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# Sublingual sialocele in a cat

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## Abstract

**Case summary** A 1-year-old male neutered cat was presented with a right-sided swelling of the floor of the oral cavity, causing dysphagia and hypersialorrhoea for 2 months. Fine-needle aspiration of the mass and CT were suggestive of a right sublingual sialocele with no obvious cause. Surgical resection of the ipsilateral sublingual–mandibular salivary gland complex, as well as marsupialisation of the mucocoele, was performed. The cat recovered uneventfully. Histopathological examination of the resected specimen confirmed the diagnosis. No sign of recurrence was reported 7 months after surgery.

**Relevance and novel information** Overall, sialocoeles are rare in cats but sublingual mucocoele is the most common form. Diagnosis is usually straightforward and the use of CT to help localise the affected site and possibly identify a cause has been infrequently described. Surgical treatment recommendations have been updated, which also makes a refresher of this uncommon condition likely to be of interest to the feline practitioner.

**Keywords:** Salivary glands; salivary mucocoele; sialocele; computed tomography; soft tissue surgery

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## Introduction

Five major salivary glands are described in cats (mandibular, sublingual, parotid, zygomatic and molar) vs only four in dogs (molar is not described).<sup>1–3</sup> Sialocoeles can affect all but the molar gland.<sup>1–5</sup> It is assumed that they result from disruption of a salivary gland or duct leading to extravasation and collection of saliva in soft tissues close to a salivary gland.<sup>2</sup> Overall, sialocoeles are rare and more frequent in dogs than in cats.<sup>1–12</sup> Sublingual mucocoele, characterised by a sublingual intraoral swelling, is the most frequently encountered form of sialocele in feline patients.<sup>1,3–6,13</sup> Diagnosis is usually straightforward and various treatment options have been proposed. Currently, surgical excision of the sublingual–mandibular gland complex and its ducts, as well as marsupialisation of the mucocoele, is considered the treatment of choice for this condition.<sup>1,3,4,6,7,14</sup>

## Case description

A 1-year-old neutered male domestic shorthair cat was presented with a 2 month history of swelling under the right side of the tongue. No other clinical signs were present at first, but recurrent episodes of hypersialorrhoea

and dysphagia gradually appeared. On two occasions approximately 1 month apart, fine-needle aspirate drainage of the swelling had been performed by the attending veterinarian, but without long-term improvement owing to the re-collection of fluid. The second time, results of cytological examination of a smear directly prepared from the fluid had been typical of a salivary mucocoele aspirate with abundant glycoproteic material and scarce, foamy macrophages. No other fluid analysis results (eg, protein content, pH, culture) were available.

The cat did not have any history of trauma, even though it was periodically allowed outdoors. On physical examination, the cat was quite alert and responsive, with a body condition score of 5/9. A left-sided tongue deviation caused by a 2 cm fluctuant, non-painful mass was observed (Figure 1a). The mucous membrane over the

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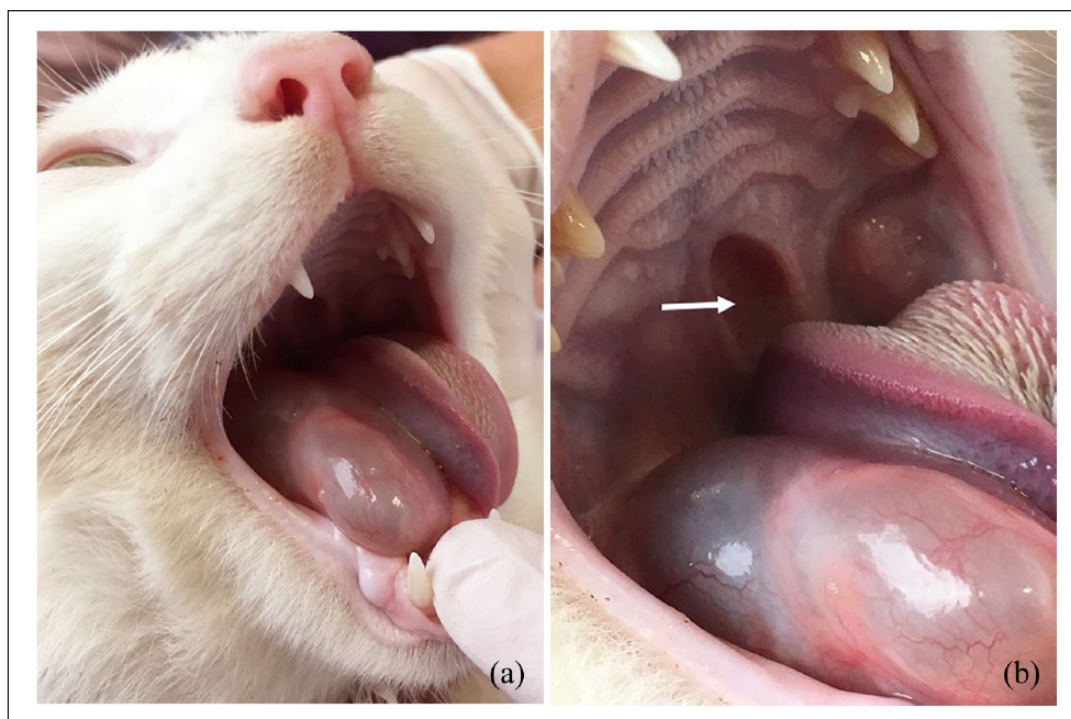
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**Figure 1** (a) Photograph of the sublingual sialocele. (b) Photograph of the soft palate showing ulceration (arrow) due to friction from the deviated lateral edge of the tongue

