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## Surgical management of salivary mucocele in a nondescript male dog

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### Abstract

A six years old non descriptive intact male dog weighing 19 kg was brought to Madras Veterinary Teaching Hospital at small animal surgery outpatient unit with the history of progressive submandibular swelling for the past ten days following dog bite. On clinical examination, a soft fluctuating mass was palpable on the right submandibular region. The swelling was cold and non-painful. A routine blood profile was done to assess the health of the animal. Survey radiographs of skull lateral, ventro-dorsal and thorax lateral were done to rule out any bony involvement and cardio-pulmonary status which revealed no abnormalities. Fine needle aspiration was done to assess the nature of the exudate wherein neutrophilic infiltration was observed which confirmed the diagnosis as salivary mucocele. Surgical excision of salivary mucocele was performed and en bloc resection of the affected glands, both submandibular and sublingual gland. A drain tube was placed in order to facilitate drainage. Post-operative antibiotics were continued for one week. Periodic surgical wound dressing were done on alternate days. No evidence of recurrence of salivary mucocele was observed and the animal had an uneventful recovery without any complications.

**Keywords:** Submandibular swelling, salivary mucocele, excision, dog

### Introduction

Diseases of the salivary glands are rare in small animals, mucocele is the most common clinically recognized disease of these structures in the dog, and the incidence of occurrence has been reported as fewer than 20 in 4000 dogs [1]. The inciting cause of a salivary mucocele in most cases is usually unknown although blunt trauma, salivary gland or duct foreign bodies, sialoliths, and dirofilariasis have been reported [2]. Clinically, a salivary mucocele is observed as an abnormal swelling containing saliva observed in the cranial cervical or intermandibular, sublingual, or pharyngeal tissues. The nomenclatures are therefore described as cervical, sublingual, or pharyngeal mucoceles with abnormal collections of saliva. However, zygomatic mucocele are very rare form characterised by collection of saliva ventral to the globe [3]. Dogs are more commonly affected than cats and although all breeds are susceptible, there are reports indicating that poodles, German shepherds, dachshunds, and Australian silky terriers are frequently affected [4].

### Materials and Methods

A six years old non descriptive intact male dog weighing 19 kg was brought to Madras Veterinary Teaching Hospital at small animal surgery outpatient unit with a history of progressive submandibular swelling for the past ten days following a dog bite. On clinical examination soft fluctuating, cold, non-painful soft contoured mass was palpable on the right submandibular region. Mild respiratory distress and dyspnoea were also observed. Survey radiographs of skull lateral, ventro-dorsal and thorax lateral were done to rule out any bony involvement and cardio-pulmonary status which revealed absence of bony involvement and normal cardiac and pulmonary silhouette. Ultrasonographic evaluation revealed a hypoechoic region with a more echogenic border indicating a fluid filled cavity surrounded by a well-defined thick border. Based on the history and clinical findings, cervical mucocele was suspected. Aspiration of the mass under aseptic conditions was performed and a thick mucoid, yellow blood tinged fluid which reacted positively with periodic acid schiff (PAS) stain confirmed the presence of saliva and a diagnosis of mucocele. Hematobiochemical profile revealed neutrophilia and slight increase in ALP which might be due to secondary bacterial

infection. Appropriate supportive therapy was provided through anti-inflammatory and antibiotics to counter further infection. Since the animal was unresponsive for the conservative therapy, surgical intervention excision of the salivary cyst with affected gland was planned.

