Nasal Mass in a Golden Retriever

Contributors

Laura Setyo,[1] Katrina Yee-Ka Cheng,[2] Cheryl Sangster,[1] Shannon Donahoe[1]

[1]Veterinary Pathology Diagnostic Services, Sydney School of Veterinary Science, Faculty of Science, University of Sydney, NSW, Australia

[2]University Teaching Veterinary Hospital Sydney, Sydney School of Veterinary Science, Faculty of Science, University of Sydney, NSW, Australia

Signalment

11-year-old male neutered Golden Retriever

Specimens

- Histopathology of an incisional biopsy of a nasal mass
- Impression smear cytology of a nasal mass
- Histopathology of an excisional biopsy of a nasal mass

History

An 11-year-old male neutered Golden Retriever presented for the investigation of a 4-month history of serous to mucoid nasal discharge that had been previously treated with antibiotics. The dog was up-to-date with the usual vaccinations used in Australia, and up-to-date with his worming prevention.

Clinical findings

Clinical examination revealed a lack of airflow through the left nostril and inspiratory dyspnoea. The dog was otherwise well in himself and did not exhibit any other signs of illness.

Diagnostic procedures

Complete blood count, a peripheral blood smear and biochemistry showed no abnormalities. An Immuno-Mycologics Cryptococcal Antigen Lateral Flow Assay was negative for *Cryptococcus* spp.

Computed tomography of the skull and nasal region was performed and revealed a soft tissue mass occupying the entire left nasal cavity, with some crossing into the right cavity as well as crossing the cribriform plate into the cranial vault. These findings were consistent with neoplasia within the nasal cavity. Blind biopsies of the left nasal cavity were performed and submitted for histopathology (Figure 1). Following biopsy interpretation, a diagnosis was reached, and chemotherapy commenced. Unfortunately, due to deterioration of his clinical condition, the dog was euthanised one year later and submitted for postmortem examination.

On postmortem examination, a dark purple-red mass was found to be occupying the left nasal cavity; compressing the nasal septum; causing extensive bony lysis of the left maxilla; and extending into the right nasal cavity, nasopharyngeal meatus, and the sphenoid and left frontal sinuses (Figure 2). Impression smears and histopathology of the mass was performed (Figures 3 to 5).

Figure 1. Histopathology of an incisional biopsy of a nasal mass from an 11-year-old male neutered Golden Retriever. Haematoxylin and eosin stain. x4 magnification (A) and x20 magnification (B).