soft palate was eroded by the deviated lateral edge of the tongue (Figure 1b). The remainder of the clinical examination was unremarkable. A tentative diagnosis of salivary mucocoele, rather than neoplasia, abscess, foreign body or granuloma, was considered reasonable. A minimum laboratory database (microhaematocrit, total proteins, blood urea nitrogen, creatinine) was unremarkable.

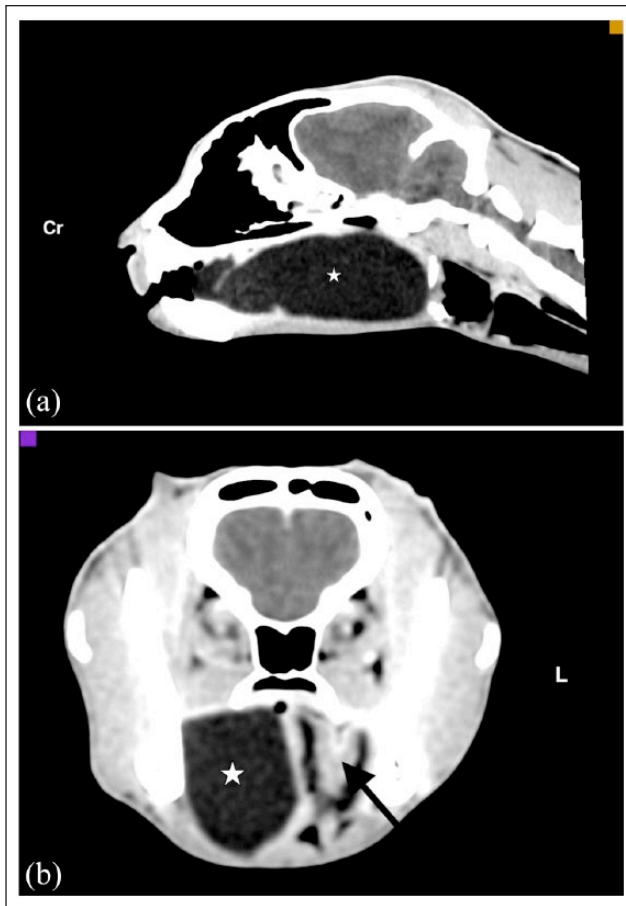
A CT scan was performed under general anaesthesia in an attempt to determine which glands were affected and possibly to identify an aetiology. A large, well-defined mass with fluid density, with no contrast enhancement after intravenous (IV) injection, was observed within the right mandibular soft tissues. This structure exerted a significant mass effect in the oral cavity and on the right larynx (Figure 2). No osteolysis was observed. A diagnosis of right sublingual sialocele without any demonstrable cause was made.

As either gland could have been implicated, surgical removal of both the right sublingual and mandibular salivary glands was performed. The cat was premedicated with methadone (0.2 mg/kg IV) and midazolam (0.2 mg/kg IV), anaesthesia was induced with propofol (3 mg/kg IV), endotracheal intubation was performed and anaesthesia was maintained with isoflurane in oxygen. The patient was positioned in dorsal recumbency and a skin incision, starting 3 cm caudal to the mandibular ramus and extending to the mandibular symphysis, was made.