The animal was premedicated with diazepam (@ 0.25mg/kg) and butorphanol (@ 0.2mg/kg) intravenous respectively. Anaesthesia was induced with propofol (@3mg/kg) intravenous following which intubation was performed with cuffed endotracheal tube with internal diameter of 6.0mm. Anaesthesia was maintained under Isoflurane 2.5% with oxygen using a closed rebreathing circuit. The animal was placed in dorsal recumbency and the surgical site was prepared aseptically. After incising skin, subcutaneous tissues, and the platysma muscle, the capsule of the mandibular salivary gland was identified (Fig. 1) and incised to expose the gland. Dissection was continued rostrally to include the mandibular duct and closely associated sublingual gland (Fig. 2). After complete removal, the incised muscular and subcutaneous tissues were sutured with absorbable sutures and the skin was routinely closed with nonabsorbable sutures. The mucocele was drained through a stab incision in the most ventrally dependant area (Fig. 3), and approximately 1 litre of fluid was withdrawn. Due to cosmetic reasons, the large pendulous mass was also removed surgically. The animal recovered uneventfully and skin sutures were removed after 10 days. On histopathologic examination, mild atrophy of the excised glands was observed. The mucocele wall consisted of an outer highly vascularised layer of immature connective tissue and an inner zone of loosely arranged fibroblasts. A pleocellular inflammatory reaction was evident in the central area, which also contained much amorphous acidophilic or amphiphilic debris. The inflammatory cells were mainly mononuclear and plasma cells.

### Results and Discussion

The diagnosis of salivary mucocele is based on the history, clinical signs and histopathologic findings. Affected animals are usually presented with soft and fluctuant painless swellings except in the acute phase of the inflammatory response.

Definitive treatment of this condition requires resection of the affected gland/duct complex. Repeated drainage or injection of cauterizing or anti-inflammatory agents will not only fail to eliminate the mucocele but will complicate the surgical procedure because of subsequent abscessation or fibrosis [5]. In the case described in this report, dog bite was the most probable inciting cause. The pressure exerted through the dog bite appeared to have damaged the sublingual and mandibular salivary gland/duct complex leading to gradually increasing accumulation of saliva manifested as cervical mucocele [6]. It has been observed that cervical mucocele is the most common form of this condition. Previous studies have also pointed out that resection of the mandibular and sublingual salivary glands alongside drainage and excision of the redundant tissues is the most definitive treatment of this condition [7] although in a high percentage of cases (42%) drainage alone was employed for treatment of the affected animals which resulted in the recurrence of the condition within the next 48 hours. The basis for nonsurgical treatment of mucocele lies in the belief that mucocele is a true cyst with secretory lining but the fact that it is not a cyst but a reactive encapsulating structure has prompted the surgical removal of the affected salivary gland/duct complex with definitive results [8].

Sialography has been described as a method for the diagnosis of sialoceles [9] but it is technically difficult and in most cases like the present one it is unnecessary and, therefore, not often performed because the diagnosis can generally be accurately made by careful observation and palpation. Salivary mucoceles are not cysts because they lack luminal epithelium and contain granulation tissue lining which originates from inflammatory reaction to free saliva [10]. It has been stated that the histopathologic appearance of salivary mucoceles varies according to their stage of development. In long standing cases, saliva is surrounded by mature dense connective tissue with abundant vessels, and the lumen of the sialocele contains eosinophilic amorphous material and desquamated cells indicating that the process of saliva secretion and mucocele formation is still continuous [11]. These features were also observed in the present case indicating the long standing and chronic nature of the condition in this particular animal.

### Conclusion

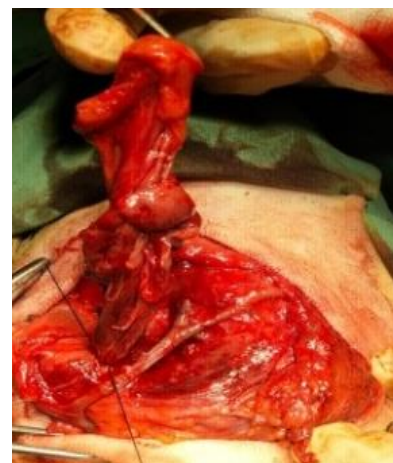
In this present case report described the clinical signs, diagnosis, differential diagnosis and surgical management of salivary mucocele in a nondescript male dog. Prompt presentation, early diagnosis and surgical treatment favours good prognosis.

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**Fig 1:** Cervical mucocele post undermining



**Fig 2:** Sub mandibular and sublingual gland with the cyst- resection followed by ligation



**Fig 3:** Post excision with the drain tube

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