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Exophthalmos Secondary to Zygomatic Adenocarcinoma in a Dog

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SUMMARY

An 8-year-old Labrador Retriever developed unilateral exophthalmos over a 1-year period. Contrast radiography, surgical exploration, and histologic examination revealed the cause to be an adenocarcinoma arising from the zygomatic salivary gland or duct.

EXOPHTHALMOS often results from a space-occupying lesion within the orbit and may occur rapidly due to retrobulbar abscessation,[2,4] inflammation of the intraorbital tissues,[2,4] or trauma,[1] or more gradually due to chronic inflammation,[4] cyst formation,[2,3] parasitism,[4,5] arteriovenous fistula,[6] or neoplasia.[1,2,4]

Neoplastic disease is either primary or metastatic and can be confined to the orbit or grow into the orbit from surrounding areas.[1,4,7]

This report concerns an adenocarcinoma of the zygomatic salivary gland or duct, resulting in strabismus and exophthalmos.

Case History

An 8-year-old male Labrador Retriever was referred to the University of Pennsylvania Section of Veterinary Ophthalmology with a history of slow enlargement of the left orbital area of a year's duration. The referring veterinarian had drained serosanguineous fluid from the left orbit several times, with only transient relief.

The exophthalmic left eye was deviated dorsally (Fig 1). With slight pressure on the eyelids, the eye could be proptosed. The affected eye was also somewhat fixed in position, not demonstrating as wide an amplitude of excursion as did the right eye. The left lower eyelid was swollen and a fluctuant mass could be palpated below the lower orbital rim. The nictitating membrane protruded to cover about one-half the palpebral fissure. The upper eyelid, which was distorted due to pressure from the displaced globe, could not be manually returned to its normal position.

Pupillary responses to light were normal in both eyes. Intraocular abnormality was not found in either eye, and both corneas were normal.

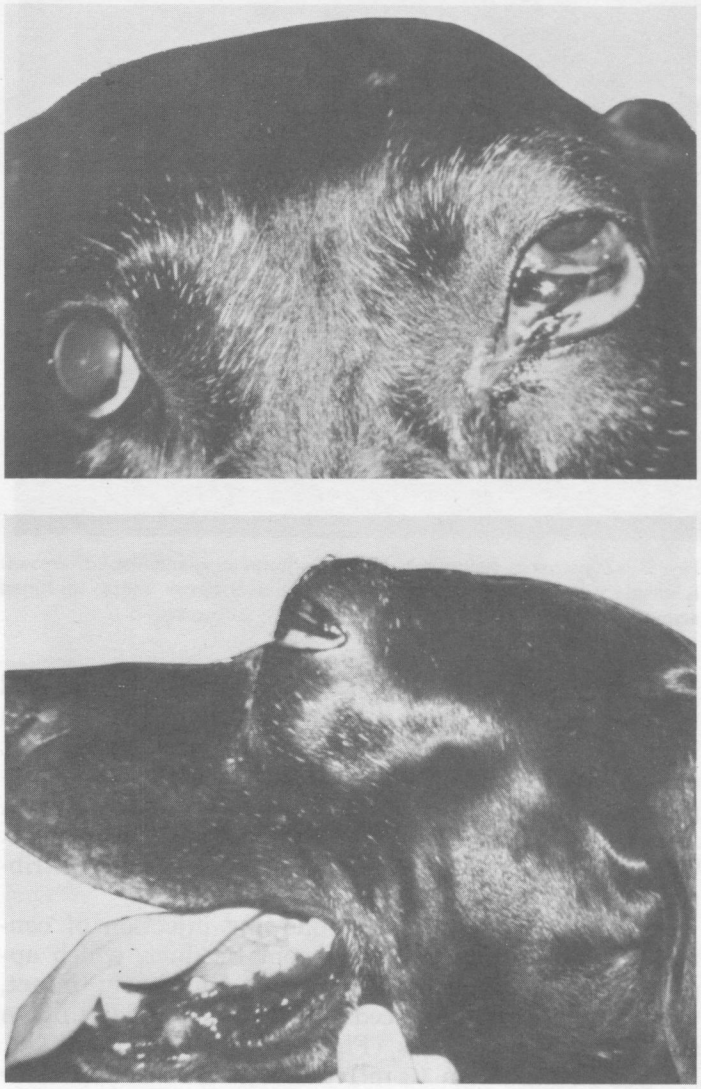

Fig 1—Frontal view (top) of Labrador Retriever with dorsal displacement of the globe, swelling of the inferior orbital tissues, and prolapse of the nictitating membrane. Lateral view of the head (bottom), showing the infraorbital swelling.