After incision of subcutaneous tissues and platysma muscle, tissues were bluntly dissected with Metzenbaum scissors to expose the mandibular and sublingual salivary glands. After incision and retraction of the capsule that surrounds both salivary glands, the mandibular gland was retracted to enable blunt dissection of the salivary duct and of the lobular salivary gland, which are located under the digastric muscle. Care was taken to avoid the lingual nerve. The salivary duct was then ligated and transected, and the gland complex was removed (Figure 3). The wound was closed conventionally, in three layers. Finally, the sialocele was excised intraorally with Metzenbaum scissors and the oral mucosa was sutured to the edges of the sialocele by two continuous patterns, with absorbable monofilament suture (PDS 3-0; Figure 4).

Histopathological examination of the salivary glands (unremarkable) and the sialocele was performed. The wall of the sialocele was slightly inflamed, with lymphocytes and plasma cells being the most numerous leukocytes. (Figure 5).

Postoperative analgesia was achieved with IV morphine (0.1 mg/kg q4h for 24 h) and a non-steroidal anti-inflammatory drug (meloxicam 0.1 mg/kg PO q24h for 5 days). The cat was discharged 3 days after surgery. Fifteen days and 2 months after surgery all clinical signs had resolved. Seven months after surgery, a telephone consultation confirmed the absence of recurrence.



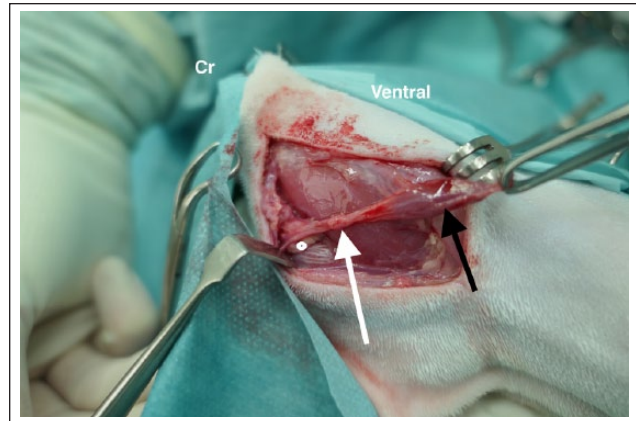
**Figure 2** (a) CT image, sagittal view, of the patient's head. Note the dilated cystic lesion (white star). (b) CT image, transverse view, of the patient's head. The sialocoele (white star) displaces the tongue laterally (arrow). Cr = Cranial

## Discussion

Reported causes of sialocoeles are trauma to the duct system or to the gland, sialoliths, foreign bodies, bite wounds or neoplasia.<sup>1-5,7,9,11,15</sup> Most often the aetiology remains unknown, as in our case; although, trauma could not be fully ruled out from the differential diagnosis here, as the cat had some outdoor access.

Sublingual, cervical or pharyngeal sialocoeles can occur according to the site of saliva collection when a defect occurs to the sublingual mandibular complex. Therefore, in addition to any discernible swelling, cats with such salivary mucocoeles can present with dysphagia, ptyalism and/or potentially life-threatening upper respiratory tract obstruction.<sup>1,4,7,9</sup> In cats, sublingual sialocoeles are the most commonly described, whereas in dogs cervical sialocoeles are most common.<sup>1-4,6,7</sup>

Although only a few cases have been described in cats, sialocoeles should be part of the differential diagnosis of any swelling of the sublingual area. Fine-needle aspiration and cytological examination of the sample, as performed by the attending veterinarian in our case, are



