

SURGICAL MANAGEMENT OF SALIVARY MUCOCELE IN DOGS

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ABSTRACT

A review of salivary mucocele in 6 dogs is discussed here. In five cases presented with ranula, marsupialization was done by derroofing the ranula and in one case of cervical mucocele, mandibular-sublingual sialadenectomy was performed. No major complications were reported in the cases.

Key words: salivary mucocele, ranula, dogs

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INTRODUCTION

When saliva from a traumatized salivary gland gets collected within the subcutaneous tissue, it is called a sialoceles. If the saliva collects in the intermandibular space, angle of the jaw or the upper cervical region, it is called a cervical mucocele. Ranula is a sublingual salivary mucocele lined by inflammatory connective tissue. Here the saliva from an injured salivary duct or gland will leak into the sublingual tissue caudal to the sublingual and mandibular duct opening (Fossum, 2007;

Hedlund, 2002). This leaked saliva elicits an inflammatory response leading to the formation of a pseudocapsule around this leaked saliva lined by connective tissue. If the inflammation is chronic it can lead to osseous metaplasia of the pseudocapsule (Olimpo *et al.*, 2023). Most commonly the cause of sialoceles is idiopathic, while other etiologies are trauma from dog attack or accident, choke collar training and chewing sticks, neoplasia, sialolith, dirofilariasis, sialoadenitis, lancing of abscess, presence of foreign bodies, hypercortisolism and long term glucocorticoid treatment (Bae *et al.*, 2024; Porsmoguer *et al.*, 2023; Swieton *et al.*, 2022).

MATERIALS AND METHODS

Six animals presented with sialoceles were included in the study as given in Table 1. All cases had a history of anorexia or

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hyporexia, drooling of saliva was reported in two cases. The cervical sialocele was presented after 6 months of occurrence as the swelling was not responding to treatment and the dog was hyporectic. The diagnosis of ranula and sialocele was done by physical examination and fine needle aspiration cytology. Palpation revealed a soft, painless fluctuant mass below the tongue in ranula and in the intermandibular space in cervical sialocele. Fine needle aspiration cytology revealed blood tinged viscous saliva with low cellularity in all the cases. Radiography of the skull revealed fluid opacity in the area of swelling, i.e., intermandibular region (Fig.1.). Deroofing of the ranula was done by incising the roof of the sublingual swelling using a blade no. 10 and the remaining edges of the cyst were everted and sutured to the adjacent vestibular mucosa using Polyglactin 910 – 1-0 suture material in simple interrupted pattern (Fig.2.). The anaesthetic protocol employed in the procedures are given in Table 1. Sialadenectomy was performed by a lateral approach as per Kumar *et al.* (2020) as the case was refractory to surgical drainage. Before sialadenectomy, the patient was positioned in dorsal recumbency and the neck was kept in an extended position to identify the side of affected salivary gland (Fig.3). For sialadenectomy the dog was positioned in lateral recumbency with the affected side up. The skin, subcutaneous tissues, and platysma were incised from the angle of the mandible caudally to the external jugular vein. The mandibular and monostomatic sublingual salivary glands were dissected extracapsularly. Blood vessels on the dorsomedial aspect of the

gland were ligated with Polyglactin 910 1-0 suture material. Dissection was continued rostrally to remove the lingual nerve that carries secretomotor nerve fibres to the sublingual salivary gland and to remove the sublingual salivary gland tissue completely (Fig. 4). The sublingual duct was ligated at the level of the lingual nerve. The vessels of duct and gland complex was ligated with absorbable chromic cat gut no.1 suture and transected. Deep fascial planes were closed with absorbable chromic catgut no. 1 in a simple continuous pattern. Subcutaneous tissues were closed with absorbable chromic catgut no. 2-0 suture in a simple continuous pattern. Skin was closed with non-absorbable silk no.1-0 in a cruciate pattern. Post-operative antibiotic therapy was given with inj. ceftriaxone @ 25 mg/kg b. wt. intravenously, inj pantoprazole @ 1 mg/kg b. wt intravenously, inj. chlorpheniramine maleate @ 0.5 mg/kg b. wt. intramuscularly for five days and inj. meloxicam @ 0.3 mg/kg b. wt intramuscularly for three days. The dog bite cases underwent post-exposure antirabies vaccination. Three cases of sublingual sialocele showed no recurrence after a short term follow up of one month. Two of the sublingual sialocele cases did not show any recurrence till 10 days follow up. The long term follow up of cervical sialoadenocoele after one and a half year was good with no recurrence.

RESULTS AND DISCUSSION

In this study, all the affected dogs were in a mean age group of 2.01 ± 2.05 years with age ranging from 3 months to 6 years, and 83% of the affected dogs were

males. This young age at presentation and pronounced male preponderance is concurrent with the findings of Tsioli *et al.* (2025), who reported a median age of 3.5 years and an identical male predominance among affected dogs. The traditionally reported breed predisposition for German Shepherd Dogs and Miniature Poodles was not reflected in the present cases. In the present study, only Spitz, Chippi, Non-Descript and Hound breeds were affected, a finding that is in line with the larger multi-institutional study of Cinti *et al.* (2021), who found that crossbred dogs were the most frequently represented breed undergoing sialoadenectomy, suggesting that classical breed associations may be geographically variable across canine populations.

Confirmatory diagnosis in all six cases was achieved through physical examination and fine needle aspiration cytology alone, which was sufficient given the typical superficial, fluctuant presentation of ranula and cervical mucocele. Tan *et al.* (2022) stated that Computed tomographic sialography could reliably delineate the affected gland and duct in 22 surgically confirmed canine sialoceles, thereby reducing the artefacts seen in conventional contrast sialography. This could aid in precise presurgical planning. CT imaging may be a useful adjunct in future cases where the gland of origin is uncertain.