Both submandibular lymph nodes were slightly enlarged, the left somewhat more than the right. The dog was obese. The hemogram was normal.

In radiographs of the skull, there appeared to be a cystic expansion of the left maxillary sinus, with thinning of the bone and destruction of the trabeculae within

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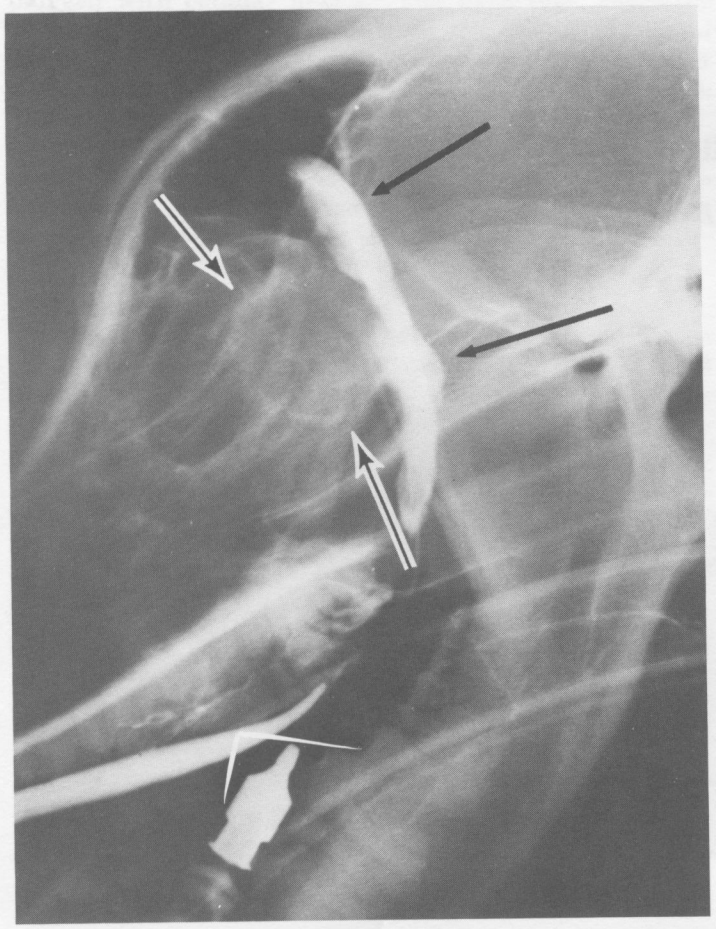


Fig 2—Zygomatic sialograph. The zygomatic gland (solid arrows) is displaced dorsally and caudally by a soft-tissue mass (outlined arrows).

it. The cranial portion of the zygomatic arch appeared to have osteolytic changes. There was evidence of a large soft tissue swelling on the left laterodorsal aspect of the skull, adjacent to the orbit. The initial radiographic diagnosis was tumor of the left maxillary sinus. Abnormalities were not seen on thoracic radiographs. Tomographic examination of the skull was noncontributory.

Radiographs were taken following injection of contrast medium[a] into the left zygomatic duct, which appeared intact. The gland, though apparently intact, was elongated and displaced dorsally and caudally by an adjacent abnormal mass (Fig 2).

Contrast medium (3 ml) was injected into the cyst-like mass. The contrast medium diffused through the mass, extending as far medially as the pterygoid bone (Fig 3), and superimposed over the rostral half of the zygomatic arch.

Following radiographic examination, fluid was withdrawn from the inferior orbital mass via a needle inserted above the zygomatic arch, just posterior to the orbital ligament. The aspirated material appeared mucoserosanguineous. Cytologic examination revealed erythrocytes, histiocytes, and a few leukocytes—principally neutrophils. Mucous strands were also evident. There were no visible bacteria. Because of the few white blood

[a] Renografin-60, E. R. Squibb & Sons, Inc, Princeton, NJ.