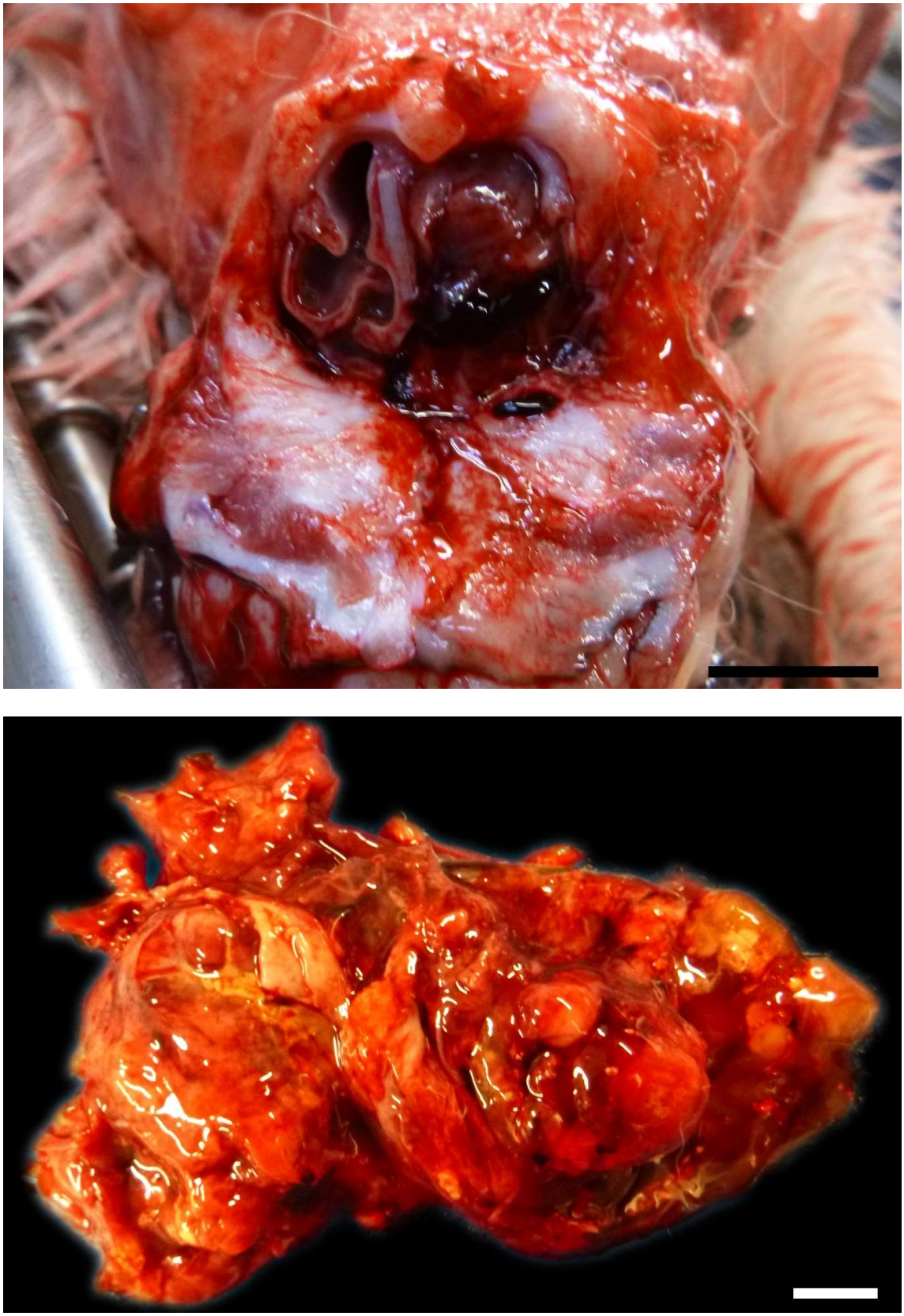

Figure 2. Nasal mass in an 11-year-old male neutered Golden Retriever in situ (A), and ex vivo (B). Bar = 1 cm.