There was no recurrence noticed in the five cases that underwent marsupialization for ranula over a follow up period of one month (three cases of sublingual sialoceles), 10 days (two cases

of sublingual sialoceles) and one year (cervical sialoceles). Mild swelling was noticed after one day of sialadenectomy which subsided five days after antibiotic therapy. The complete resolution following marsupialization of sublingual sialoceles is in contrary to recent literature, where recurrence after marsupialization alone has been reported as considerably higher; Payne *et al.* (2025), in a retrospective series of nine dogs, recorded recurrence in three cases (33.3%) at a median of 20 days postoperatively, two of which subsequently required ipsilateral sialoadenectomy. The absence of recurrence in the present study may be related to the small study population and short follow up period rather than the chronicity of the condition as all cases of sublingual sialoceles were reported within a week of occurrence though the cervical sialoceles were reported after 6 months.

For the single case of cervical mucocele, mandibular-sublingual sialadenectomy resulted in only transient, mild swelling without recurrence, infection, or nerve deficit. Cinti *et al.* (2021), found that a ventral paramedian approach was associated with a significantly lower risk of recurrence than a lateral approach, although at the cost of a higher rate of wound-related complications. This finding is in contrary to the lateral approach used in the present case and but our findings are consistent with the findings of Kumar *et al.* (2020) where a lateral approach was associated with no recurrence. The absence of wound complications here suggests that meticulous haemostasis and layered closure can mitigate

this recognized compromise. Similarly, Swieton *et al.* (2022) reported intraoperative complications like iatrogenic oral mucosal tears, ligature slippage, haemorrhage, and lingual nerve injury. In contrary to this, there were no complications in the present case which could be due to the careful blunt dissection and secure vessel ligation. It could be concluded that regardless of the specific surgical approach chosen, complete excision of the mandibular-sublingual

gland-duct complex, remains the most reliable determinant of a recurrence-free outcome in cervical sialoceles cases. The absence of any major complications like severe haemorrhage, infection, or recurrence emphasizes the importance of meticulous blunt dissection, secure ligation of the caudal glandular vessels, and careful preservation of regional neural structures like the lingual nerve during sialadenectomy.

Table.1. Signalment, type of sialocele and anaesthetic protocol of dogs presented with sialocele

Species	Breed	Age	Sex	Etiology	Type of Sialocele	Anaesthetic Protocol used
Canine	Spitz	1.5 year	M	Dog bite	Sublingual	¹ X-K-D-Isoflurane
Canine	ND	3m	M	Dog bite	Sublingual	² X-K-D
Canine	Chippi	2 year	F	Idiopathic	Sublingual	X-K-D
Canine	Chippi	10 m	M	Idiopathic	Sublingual	³ X-D-K-Propofol
Canine	Hound	6 year	M	Idiopathic	Cervical	⁴ X-B-D-K
Canine	ND	1.5 year	M	Idiopathic	Sublingual	X-B-D-K

1. Xylazine pre-anesthesia @ 1mg/kg b. wt. i/m, Ketamine Diazepam induction (1:1) @ 5 mg/kg b. wt and 0.5 mg/kg b. wt. i/v and Isoflurane maintenance (1-2.5 %)
2. Xylazine pre-anesthesia @ 1mg/kg b. wt. i/m, Diazepam Ketamine induction (1:1) @ 5 mg/kg b. wt and 0.5 mg/kg b. wt. i/v and propofol maintenance (to effect)
3. Xylazine pre-anesthesia @ 1mg/kg b. wt. i/m, Diazepam Ketamine induction (1:1) @ 5 mg/kg b. wt and 0.5 mg/kg b. wt. i/v and maintenance
4. Xylazine @ 1mg/kg b. wt. i/m and butorphanol @ 0.2 mg/kg b. wt. i/v pre-anesthesia, Diazepam Ketamine induction (1:1) @ 5 mg/kg b. wt and 0.5 mg/kg b. wt. i/v and maintenance



Fig.1. The lateral radiograph of the skull showing fluid opacity in the intermandibular swelling

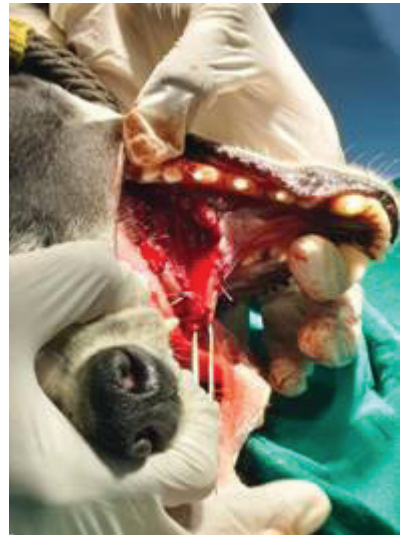


Fig. 2. The edges of the cyst were excised and sutured to the surrounding vestibular mucosa using Polyglactin 910 no. 1-0 suture material in simple interrupted pattern



Fig.3. The dog was placed in dorsal recumbency to ascertain the side of salivary gland duct affected.

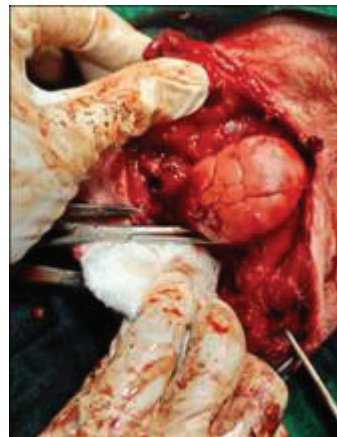


Fig.4. The submandibular salivary gland exposed during lateral approach

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