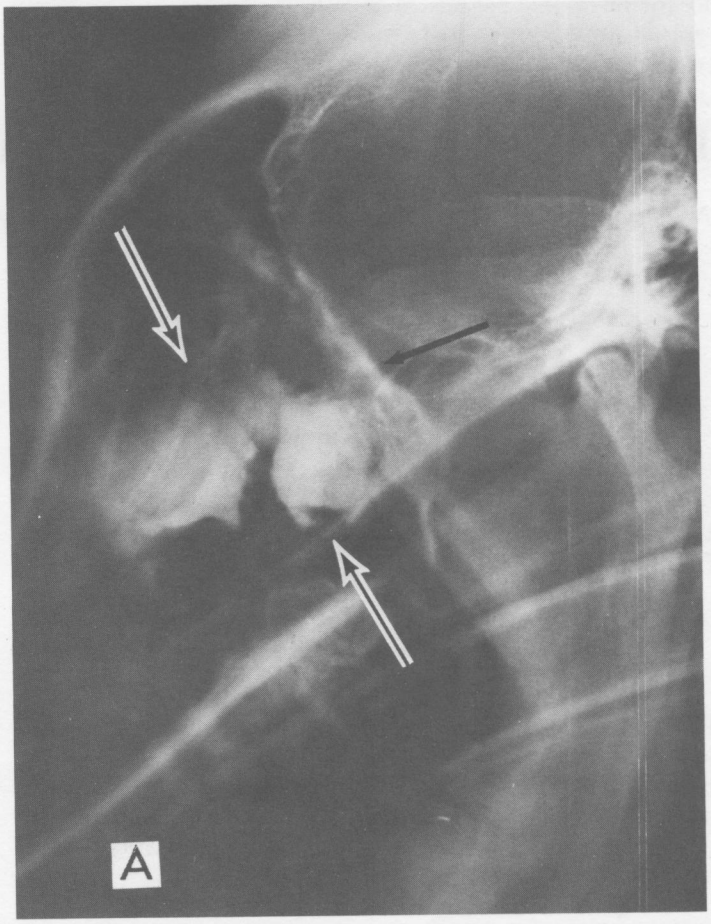
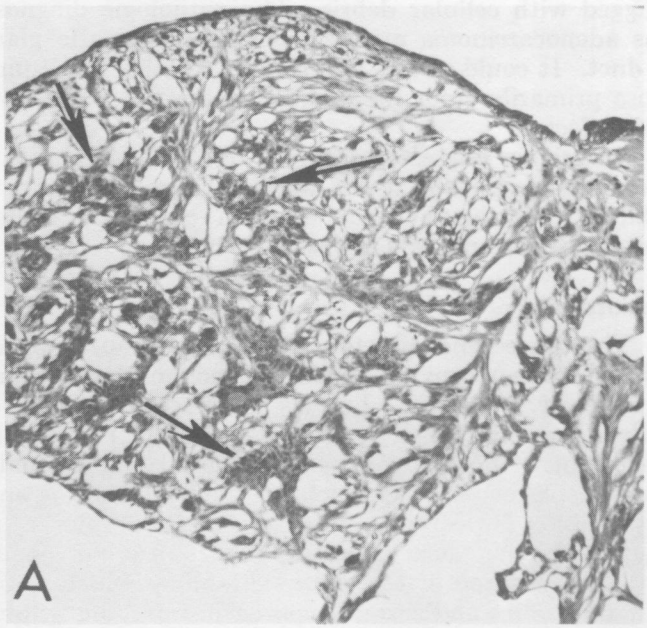


Fig 3A—Lateral radiograph after injection of contrast material into infraorbital mass. Cystic spaces of the mass are filled with contrast medium (outlined arrows). Contrast material remains in the zygomatic gland from the previous sialogram (solid arrow). B—Dorsoventral view of the injected mass, to show horizontal extent.

cells seen and the volume of fluid, the swelling was tentatively diagnosed as a cystic dilatation of one of the ectodermal structures (e.g., salivary gland) or a seroma.

Fig 4—Surgically removed mass, incised to show cystic nature.

Fig 5—Lateral view of involved area 6 days after surgery. The globe has returned to a normal position and the infraorbital swelling is no longer apparent.



