ZYGOMATIC SIALOCELE IN A DOG
Case Report

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SIGNALMENT: Six-year old, white, 15.7 lbs, intact male miniature poodle.

HISTORY: Left orbital swelling and exophthalmos had not responded to one week of therapy with oral cefadroxil[a] and topical pilocarpine.

INITIAL CLINICAL FINDINGS: A general physical examination was normal except for obesity (25% overweight). Disease was confined to the left eye and orbit. There was dorsal temporal displacement of the globe, resistance to retropulsion, exophthalmos and secondary lagophthalmos. The third eyelid was protruded and congested (Fig.1). Schirmer tear test values were 18 OS and 15 OD. Intraocular pressure (Schiotz) was 35.6 mm. Hg. OU (1).

Biomicroscopy revealed a normal anterior segment. There was mild bulbar conjunctival vascular congestion but episcleral vessels were unaffected. The cornea did not take fluorescein stain. The pupils were of equal size; pupillary reflex and menace response were normal. On palpation the lower left lid and ventral orbital area were firmer but not warmer than the right eye.

By indirect ophthalmoscopy the fundus was normal. With the right eye patched the animal navigated a maze; vision of the left eye appeared normal.

Neither opening the mouth nor palpation of the left upper and lower eyelids and orbital area caused discomfort. Examination of the oral cavity and pharynx revealed no sign of neoplasia. Air flow through the nostrils was normal and equal, without stridor or dyspnea.

DIFFERENTIAL CONSIDERATIONS: A space occupying orbital lesion was the probable cause of exophthalmos. The likelihood of neoplasia (2-5) or retrobulbar abscess (cellulitis) (2,6) was considered equal in a 6 year dog. In decreasing probability, other possible causes are zygomatic sialoadenitis with infection (6,9) or mucocele (7,9-11), which may occur separately or in combination. Nasal, paranasal, or frontal sinuses neoplasia (2,3,6,8) or inflammation (2,9) may deform flat bones, causing exophthalmos by swelling or encroachment into orbit space. Cysts in the parenchyma or ducts of the nictitating gland or lacrimal gland (12-16), or neoplastic enlargement of these glands (17) may mimic or cause exophthalmos by displacing the eyelids, third eyelid or globe. Hemorrhage from trauma or orbital fractures may cause exophthalmos (2). Myositis of ocular or temporal muscles (18,2), orbital foreign bodies (2), and parasitism (i.e. dirofilariasis, Pneumonyssoides) all cause orbital swelling (2,19). Dacryocystitis causes swelling near the medial canthus (20). Vascular abnormalities may displace the globe (21,22). Glaucoma was ruled out by lack of signs but buphthalmia (not seen here) may mimic or cause exophthalmos (2).

INITIAL LABORATORY AND ANCILLARY TEST FINDINGS: V/D and lateral radiographs revealed no bony lesions or sinus abnormalities but soft tissue swelling was demonstrated (Fig. 2). CBC and differential were normal except for 13% nucleated RBC's, for which no cause was established. (TABLE I).

The retrobulbar space posterior and ventral to the globe was aspirated under short-acting anesthesia[b]. A 20 ga. needle inserted ventral to the zygomatic arch and lateral canthus was advanced mesiad and slightly dorsad(23). A clear amber thick mucoid substance was aspirated. Bacterial culture was negative; cytology revealed a few PMN and epithelial cells (TABLE I).

INITIAL TREATMENT AND RATIONAL: The tentative diagnosis, based on appearance of the aspirate, was mucocele of the zygomatic salivary gland with dislocation of orbital structures. For palliation of signs, to establish drainage and relieve pressure a small skin incision was made slightly medial to the lateral canthus, just above the ventral orbital rim; material similar to the aspirate exuded out (Fig.3). An attempt to flush mucus with 1:10 Betadine(R)[c] saline solution was unsuccessful. With a small hemostat a Penrose drain[d] was manipulated into the area and sutured in place. A temporary tarsorrhaphy[e] protected the cornea and hot packs were applied to enhance reduction of swelling. In 48 hours swelling was considerably alleviated although moderate resistance to retropulsion remained. Body temperature was normal (100.4°F).

PROGRESS REPORT: Under anesthesia[b,g] the orbit was explored by a modification of described procedures (5,24). A 6 cm. incision extended posteriorly along the ventral border of the zygomatic arch from 1 cm. below the medial canthus to a point 1.5 cm. posterior to the arch. The skin, subcutaneous tissues, and periosteum were dissected free and retracted, exposing the bony arch. The orbital ligament was incised, the anterior arch cut free with an osteotome and the posterior end notched to aid reflection. Tissue adjacent to arch was dissected free, the bone elevated and reflected back to expose the orbital contents (Fig. 4,5). Necrotic zygomatic glandular tissue, discolored fat and tenacious mucus was lateral, ventral and medial to the globe and ocular muscle cone. This material was debrided by dissection, suction, and curettage.