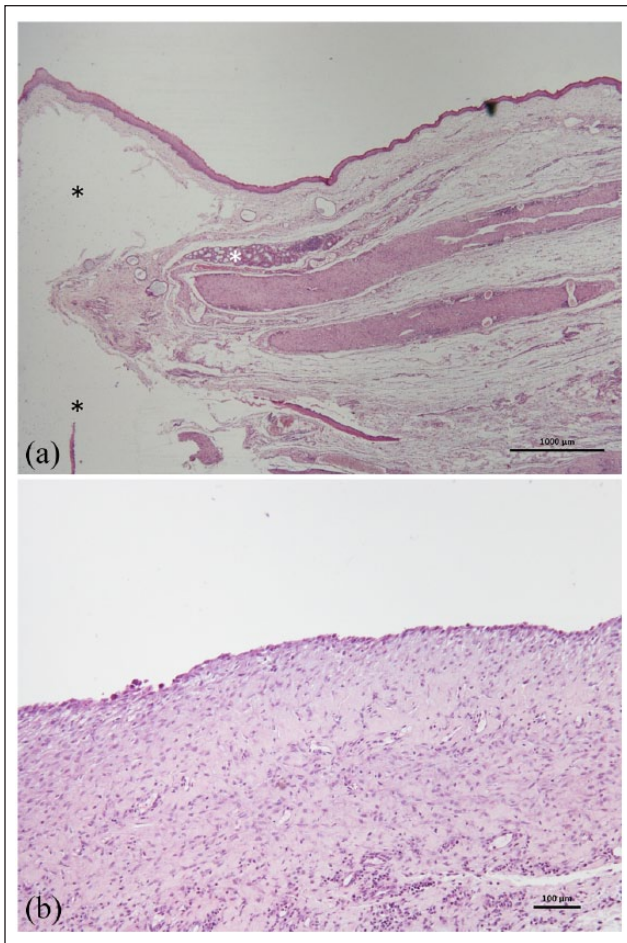
**Figure 3** Perioperative photograph of the mandibular-sublingual salivary gland complex. Note the mandibular gland (black arrow), the monostomatic portion of the sublingual gland (white arrow) and the polystomatic portion (white disc). Cr = Cranial



**Figure 4** Postoperative photograph of the marsupialisation

recommended to confirm the diagnosis and rule out other causes.<sup>1-5,7,9,11</sup> In order to precisely locate the affected glands, and to further define any underlying aetiology, sialography, ultrasonography, CT or MRI can all be considered.<sup>1,4,5,11</sup>

Sialography, which involves injection of radio-opaque material into the ductal openings in the mouth, can be technically challenging, especially in cats.<sup>2,5,7,11</sup> Ultrasonography is reportedly more useful for cervical and zygomatic sialocoeles.<sup>4,11</sup> CT is an interesting alternative method as all the salivary glands can be easily identified and the cause of the leak can sometimes be identified.<sup>4,14,16</sup> Moreover, it can clearly show the gland(s) and tissue(s) involved, giving added confidence to the surgical approach and management, whereas gross appearance can, on occasion, potentially be misleading. MRI, which offers a superior soft tissue resolution, can also be used, but has other disadvantages, in particular a longer data acquisition time and



**Figure 5** (a) Histopathology slide showing parts of the sialocoele (black asterisks) visible in the soft tissues beneath a normal salivary lobule (white asterisk). Haematoxylin and eosin  $\times 20$ . (b) Histopathology slide from the wall of the sialocoele, comprising well-vascularised mature fibrous connective tissue. Note the lack of a secretory epithelium on its inner surface. Haematoxylin and eosin  $\times 100$

lower precision for detection of soft tissue mineralisation.<sup>14,16</sup> In our case, where the lesion was unambiguously lateralised on the right side, performing CT was not mandatory from a surgical perspective, but may have identified a possible cause, in particular sialoliths, even if these are rare.<sup>8,13,16</sup>

Many options have been described for surgical treatment of a sublingual sialocoele: draining of the mucocoele alone, removal of the entire gland complex (mandibular and sublingual glands), marsupialisation of the sublingual sialocoele or a combination of the last two techniques.<sup>1–4,7</sup> In general, draining of the mucocoele or marsupialisation alone are not recommended owing to a high associated risk of infection and/or frequent recurrence.<sup>1,2,4</sup> Removal of the sublingual and mandibular salivary glands and marsupialisation of the mucocoele in the oral cavity is currently considered as the best

surgical option,<sup>1,3,4,6,7</sup> and is associated with a low level of recurrence.<sup>1,4,7</sup> Removal of both sublingual and mandibular glands (ie, the whole gland complex) is required because both glands are closely associated and could share the same common papilla,<sup>1,7,10,14</sup> even if the poly stomatic portion of the sublingual salivary gland is suspected to be the most frequently implicated in sublingual sialocoele formation.<sup>2,5,7</sup>

## Conclusions

Sublingual sialocoele is occasionally seen in cats and should be considered whenever a sublingual fluctuant swelling is visualised. Clinical diagnosis is usually straightforward, but lateralisation of the salivary glands involved in the saliva collection is required and can be more challenging. Surgical removal of the affected mandibular and sublingual glands, along with intraoral marsupialisation of the mucocoele, is usually curative.

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