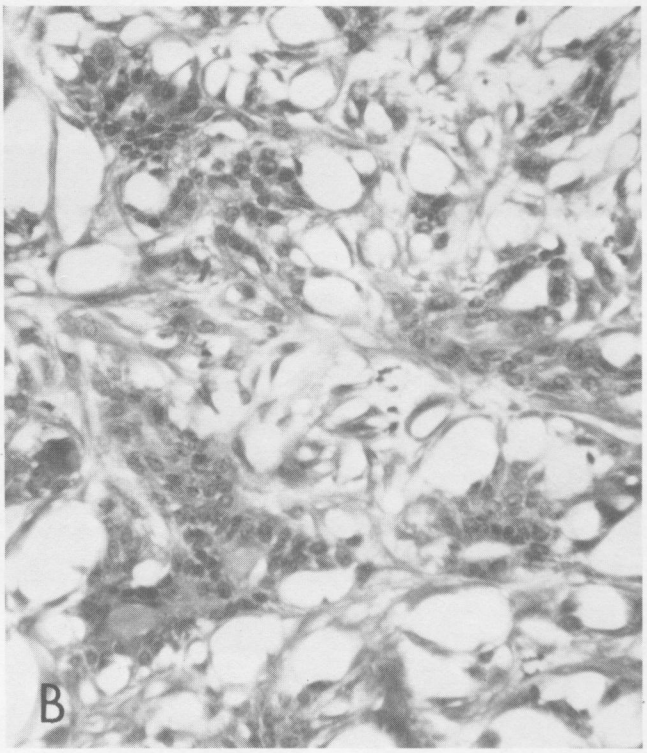


Fig 6A—Low power photomicrograph of a representative area of the tumor mass, showing numerous ductlike spaces and groups of epithelium (arrows). B—Higher magnification of a portion of Figure 6A.

An attempt was made to drain the fluid into the mouth, following removal of the 3rd upper molar. More mucoserosanguineous fluid was obtained. The mass was biopsied through a small incision made dorsal to the zygomatic arch. Histologic examination revealed many inflammatory cells (including large macrophages), vascular endothelial proliferation, and edematous tissue. Neoplastic tissue was not seen.

Three days later, the orbit was explored by making an incision dorsal to the zygomatic arch, transecting the orbital ligament and resecting the dorsal half of the zygomatic arch, following stripping of its periosteum. An intact 6-cm long encapsulated mass, which extended ventrally, medial to the zygomatic arch, was freed from underlying tissue by blunt dissection. The mass contained lobulated tissue and cystic spaces and was attached to the zygomatic salivary gland, which was also removed (Fig 4). A Penrose drain was placed ventral to the zygomatic arch. Recovery was uncomplicated (Fig 5).

On histologic examination, columnar epithelial cells, in some areas papillary in type, were seen proliferating in loose stroma that contained foci of hyalinizing and mineralizing collagen (Fig 6). Some of the epithelium appeared ciliated. There were large areas of necrosis and inflammation; salivary glandlike tissue in the section was inflamed and its ducts were distended and

plugged with cellular debris. The pathologic diagnosis was adenocarcinoma arising from the zygomatic gland or duct. It could not be determined whether the tumor arose primarily from the gland or from the duct; both were affected.

The owner requested that the dog be destroyed. At necropsy, neoplastic tissue was not seen in the periorbital or retrobulbar tissue or in the nasal cavity. Metastatic lesions were not seen.

Discussion

The degree and direction of proptosis caused by an orbital space-occupying lesion depend on the size and location of the lesion. Lesions in the orbital apex or within the extraocular muscle cone cause rostral displacement. Those involving the orbital walls usually cause displacement of the globe to the opposite side and, if the lesion is deep enough in the orbit, proptosis. In many cases the cause of orbital distortion is not apparent. The position of the globe determines which radiographic studies and surgical approaches may be helpful. In the case reported here, the mass was located in the lower orbital region, resulting in dorsal displacement of the globe. Differential diagnosis for space-taking abnormalities in the lower orbit includes abscess and cellulitis, neoplasia or lymphoid tissue or bone, metastatic disease, and enlargement of the zygomatic salivary gland. Surgical exploration and biopsy may be necessary to define the type of abnormality.

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