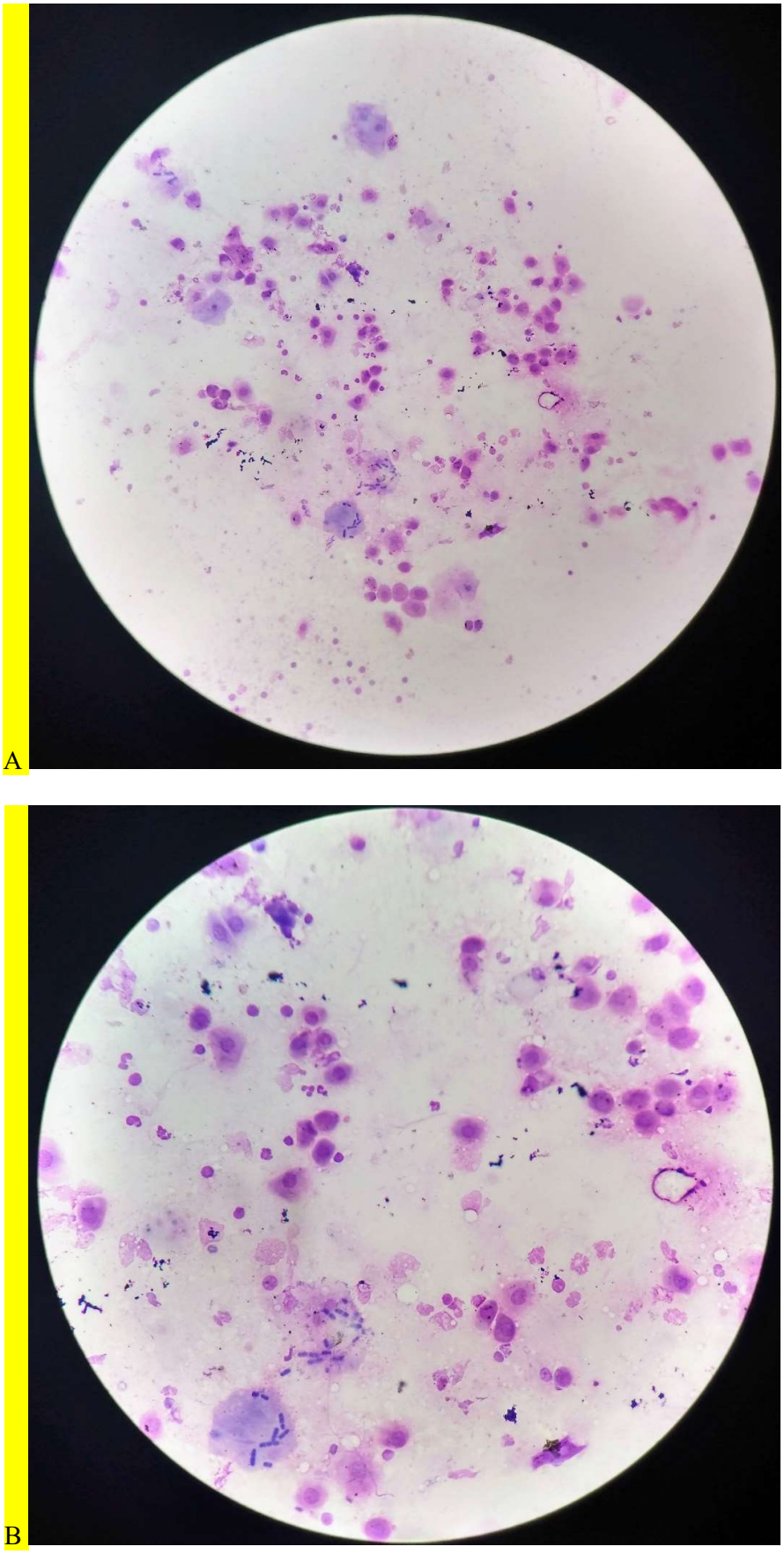

Figure 3. Impression smear cytology of a nasal mass from an 11-year-old male neutered Golden Retriever. Diff-Quik stain. X20 magnification (A) and x40 magnification (B).

