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# Ameloblastic fibroma in an alpine chamois (*Rupicapra rupicapra*)

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## ABSTRACT

Spontaneous odontogenic tumors are neoplasms characterized by a mixed odontogenic ectomesenchymal and odontogenic epithelial origin; they are rare in both humans and animals. A 3-year-old male Alpine

Chamois (

*Rupicapra rupicapra*

) was found dead in north-west Italy, and was referred for the necropsy to the Department of Veterinary Sciences of the University of Turin (Italy). At the external examination a

10

×

8 cm, exophytic, red-pink, smooth, firm and ulcerated mass was observed on the inferior lip. Histologically the tumor was characterized by spindle shaped cells arranged in bundles in an abundant hyaline

matrix. Multifocal and rare chords of odontogenic epithelium mixed with rare melanocytes that pene-

trate the neoplasia were visible. Immunohistochemistry showed a clear cytokeratin positivity of epithelial

clusters. Macroscopical, histological and immunohistochemical findings were consistent with a diagno-

sis of locally infiltrative ameloblastic fibroma. To our best knowledge, this is the first report of this tumor

in a wild ungulate and in Alpine Chamois

Spontaneous odontogenic tumors are rare in humans (

Takeda, 1999

)

and in animals (

Gardner, 1996

) but are considered the most common

neoplasms of the oral cavity in cattle (

Meuten, 2002; Walsh

et al., 1987

). These tumors have also been reported in dogs (

Miles

et al., 2011; Nold et al., 1984

), horses (

Peter et al., 1968; Roberts et al.,

1978

), nonhuman primates (

Baskin and Hubbard, 1980

), sheep

(

Dubielzig and Griffith, 1982

) and an anaplastic sarcoma of the man-

dible in a llama has been diagnosed (

Malone et al., 1996

). Recently an

ameloblastic fibroma has been reported in a rhesus macaque (

Macaca

mulatta

)(

Liu et al., 2012

).

This is a rare neoplasm of mixed odontogenic ectomesenchymal

and odontogenic epithelial origin (

Cohen and Bhattacharyya, 2004;

Miles et al., 2011

). It occurs more often in the mandible than in the

maxilla, with a predilection for the posterior area of the jaws, and

is seen as a mass-like lesion interfering with mastication (

Gardner,

1996; Meuten, 2002

). Histopathology refers of epithelial compo-

nents usually in strands and islands, often consisting of cuboidal

or columnar cells, with a large amount of a connective tissue com-

ponent, much more cellular than in the ameloblastoma. The degree

of cellularity varies within the same tumor, and between tumors

(

Takeda, 1999

). It can be differentiated from ameloblastic fibro-

odontoma by lack of dentin or enamel (

Meuten, 2002

). Aim of this

work is to describe the first case, to our best knowledge, of this tumor

in a wild ruminant species.

A 3-year-old male Alpine Chamois (

*Rupicapra rupicapra*

)was

found dead in Piedmont, Turin Province, north-west Italy due to

polytrauma for a road accident, and was referred for the necropsy

to the Department of Veterinary Sciences of the University of Turin

(Italy). At the external examination a 10

×

8 cm, exophytic, red-

pink, smooth, firm and ulcerated mass was observed on the inferior

lip. The mass involved the rostral part of the jaw to the diastema.

The incisor teeth were visible laterally and within the mass (

Fig. 1a

and b

). At cut the surface of the neoformation appeared white with a narrow base, suggesting a neoplasm. Other findings were hemothorax and hemoperitoneum due to the trauma, and diffuse, white, firm nodules in the lungs. The mass and samples of lungs were fixed in 10% neutral buffered formalin (pH7) and paraffin-embedded for histological and immunohistochemical examinations. Four-micrometer sections were stained with hematoxylin and eosin (HE). Additional sections of the mass were collected on poly-L-lysine-coated slides and processed for immunohistochemistry using the standard avidin–biotin–peroxidase complex method and diaminobenzidine as chromogen detection (Dako) with hematoxylin counterstain. As primary antibody a monoclonal mouse anti-human cytokeratin (Dako, 1:100) clone MNF116 was used, and cattle epithelial tissue was used as a control.

Histologically the tumor, not capsulated and not well demarcated, appeared to infiltrate the chorion; it was characterized by spindle shaped cells arranged in bundles in an abundant hyaline matrix. Neoplastic cells had indistinct cells borders, a small amount of eosinophilic cytoplasm, and spindle shaped nuclei with finely stippled chromatin. Mitotic figures average 0–1/400

×

fields. Mul-

tifocal and rare chords of odontogenic epithelium were visible throughout the mass (

Fig. 1c

). Rare melanocytes penetrated the

neoplasia without conferring macroscopical pigmentation to the neoplastic tissue, as already reported by

Thurley (1985)

. The mucosa

showed multifocal and severe erosions, and a severe inflammatory infiltrate of neutrophils, lymphocytes and plasma cells.

