

Bighorn Sheep Sinus Tumors, an Update

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ABSTRACT In 2009, bighorn sheep sinus tumors were discovered within a herd of seven Rocky Mountain bighorn ewes in Colorado, USA that were culled due to a history of at least 10 years of failed lamb recruitment. Since discovery, at least 38 cases of sinus tumors have been identified in at least 10 free ranging bighorn herds in Colorado. Additional cases have been identified in Rocky Mountain bighorns from Wyoming, Nevada, and Nebraska, as well as one herd of desert bighorn sheep in California, and one herd of California bighorn sheep in Nevada. The disease has been shown to be infectious experimentally and likely has moved across the landscape through natural and artificial movements of bighorn sheep. Although sinus tumors alone do not appear to affect adult survival or lamb recruitment, sinus tumors in combination with other typical respiratory pathogens have been consistently identified in Colorado bighorn herds that are struggling with dismal lamb recruitment. Theoretically, sinus tumors may affect the susceptibility of adult bighorns to pneumonia through interference with normal clearance mechanisms of the upper respiratory tract. We provide the illustration below to alert biologists, managers, or others who may have access to bighorn sheep skulls or horn, to the possible presence of skull and sinus tumors.

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KEYWORDS co-infections, infectious, solid mass, tumor, upper respiratory sinuses

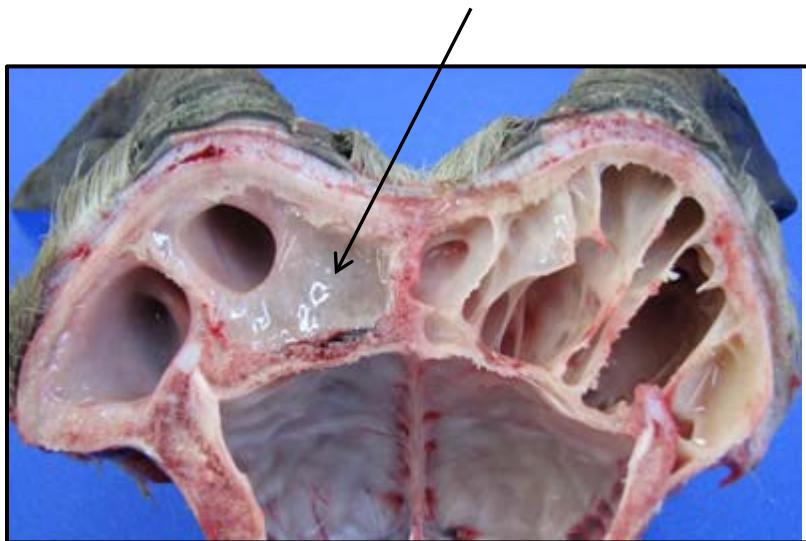


Figure 1. Tumor formed in the right-side of the forehead (contrast the sinus occluded by the tumor, left side arrow, with sinus free of tumor, right side).

LITERATURE CITED

- Fox, K. A., S. K. Wootton, A. J. Marolf, N. M. Rouse, I. K. LeVan, T. R. Spraker, M. W. Miller, and S. L. Quackenbush. 2016. Experimental transmission of bighorn sheep sinus tumors to bighorn sheep (*Ovis canadensis canadensis*) and domestic sheep. *Veterinary Pathology* 53(6):1164-1171.
- Fox, K. A., N. M. Rouse, K. P. Huyvaert, K. A. Griffin, H. J. Killion, J. J. Gaines, W. H. Edwards, S. L. Quackenbush, and M. W. Miller. 2015. Bighorn sheep sinus tumors are associated with co-infections by potentially pathogenic bacteria in the upper respiratory tract. *Journal of Wildlife Diseases* 51(1):19-27.
- Fox, K. A., S. K. Wootton, S. L. Quackenbush, L. L. Wolfe, I. K. LeVan, M. W. Miller, and T. R. Spraker. 2011. Paranasal sinus masses of rocky mountain bighorn sheep (*Ovis canadensis canadensis*). *Veterinary Pathology* 48(3):706-12.