Oral Fibrosarcoma in the Horse

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Introduction:

Fibrosarcomas are malignant connective tissue tumors which are considered to be rare, with occurrence being as little as three percent of neoplasms reported in the equine patient.[2] Previously reported fibrosarcoma locations in horses include the head, prepuce, mammary gland, kidneys, omentum, oropharynx, and the nasomaxillary sinuses.[1,2] The head seems to be the most common location for soft tissue sarcomas in this species.[1] The focus of this paper is more particularly focused on oral fibrosarcoma in the horse with regards to history/presentation, pathophysiology, differentials, diagnostic approach, treatment methods, and prognosis/outcome.

History and Presentation:

Oral tumors may be identified on routine oral exam or during dental care before any symptoms/clinical signs appear. However, many of them may not be noticed until secondary clinical signs occur such as ptyalism, halitosis, tongue protrusion, quidding, difficulty eating/dysphagia, inappetance, and weight loss.[5,10] Tumors may be observed as swellings in the areas of the mandible or maxillae or as obvious masses within the mouth.[8] Fibrosarcomas are typically firm, fleshy lesions but can vary in appearance.[12] Patient age tends to vary depending on the tumor type, with fibroma and ossifying fibroma reported more in younger animals (less than seven years old, more commonly less than two years old), but these may rarely evolve into fibrosarcomas over time.[5] Fibrosarcomas are usually noted in more mature animals.[5] Oral fibromas and ossifying fibromas have been noted most commonly around the mandible, with fibrosarcomas focused around the mandible or maxillae.[5] There is not enough case evidence to note a sex or breed predilection with equine oral fibrosarcomas.

Pathophysiology (Including Anatomical Considerations):

Tumors are typically defined by their tissue of origin and malignancy.[8] Fibrosarcomas are malignant mesenchymal tumors with fibroblast as the predominant cell type.[12] Fibrosarcomas tend to have higher cellularity and pleomorphism with a higher mitotic index than the two previously mentioned tumor types.[5] Although they are defined as malignant, fibrosarcomas are more likely to be locally invasive than to metastasize, with a metastasis rate estimated at about 10% in dogs.[12] The most common site of metastasis when it does occur is the lungs, with lymph nodes less likely.[2] When located in the oral cavity, invasion into the bones such as the mandible or maxillae is possible. Fibrosarcomas are known to have a high rate of recurrence, especially when clean margins are not obtained during removal.[5]

Differential Diagnoses:

There are many differentials for an oral mass in a horse, most of which are some type of neoplasia including soft tissue tumors such as squamous cell carcinoma, melanoma, and lymphosarcoma, bone tumors such as osteosarcoma and ossifying fibroma, and dental (odontogenic) tumors such as ameloblastomas and ameloblastic odontomas.[10] Squamous cell carcinoma is the most reported neoplasm in the horse, and approximately 7% of all of those squamous cell carcinoma cases are an oral version.[1,7,9] These are slow-growing, but highly aggressive, infiltrative, destructive tumors that are typically multi-lobed and often ulcerated.[7,9] Oral squamous cell carcinoma tends to metastasize to the lymph nodes.[7,9]

There is also a periosteal fibrosarcoma that originates from the connective tissue surface of the bone which can be hard to differentiate from an oral soft tissue fibrosarcoma that is advanced to the point where it invades the bone.[11] The periosteal fibrosarcoma is typically filled with well-differentiated cells and collagenous stroma, with little pleomorphism and hyperchromasia and few mitotic figures.[11] This description often leads to an underdiagnosis of

fibroma or scar tissue when advanced imaging and clinical history are not associated with the biopsy results.[11]

Non-neoplastic differentials for an oral mass include gingival hyperplasia or epulis due to chronic inflammation from dental disease, exuberant granulation tissue due to some form of traumatic injury, bony callous due to a fracture, abscess formation, salivary mucocele, cyst, reactive cementoma and amyloidosis.[10]

Diagnostic Approach/Considerations:

Biopsy with histopathologic examination is the main way to definitively diagnosis an oral mass. Radiographs may help to determine if there is any bony involvement such as lysis, proliferation, fracture, or callous formation. Computed tomography can be used to better determine exact margins of the mass and the degree of infiltration. Thoracic radiographs may be beneficial to determine if there may be metastasis of a tumor to the lungs. Lymph node aspirates/biopsy may be beneficial to determine if there is metastasis to the lymph nodes, though this is less likely with fibrosarcoma. CBC, serum chemisty, and urinalysis may also be beneficial as a general checkup before considering surgery.