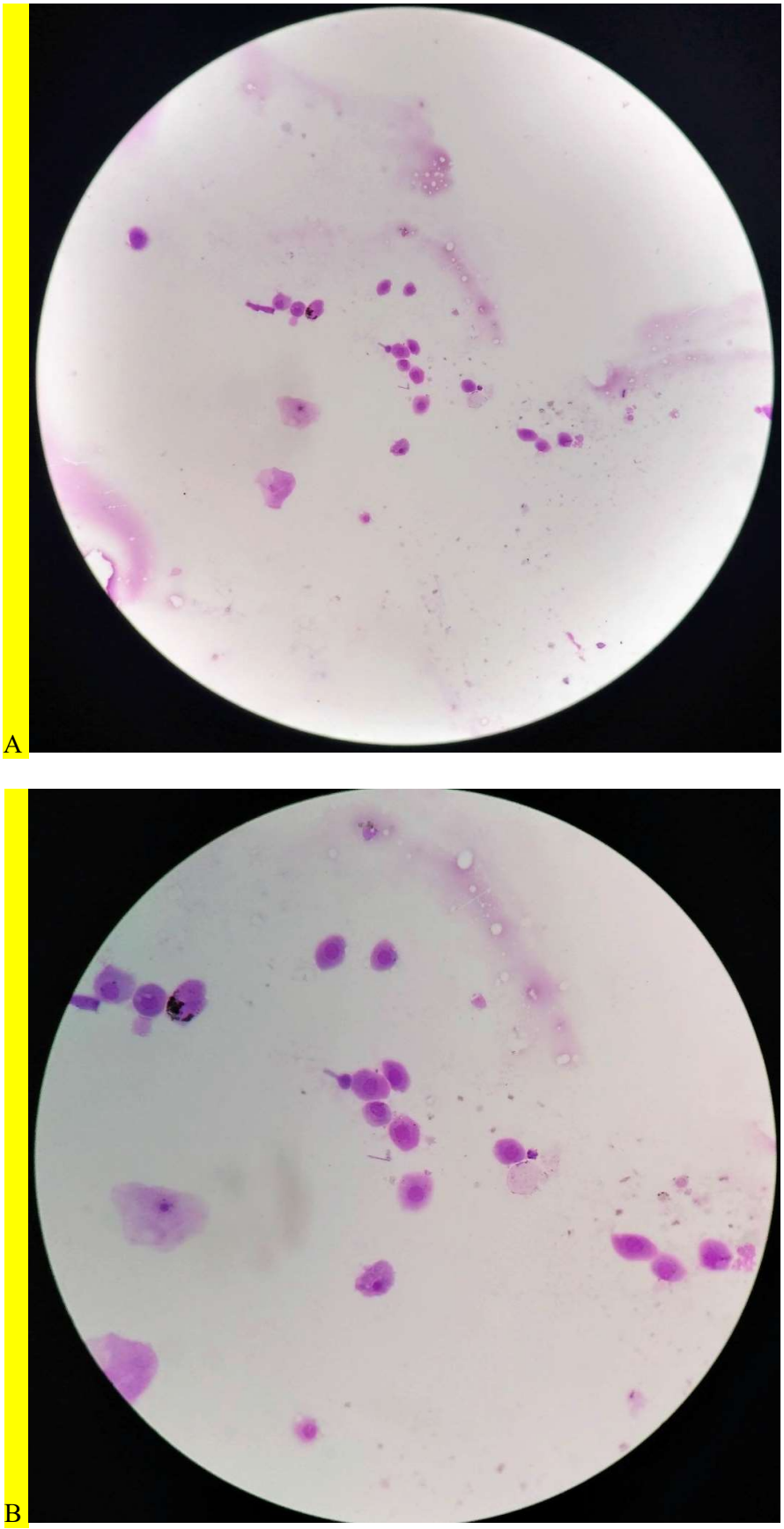

Figure 4. Impression smear cytology of a nasal mass from an 11-year-old male neutered Golden Retriever. Diff-Quik stain. x20 magnification (A) and x40 magnification (B).

Figure 5. Histopathology of an excisional biopsy of a nasal mass from an 11-year-old male neutered Golden Retriever. Haematoxylin and eosin stain. x4 magnification (A) and x20 magnification (B).

Questions

1. What is your description of the cytologic findings?
2. What is your description of the histologic findings?
3. What is your interpretation of the cytology and histologic findings?

Cytology

Description: Examined is one smear stained with Rapi-Diff. The smear is of moderate cellularity with fair preservation and staining. The background is clear to pale pink, with minimal blood contamination and minimal numbers of inflammatory cells. There are many large variably cohesive clusters of atypical epithelial cells. Atypical cells have a high N:C ratio, moderate amounts of basophilic cytoplasm, round to oval nuclei with finely stippled chromatin, and generally one distinct nucleolus. There is minimal anisocytosis and anisokaryosis. Admixed are low numbers of neutrophils, keratin flakes, nucleate and anucleate squames, and clusters of *Simonsiella* bacteria.