Immunohistochemistry showed a clear cytokeratin positivity of epithelial clusters (

Fig. 1d

).

Lung samples showed the presence of parasites, allowing the diagnosis of parasitic pneumonia.

In the WHO histological classification of odontogenic tumors

(

Head et al., 2003

), tumors of the odontogenic epithelium with an

odontogenic mesenchyme are categorized into five types. These tumors can be locally invasive, but rarely metastasize (

Gorlin et al.,

1961; Step et al., 2003

). In this classification, ameloblastic fibroma

is defined as a tumor whose structure includes both the epithelial and mesenchymal components, whereas ameloblastic fibro-odontoma additionally contains deposition of the dentin matrix or enamel matrix (

Tanaka and Sawamoto, 2013

). There is one malig-

nant case report of an odontogenic tumor in a dog that metastasized

to multiple distal organs (

Ueki et al., 2004

). However, no distinc-

tion between benign and malignant tumor has been made in this

classification (

Tanaka and Sawamoto, 2013

).

Dentinoid (hard tissue) formation was not present in the entire

mass, and therefore we diagnosed this tumor as an ameloblastic

fibroma, ruling out ameloblastic fibro-odontoma.

In humans and cattle, ameloblastic fibromas are benign, slow-

growing, expansile, noninvasive neoplasms (

Gardner, 1992; Kumar

Dutta, 2009

) that do not tend to infiltrate the bone (

Cohen and

Bhattacharyya, 2004

). The typical clinical presentation in humans

is jaw swelling, mainly of the caudal mandible, or intraoral swell-

ing (

Cohen and Bhattacharyya, 2004; Mosby et al., 1998;

Pitak-Arnnop et al., 2009; Vasconcelos et al., 2009

). In about 75%

of cases, the tumor is associated with an impacted tooth (

Cohen and

Bhattacharyya, 2004; Philipsen et al., 1997; Regezi et al., 2008

) and

it may be accompanied by ulceration, pain, tenderness, and drain-



age (

Miles et al., 2011

).

On contrary to other ameloblastic fibromas reported in ruminants that are firm, lobulated, roughly spherical masses with intratumoral cysts (

Cheema and Shannin, 1974; Miles et al., 2011;

Sastry et al., 1967; Simu et al., 1975; Step et al., 2003

), in our case

no macroscopical or histological cysts were detected.

Locally infiltrative ameloblastic fibroma was the final diagnosis for this tumor according to its location, the histopathological coexistence of both neoplastic epithelial and mesenchymal components with absence of dental hard tissue and no mature collagen formation, a low neoplastic cellular proliferative activity, and the immunohistochemical findings. Other differential diagnosis (i.e. actinobacillosis, foreign body granuloma, non odontogenic tumors, and squamous cell carcinoma) were excluded.

To our best knowledge, this is the first report of this tumor in a wild ungulate and in Alpine Chamois.

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#### References

Baskin, G.B., Hubbard, G.B., 1980. Ameloblastic odontoma in a baboon (*Papio anubis*).

Veterinary Pathology 17, 100–102.

- Cheema, A.H., Shannin, H., 1974. Congenital ameloblastoma in a calf. *Veterinary Pathology* 11, 235–239.
- Cohen, D.M., Bhattacharyya, I., 2004. Ameloblastic fibroma, ameloblastic fibro-odontoma, and odontoma. *Oral & Maxillofacial Surgery Clinics of North America* 16, 375–384.
- Dubielzig, R.R., Griffith, J.W., 1982. An odontoameloblastoma in an adult sheep. *Veterinary Pathology* 19, 318–320.
- Gardner, D.G., 1992. An orderly approach to the study of odontogenic tumours in animals. *Journal of Comparative Pathology* 107, 427–438.
- Gardner, D.G., 1996. Ameloblastic fibromas and related tumors in cattle. *Journal of Oral Pathology & Medicine* 25, 119–124.
- Gorlin, R.J., Chaudhry, A.P., Pindborg, J.J., 1961. Odontogenic tumors, classification, histopathology, and clinical behavior in man and domesticated animals. *Cancer* 14, 73–101.
- Head, K.W., Cullen, J.M., Dubielzig, R.R., Else, R.W., Misdorp, W., Patnaik, A.K., et al., 2003. *Histological Classification of Tumors of the Alimentary System of Domestic Animals. Second Series.* WHO Armed Forces Institute of Pathology, Washington, DC.
- Kumar Dutta, H., 2009. Jaw and gum tumours in children. *Pediatric Surgery International* 25, 781–784.
- Liu, D.X., Doyle, L.A., Bouljihad, M.T., Didier, P.J., Gilbert, M.H., Wang, X., et al., 2012. Locally infiltrative ameloblastic fibroma in a rhesus macaque (*Macaca mulatta*) with characterizations of its proliferating activity and biological behavior. *Journal of Veterinary Diagnostic Investigation* 24, 630–635.
- Malone, E., Roertgen, K., Kobluk, C., 1996. Anaplastic sarcoma of the mandible in a llama. *Canadian Veterinary Journal* 37, 426–428.