Treatment and Management Options:

Surgical excision of the mass with clean margins is considered the best treatment option when possible for fibrosarcoma. Current literature suggests horses can do well with maxillectomy and mandibulectomy procedures with minimal loss of function.[4] In particular for mandibulectomies, attempting to leave part of the mandibular symphysis intact and possibly adding internal or external stabilization is recommended, but a horse has continued to do well even without stability of the hemimandibles.[6] Placing a soaker catheter within the surgery site

along with using other analgesics can help reduce immediate post-op discomfort to help the patient return to normal function more quickly.[3] Changes in feeding habits may be necessary to allow proper healing of the surgery site and proper prehension for the animal. Flushing out the mouth occasionally may help avoid impactions of food due to the decreased functionality in prehension and chewing.[1]

These masses tend to be less responsive to radiation than some other tumor types, but success has been reported.[2,10] Finding a hospital that will do radiotherapy can be difficult and impractical.[5] Local chemotherapeutic agents such as 5-fluorouracil and cisplatin beads have had some success as well with equine fibrosarcoma and may be beneficial as the main therapy or adjunct therapy with surgical excision.[2] Systemic chemotherapy with surgery may be an option as well.[2]

Expected Outcome/Prognosis:

As mentioned previously, recurrence is common with fibrosarcoma, causing a poor prognosis for resolution.[10] With clean surgical excision, chance of recurrence is decreased but is still common.[12] With the infiltrative nature of fibrosarcomas, clean margins can sometimes be hard or impossible to obtain. Adjunctive therapy with chemotherapeutics and/or radiotherapy may be necessary to help decrease recurrence.[12] If metastasis has occurred, the prognosis is more guarded. Mean survival times and time to recurrence for oral fibrosarcomas in the horse have not been documented. Since recurrence is common, regular oral examinations are recommended to ensure the absence of new masses. If recurrence and surgical complications are avoided and the ability to eat without difficulty is maintained, the prognosis for the patient is good.

References:

1. Carmalt J., Linn K. “Large Segmental Mandibulectomy for Treatment of an Undifferentiated Sarcoma in a Horse” Veterinary Surgery 2013; 42:433-439.

2. Roels S. et al. “Successful Treatment of an Equine Preputial Fibrosarcoma Using 5-Fluorouracil/Evaluation of the Treatment Using Quantitative PCNA and KI67 (MIB 1) Immunostaining” Journal of Veterinary Medicine Series A 1998; 45:591-598.

3. Minghella E., Auckburally A. “A preventive multimodal analgesic strategy for bilateral rostral mandibulectomy in a horse” Equine Veterinary Education 2014; 26(2):66-71.

4. Witte S. “Maxillectomy and mandibulectomy in the horse: Indications and necessity of post operative adjunct therapy” Equine Veterinary Education 2014; 26(5):274-279.

5. Lechartier A. et al. “Resection of the incisive bone and rostral maxillae for removal of an ossifying fibroma in an 18-year-old Warmblood gelding” Equine Veterinary Education 2015; 27(11):574-578.

6. Mendez-Angulo J. et al. “Extensive Rostral Mandibulectomy for Treatment of Ameloblastoma in a Horse” Veterinary Surgery 2014; 43:222-226.

7. Monteiro S. et al. “Mandibular squamous cell carcinoma in a young horse” Equine Veterinary Education 2009; 21(8):406-410.

8. Tremaine W. H. “Oral Cavity Neoplasia” American Association of Equine Practicioners Focus Meeting 2006 in Indianapolis, IN, USA.

9. Schuh J. C. L. “Squamous Cell Carcinoma of the Oral, Pharyngeal and Nasal Mucosa in the Horse” Veterinary Pathology 1986; 23:205-207.

10. Gerard M. "Chapter 77: Oral Cavity Masses" In: Robinson N., Sprayberry K. Current Therapy in Equine Medicine 6th ed. USA: Saunders Elsevier, 2009; 348-350.

11. Moulton J. Tumors in Domestic Animals 2nd ed London, England: University of California Press, 1978; 17-18, 141-142.

12. Villalobos A. The Merck Veterinary Manual website. Connective Tissue Tumors. Available at: http://www.merckvetmanual.com/mvm/integumentary_system/tumors_of_the_skin_and_soft_tissues/connective_tissue_tumors.html Accessed July 1, 2016.