mass ranged between 40 and 45, which was less than the 60–65 of the contralateral salivary glands and cranial musculature. Post contrast images showed no contrast enhancement of 90 % of the mass with only a band of peripheral contrast uptake of the affected lateral lobe.

Keywords: angiolipoma, computed tomography, dog, histopathology, infiltrative, parotid, salivary gland.

INTRODUCTION

According to the World Health Organisation (WHO) classification of mesenchymal soft tissue tumours in domestic animals, benign tumours originating from adipose tissue can be divided into lipomata (with a sub classification of infiltrative lipomata) and angiolipomata. In contrast to domestic animals, 14 types of benign tumours of adipose tissue are recognised in humans. Lipomata consist of large adipocytes that are tightly packed and contain eccentric, dense nuclei and account for 7.1 % of all cutaneous tumours of non-lymphoid origin and occur in 16 % of all dogs.

Angiolipomatosis reported in dogs include 2 variants and are classified as infiltrative or non-infiltrative, as is done for lipomata. Angiolipomatosis, infiltrating angiolipoma and infiltrating lipomata are far less common than lipomata in veterinary medicine and canine infiltrating angiolipomata have only been reported twice previously. The solitary benign angiolipoma are commonly found in the subcutaneous tissue of the trunk. This report documents a case of infiltrating angiolipoma of the parotid salivary gland in a dog.

CASE HISTORY

A 6-year-old, 43.5 kg, spayed Boerboel bitch presented with a palpably firm, well circumscribed oval mass, attached to the underlying structures, on the right side of the neck, just caudal to the angle of the mandible and ventral to the ear. The mass measured 10 × 5 × 5 cm and was reported to have been growing slowly over approximately 18 months. Clinical examination revealed a healthy dog with no detectable abnormalities. Fine-needle aspirates were taken from the mass and yielded blood-diluted samples with inconclusive cytological findings. Ultrasonographic examination of the cervical mass was done using a Sonoline Omnia ultrasound machine (Siemens AG, Erlangen, Germany) with a multifrequency curvilinear array transducer operated at 7.5 MHz. The mass appeared well marginated, bilobed and hyperechoic with a slightly mottled echotexture. The caudolateral lobe measured 60 × 17 mm and the craniomedial lobe 46 × 17 mm. The latter was located just caudal to the horizontal ear canal. A provisional ultrasonographic diagnosis of salivary gland infection and reactive lymphadenopathy was made. No abnormalities were detected on thoracic radiographs taken for evaluation of lung metastases. This did not, however, rule out metastatic nodules, which are more readily detected by computed tomography (CT)

An incisional biopsy was taken from the mass. No infiltration of the mass was seen macroscopically in the skin and subcutaneous tissues. The mass was covered by a thin fibrous pseudocapsule on which multiple small (1 × 2 × 1 mm) islands of raised purplish tissue could be seen which were presumed to be tumour infiltration. The pseudocapsule was incised and a wedge biopsy taken, after which the capsule was sutured and the incision closed routinely. A minor amount of bleeding was present. A 3 × 4 × 2 cm haematoma developed ventral to the incision line following surgery, which resolved. The gross pathological appearance of the 1.5 × 1 × 0.5 cm formalin-fixed biopsy was mottled with small yellowish-white slightly raised areas (Fig. 1). Examination of haematoxylin & eosin-stained, routinely prepared sections by light microscopy revealed multifocal to coalescing single or clusters of blood-filled vessels lined by flattened endothelial cells with narrow, elongated, basophilic nuclei; however, occasional nuclei were slightly plump. These regions were surrounded by and embedded in adipose tissue and there was a thin intervascular fibrous connective tissue stroma. Within this region there were multifocal regions of intervascular remnants of differentiated

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serous salivary glandular tissue with multifocal small ducts (Fig. 2). Fibrin thrombi occupied a few of the vessel lumens (Fig. 3).

Blood oozed from the incision line starting 4 days after the biopsies were taken. The aetiology was uncertain but trauma to the area was suspected. Two weeks later the dog had a CT examination to evaluate potential thoracic metastasis and the extent of the mass and infiltration for surgical planning. At presentation the dog had a small 1 × 2 cm well granulating wound in the distal aspect of the original biopsy site. The dog was premedicated intravenously with morphine sulphate (Morphine sulphate Fresenius PE, Fresenius kabi, 10 mg/ml) at a dose of 0.2 mg/kg and diazepam (Pax, Aspen pharmacare, 10 mg/2 ml) at a dose of 0.4 mg/kg. Five minutes later the dog was induced with intravenous Propofol (Diprivan, AstraZeneca, 10 mg/ml) at a dose of 4 mg/kg and maintained under anaesthesia using isoflurane (Halocarbon, Halocarbon Products Corporation). The patient was placed symmetrically in sternal recumbency with her thoracic limbs pulled cranially. A CT was performed with an Emotion Duo helical dual slice CT machine (Siemens AG, Erlangen, Germany). Non-contrast scans were performed on the thorax and head region followed by manual intravenous contrast administration (1 ml/kg Iohexal 300 mg/l (Omnipaque 300, GE Healthcare)) as a bolus followed 5 minutes later by another head scan. The images were examined in bone, lung and soft tissue windows and were reconstructed into dorsal and sagittal planes. There was no evidence of thoracic or regional lymph node metastasis or underlying osseous changes. The mass was bilobed with a suspected primary component involving the right parotid gland which was grossly enlarged and measured 81 × 27 × 29 mm. Cranioventrally the mass extended medially to form another lobe measuring 56 × 31 × 49 mm medial to the mandibular salivary gland. The mass displaced the trachea and associated structures to the left and ipsilateral mandibular salivary gland to the right. The mass had a slightly hypo-attenuating mottled to lobulated appearance with a few hyperattenuating mineralised specks throughout. Ventrolaterally to the mass 2 small pockets of gas were seen. The mass appeared to involve the insertions of both the sternothyroideus and the sternohyoideus muscles. The Hounsfield units (HU) of the mass were in the range of 40–45, which was less than the 60–65 of the contralateral salivary glands and cranial musculature. Post contrast images of the mass.
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a,b). This appeared to be consistent with
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normal salivary tissue as the normal sali-
vary glands uptake had a similar HU.