- Meuten, D.J. (Ed.), 2002. Tumors in Domestic Animals. Iowa State Press, Ames. 788 pp.
- Miles, C.R., Bell, C.M., Pinkerton, M.E., Soukup, J.W., 2011. Maxillary ameloblastic fibroma in a dog. *Veterinary Pathology* 48, 823–826.
- Mosby, E.L., Russell, D., Noren, S., Barker, B.F., 1998. Ameloblastic fibroma in a 7-week-old infant: a case report and review of the literature. *Journal of Oral and Maxillofacial Surgery* 56, 368–372.
- Nold, J.B., Powers, B.E., Eden, E.L., McChesney, A.E., 1984. Ameloblastic odontoma in a dog. *Journal of American Veterinary Medical Association* 185, 996–998.
- Peter, C.P., Myers, V.S., Ramsey, F.K., 1968. Ameloblastic odontoma in a pony. *American Journal of Veterinary Research* 29, 1495–1498.
- Philipsen, H.P., Reichart, P.A., Praetorius, F., 1997. Mixed odontogenic tumours and odontomas: considerations on interrelationship. Review of the literature and presentation of 134 new cases of odontomas. *Oral Oncology* 33, 86–99.
- Pitak-Arnnop, P., Chaine, A., Dhanuthai, K., Bertrand, J.C., Bertolus, C., 2009. Extensive ameloblastic fibroma in an adolescent patient: a case report with a follow-up of 4 years. *European Journal of Dentistry* 3, 224–228.
- Regezi, J.A., Sciubba, J.J., Jordan, R.C., 2008. Odontogenic tumors. In: Regezi, J.A., Sciubba, J.J., Jordan, R.C. (Eds.), *Oral Pathology: Clinical Pathologic Correlations*, fifth ed. Saunders, St. Louis, MO, pp. 277–279.
- Roberts, M.C., Groenendyk, S., Kelly, W.R., 1978. Ameloblastic odontoma in a foal. *Equine Veterinary Journal* 10, 91–93.
- Sastry, G.A., Venkatanarayana, J., Rao, P.R., Christopher, J., 1967. Adamantinomas in bovine: a report of two cases. *Indian Journal of Animal Science* 42, 281–283.
- Simu, G., Ivascu, I., Simu, G., 1975. A bovine ameloblastic tumour with peculiar stromal pattern suggesting a preodontogenic ameloblastoma. *Zentralblatt für Veterinärmedizin Series A* 22, 791–796.
- Step, D.L., Ritchey, J.W., Drost, W.T., Bahr, R.J., 2003. Ameloblastic odontoma in the mandible of a llama. *Canadian Veterinary Journal* 44, 824–827.
- Takeda, Y., 1999. Ameloblastic fibroma and related lesions: current pathologic concept. *Oral Oncology* 35, 535–540.
- Tanaka, M., Sawamoto, O., 2013. Spontaneous ameloblastic fibroma in a young Guinea pig. *Journal of Toxicologic Pathology* 26, 325–328.
- Thurley, D.C., 1985. Development, growth and eruption of permanent incisor teeth

in Romney sheep. *Research in Veterinary Science* 39, 127–138.

Ueki, H., Sumi, A., Takaishi, H., Ito, H., Oyamada, T., Yoshikawa, H., 2004. Malignant ameloblastic fibro-odontoma in a dog. *Veterinary Pathology* 41, 183–185.

Vasconcelos, B.C., Andrade, E.S., Rocha, N.S., Morais, H.H., Carvalho, R.W., 2009. Treatment of large ameloblastic fibroma: a case report. *Journal of Oral Science* 51, 293–296.

Walsh, K.M., Denholm, L.J., Cooper, B.J., 1987. Epithelial odontogenic tumours in domestic animals. *Journal of Comparative Pathology* 97, 503–521