The zygomatic arch was replaced and fixed with two 22 ga. wires through preplaced holes. The orbital ligament was sutured with 2-0 Vicryl(R)[g] also used to close facial fascia, subcutaneous tissue, and skin. A drain exited 1.5 cm. posterior to the lateral canthus (Fig. 6,7). A temporary tarsorrhaphy again protected the cornea with a small opening left at the medial canthus for

treatment with triple ophthalmic ointment[h]. Oral antibiotic[a] was continued for five days. Day one after surgery the animal was stable and ate well; swelling was reduced and exophthalmos gone. By day four all swelling was gone;the drain and tarsorrhaphy sutures were removed. Skin sutures were removed on day ten. By three weeks the eyelids, adnexa and periorbital area were normal (Fig. 8,9). Retropulsion of the globe was normal and painless. A year later the eye remained normal excepting a slight enophthalmos due to removal of fat and glandular tissue, and to postsurgical scarring (Fig. 10).

CLINICAL DIAGNOSIS AND CONFIRMATION: A diagnosis of zygomatic salivary sialocele was based on exophthalmos, lack of radiological evidence of neoplasia, normal hemogram and body temperature, lack of response to antibiotics, and aspiration of sterile, acellular material consistent with a mucocele in the zygomatic gland area. Successful therapy consisted of surgical exposure of the orbit and removal of gland, necrotic tissue and extravasated mucus.

Histopathology proved the tan lobulated material to be salivary gland tissue. Edema, inflammation and degeneration was present along with focal areas of lymphocytic and plasmocytic interstitial infiltrate. In some areas adjacent to glandular tissue there was a band of fibrin, neutrophils, eosinophilic necrotic cellular debris and coagulative necrosis. Only one area had basophilic granular aggregates suggestive of bacteria. Some adipose tissue had moderate lymphocytic, plasmocytic infiltration with macrophages. Occasional immature granulation tissue and adjacent fibrinosuppurative exudate was seen. The pathologic diagnosis was chronic inflammation of the zygomatic salivary gland associated with a salivary mucocele.

DISCUSSION: Neoplasia and retrobulbar cellulitis were equally probable space-occupying lesions in a middle aged animal. Neoplasia occurs more often in older animals while the young more frequently have acute cellulitis or the more chronic form, abscessation. Radiographic signs of neoplasia were absent but soft tissue tumors may be difficult to demonstrate. However, there was no evidence of invasion of bone, nasal turbinate, dental arcade, or oral cavity. Retrobulbar cellulitis or abscess usually respond to antibiotic therapy and possibly surgical drainage unless caused by resistant bacteria. The negative culture of aspirated fluid and lack of inflammatory cells ruled out infection.. Lack of pain on opening the mouth with no erythematous or bulging area posterior to the last molar and the absence of neutrophilia, left shift on CBC and fever also made infection unlikely. There was no evidence of adenitis, cysts or neoplasia of either the gland of the third lid or lacrimal gland. Trauma,

hemorrhage, fracture or neoplasia of orbital bones, parasitism or foreign bodies were ruled out by history, physical exam, radiographs, aspiration, laboratory data, and finally, by surgical exploration.

Glaucoma was ruled out as signs were not consistent (2). While Schiotz tonometer reading and conversion chart suggested elevated intraocular pressure OU it was thought artifactual because of a mismatch of corneal radius of the dog's small globe and the larger radius of the corneal contact surface of the tonometer footplate. Also, the table used (1) has artifactually high values.

Palliation of signs by drainage was attempted as exploration of the orbit was felt to be easier and less traumatic if proptosis was reduced. During this period the cornea was protected by a temporary tarsorrhaphy.

Ultrasonography would have a useful diagnostic procedure for solid or fluid containing orbital lesions (5,25-27). Optic thecography (5,28) can outline the optic nerve and would be helpful in CN III problems but was not used as vision was normal. Computerized tomography is an additional method of examination of orbital contents (29,30) but has been supplanted to a degree by magnetic resonance imaging with the advantage of no radiation exposure and a higher degree of resolution without using contrast media (31). In this case diagnosis was based on finding the mucoid material, and surgical exploration.

Radiological examination of salivary glands by cannulation of the duct and infusion of contrast material will delineate ducts, gland, or extravasation of saliva (31,33,34) but was not needed as other methods were successful.

Based largely on location, salivary mucoceles of the canine neck region were originally considered cysts arising from remnants of brachial clefts (35,36). This theory was later abandoned and they were believed to be benign lymphoendothelial cysts arising from epithelial cells sequestered or originating in lymph nodes rather than from cleft remnants (37). Finally, a study in dogs identified the cysts as having a collagen rather than epithelial wall (37-39); the currently accepted cause is related to a ruptured salivary duct with extravasation of saliva into the tissues. Usually the submandibular or sublingual glands are involved, less often the parotid or zygomatic.

Zygomatic salivary gland diseases are uncommon but not rare and include cellulitis, abscess, neoplasia, and mucocele. They are seen in animals besides the dog; a similar case has been reported in a ferret (40).

Treatment of cervical salivary mucocele is by surgical excision of the involved gland and duct, coupled with cyst drainage (9,38,39). Treatment of

zygomatic sialocele is similar, including surgical exposure and debridement of the gland, necrotic tissue, and trapped secretions (4,6,9-12,37,40).

SUMMARY: A diagnosis of zygomatic sialocele as a space occupying orbital lesion causing exophthalmus was based on clinical signs, laboratory tests, and aspiration of material typical of a mucocele. Surgical exposure facilitated removal of diseased tissue and exudate. Confirmation of diagnosis was by culture, and histopathology. The case had a favorable outcome.

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