The owner declined further surgery. However, 14 months after diagnosis the
dog is reported to be doing well although
the mass has increased in size by approxi-
mately 30 %.

DISCUSSION

Lipomata are frequently seen in small
animals; female dogs and entire male
cats seem to be predisposed. Tumours
of adipose tissue can be divided into infil-
trating lipomata, angiolipomata and
liposarcomata. Recently other benign
tumours of adipose tissue, such as chon-
drolipoma, osteolipoma, fibrolipoma,
and angiolipoleiomyoma have been
described in dogs and cats. Chon-
drolipomata and osteolipomata are
thought to be related to metaplastic
differentiation of a normal lipoma with
the aetiology thought to be related to local
trauma, normal mesenchymal reactivity
and close association with periosteum
and joints. Angiolipomata are broadly
classified as either infiltrative or solitary
and appear to be rare tumours in dogs. To
the authors’ knowledge, only 2 cases of
canine infiltrative angiolipomata have
previously been described. Histological
examination of these tumours is neces-
sary for a definitive diagnosis.

Infiltrative angiolipomata, like infiltr-
trative lipomata, are locally aggressive as
seen in the case reported here. The authors
believe that the slow-growing nature of
angiolipomata and the apparent lack of
propensity to metastasise make debulking
the masses a good treatment option. Soli-
dary benign angiolipomata, on the other
hand, respond well to surgical excision
and have a low propensity for local recur-
rence.

In this case, an infiltrative angiolipoma
occurred in the parotid salivary gland
and although large, the mass had much
the same shape as the parotid salivary
gland. Grossly the tumour was covered
by a thin pseudcapsule.

On CT, the mass appeared to have broken
through the pseudcapsule ventr-
medially to extend medially and form an
additional neoplastic mass medial to the
mandibular salivary gland. The HUs of
the mass was slightly less than the normal
soft tissues due to the lipomatous infiltra-
tion. Fat has a HU of about –80 to –100 in
infiltrating lipomata the tissue has a
marked hypoaettenuating appearance.
In this case, the lack of marked hypo-
attenuation implies that other soft tissues
were combined with the fat as can be
seen in the histopathological sections.
Computed tomography allowed good
delineation of the tumour as reported
previously in studies of infiltrative
lipomata. Hyperattenuating areas
visible on the periphery of infiltrating
lipomata after the administration of con-
trast can occur post-surgery. In this case,
a incisional biopsy was taken 2 weeks
prior to the CT examination and could
have contributed to the ventrolateral rim
hyperattenuation. However, the dorsal
rim was far away from the surgical site
and it is believed that the hyperattenua-
ting rim was just remnant non-affected
parotid tissue. The ventrolateral gas
accumulation was due to the earlier surgical
wound breakdown.

Minimal bleeding from the mass was
noted when the tumour was incised. How-
ever, the haematoma that formed
after biopsy may indicate that more
persistent low-level bleeding may be a
potential problem. The authors found it
unusual that the mass was not enhanced
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persistent low-level bleeding may be a
potential problem. The authors found it
unusual that the mass was not enhanced
after contrast administration. This could
vary depending on the amount of blood
cells present in the mass or could be
related to decreased vascular supply due
to occlusion of the blood vessels by micro-
thrombi.

Although neither this dog nor dogs
reported in another study showed pain,
pressure on surrounding structures may cause pain, interference of movement, pressure atrophy and discomfort as seen with infiltrative lipomata\(^1\). Surgery can be used as the sole method of treatment, but other alternatives like external beam radiation could potentially be employed alone or in combination with surgery for local tumour control as is done with infiltrative lipomata\(^2\). In humans, hamartomatous angiolipoma and angiolipoma of the parotid salivary gland have been reported\(^3,4\), but no case report exists for their infiltration into the parotid salivary gland in dogs.

**CONCLUSION**

Although rare, it is important to consider angiolipoma as a differential diagnosis for subcutaneous nodules/masses. They can be difficult to diagnose with fine needle aspirates but biopsy gives the definitive diagnosis. This is particularly true when trying to differentiate sparsely vascularised lipomata from angioporeioneoma. This is particularly true when trying to differentiate sparsely vascularised lipomata from angioporeioneoma. In humans, hamartomatous angiolipoma and angiolipoma of the parotid salivary gland have been reported\(^5,6\), but no case report exists for their infiltration into the parotid salivary gland in dogs.

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**REFERENCES**

6. Hattori H 2005 Epidural angiolipoma is histologically distinct from its cutaneous counterpart in the calibre and density of its vascular component; a case report with review of the literature. *Journal of Clinical Pathology* 58: 882–883