Interpretation:

Histopathology

Description: The ciliated nasal epithelium is attenuated. Expanding the submucosa is a densely cellular, expansile, un-encapsulated neoplasm composed of spindle cells arranged in streams, and loosely packed and haphazardly arranged capillaries, supported by a fibrocollagenous stroma admixed with oedema. Capillaries are lined by plump endothelial cells. There is minimal anisocytosis and anisokaryosis. The mitotic rate is less than 1 per ten high power fields. Scattered throughout are occasional lymphocytes, plasma cells, macrophages, neutrophils, and multinucleate giant cells with up to 7 nuclei. There is scattered single cell necrosis.

Morphologic Diagnosis: Nasal angiofibroma

Discussion

Findings were consistent with nasal angiofibroma causing upper respiratory tract obstruction. Nasal angiofibromas are a rare, histologically benign but locally aggressive proliferation of vascular elements in dogs. Histologically, these tumours are characterized by the presence of numerous blood vessels of irregular size and shape supported by proliferative connective tissue.[1] Within the literature, there exists a single case report in a dog[2] and a case series in 13 dogs.[1] Despite their benign histologic appearance, these neoplasms are locally invasive and destructive and should be considered a differential diagnosis in dogs that are diagnosed with destructive nasal tumours. Because of the space-occupying and vascular nature of these

masses, dogs often present with recurrent epistaxis, nasal obstruction and a detectable nasal mass. Therefore, clinical signs caused by nasal angiofibroma are like those produced by malignant nasal tumours. An alternative diagnosis are benign vascular proliferations. These include granulation tissue-type haemangioma, which can occur in the nasal cavity of humans, but reports of these could only be found in the skin and oral cavity of dogs. In addition, nasal angiofibroma differs histologically from these other disease processes.[3]

Dogs diagnosed with nasal angiofibromas have variable survival times; in a case series by Burgess et al. (2011), the longest survival time was 2 years after presentation and commencement of treatment with corticosteroids.[1] In that case, the tumour was found to extend into the cranial vault, corticosteroids were used to reduce clinical signs associated with the disease and there was no further treatment. Euthanasia was elected due to progressive neurologic signs, including ataxia. Alternative treatment methods include surgery, which appears to be generally well-tolerated, and radiation therapy. A common complication of surgery to remove these tumours in human and canine patients is excessive haemorrhage due to the vascularity of these masses. This is managed with repeat blood transfusions and the use of pre-operative angiographic embolization in humans[4]. In humans, these treatment methods are reported to have cure rates as high as 80%.[5] Radiation therapy is worthwhile considering in veterinary patients as these animals often present with advanced disease in which complete surgical resection is not a viable option.

Conclusion

In conclusion, nasal angiofibroma is a rare and unusual tumour of dogs with a similar case presentation to other destructive nasal tumours. This case highlights the usefulness of cytology and histology in the diagnosis of nasal tumours, and the importance of having nasal angiofibroma as a differential diagnosis in dogs that present with clinical signs suggestive of a malignant nasal tumour.

Acknowledgements

The authors would like to thank Elaine Chew and the Veterinary Pathology Diagnostic Services Histology Department at the University of Sydney, and Katherine Walker and the Veterinary Pathology Centre at the University of Surrey, for providing invaluable technical assistance.

References

1. Burgess, K.E., et al., *Angiofibroma of the nasal cavity in 13 dogs.* Veterinary and Comparative Oncology, 2011. **9**(4): p. 304-309.
2. Miller, R.M., *Angiofibroma in the frontal sinus of a dog.* Vet Med Small Anim Clin, 1968. **63**(8): p. 772-3.
3. Kim, Y., S. Reinecke, and D.E. Malarkey, *Cutaneous angiomatosis in a young dog.* Vet Pathol, 2005. **42**(3): p. 378-81.
4. Neel, H.B., 3rd, et al., *Juvenile angiofibroma. Review of 120 cases.* Am J Surg, 1973. **126**(4): p. 547-56.
5. Cummings, B.J., et al., *Primary radiation therapy for juvenile nasopharyngeal angiofibroma.* Laryngoscope, 1984. **94**(12 Pt 1): p. 1599-605.