

Retrospective study of spindle cell tumour in the face of cats



S. Soto*, S. Blatter*, C. Krudewig†, M. Steck‡, S. Hobi§, N. Kühn¶, M. Ruetten±, N. Ignatenko∞ and S. RüfenachtΔ

*Institute of Animal Pathology, Vetsuisse Faculty, University of Bern, Bern, CH, †Institute of Veterinary Pathology and ‡Virology Institute, Vetsuisse Faculty, University of Zürich, Zürich, CH, §Department of Veterinary Clinical Sciences, Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong, Hong Kong, HK, ¶Kühn Pathologie, Hünenberg / Zug, CH, ±PathoVet, Tagelswangen, CH, ∞Tierarztpraxis Feldkirchen, DE and ΔDermaVet, Oberentfelden, CH

UNIVERSITÄT BERN
 Universität Bern | Universität Zürich
 vetsuisse-fakultät

INTRODUCTION: Spindle cell tumours in cats, including suspected feline sarcomas, are rarely examined using immunohistochemistry or tested for bovine papillomavirus. The present study applied these approaches in 31 feline spindle cell tumours of the face.

M&M: FFPE specimens of 31 feline spindle cell tumours affecting the face, 3 presenting as a crusty erosive/ulcerative lesion and the others as nodules, were examined using immunohistochemistry for vimentin, SOX-10, S-100, GFAP, NSE, periaxin, Melan-A, PNL-2, SMA and p63, and PCR for bovine papillomavirus 14 (BPV14).

RESULTS: Summarized in tables 1 and 2.

Table 1. Clinical information of 28 cats presenting tumours on the face

ANIMAL NUMBER	BREED	SEX	AGE	NUM. OF TUMOURS	LOCALIZATION	CLINICAL FEATURES	DEAD / ALIVE
Cat 1	DSH	mc	14y	1	Nasal planum, medial canthus	Erosion, ulceration, crusts	D, natural (other)
Cat 2	Maine Coon	fc	3y	1	Nasal planum, upper lip	Erythema and erosion evolving to nodule	D, euthanasia (tumour)
Cat 3	Crossbreed	mc	12y	1	Nasal planum, upper lip	Ulceration, crusts evolving to mass	D, euthanasia (tumour)
Cat 4	Maine Coon	mc	10y	1	Lower lip	Nodule	D, euthanasia (tumour)
Cat 5	Can. Sphynx	mc	10y	1	Nasal planum and bridge	Nodule	D, unknown
Cat 6	DSH	mc	12y	1	Upper lip	Nodule	D, euthanasia (tumour)
Cat 7	ESH	fnc	Unknown	1	Forehead left	Nodule	Unknown
Cat 8	Crossbreed	mc	13y	1	Upper lip	Nodule	Unknown
Cat 9	ESH	fc	15y	1	Nasal bridge	Nodule	D, euthanasia (tumour)
Cat 10	ESH	mc	14y	2	Left and right cheek	Nodule	D, euthanasia (tumour)
Cat 11	DSH	mc	14y	1	Upper lip	Nodule	D, unknown
Cat 12	DSH	mnc	9y	3	Left eyelids / upper lip / left cheek	Nodule	D, unknown
Cat 13	ESH	fc	15y	1	Lip	Unknown	Unknown
Cat 14	ESH	fc	4.5y	1	Nasal bridge	Nodule	Unknown
Cat 15	ESH	m	Unknown	1	Lip	Nodule	Unknown
Cat 16	DSH	m	12y	1	Lip	Nodule	Unknown
Cat 17	BSH	mc	6y	1	Nasal bridge	Unknown	Unknown
Cat 18	ESH	f	15y	1	Lip	Nodule	Unknown
Cat 19	ESH	fc	16y	1	Lip	Nodule	Unknown
Cat 20	ESH	Unknown	1y	3	Left nostril	Nodule	D, euthanasia (tumour)
Cat 21	ESH	mc	9y	1	Forehead	Nodule	D, euthanasia (tumour)
Cat 22	ESH	mc	2y	1	Upper lip	Nodule	Alive
Cat 23	ESH	mnc	6m	1	Nasal bridge	Nodule	D, unknown
Cat 24	ESH	mc	12y	1	Nose	Nodule	D, euthanasia (other)
Cat 25	BSH	fc	9m	1	Left upper lip	Nodule	Alive
Cat 26	ESH	mc	1y	1	Lip	Nodule	Unknown
Cat 27	DSH	fc	Unknown	1	Lip	Nodule	Unknown
Cat 28	Unknown	Unknown	Unknown	1	Unknown	Unknown	Unknown



Cat 1 (upper left), cat 12 (upper right), cat 2 (down left), cat 6 (down right)

Abbreviations: D, death; DSH, Domestic short hair; ESH, European short hair; BSH, British short hair; m, male; f, female; c, castrated; nc, non-castrated; y, years old; m, months old
 Clarifications: Natural (other), natural death not associated with tumour; Euthanasia (tumour), euthanasia due to tumour; Euthanasia (other), euthanasia not associated with tumour

Table 2. HE-based diagnosis and results of the PCR for bovine papillomavirus 14 and immunohistochemical markers for 31 tumours affecting the face of 28 cats

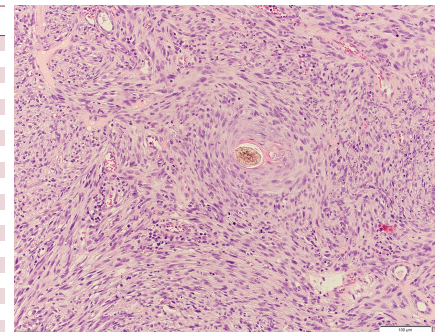
ANIMAL NUMBER	TUMOUR	H&E BASED DIAGNOSIS	HISTO GRADE ¹	BPV14	VIM.	SOX-10	S100	GFAP	NSE	PERIAXIN	MELAN-A	PNL-2	SMA	p63	PRESUMED FINAL DIAGNOSIS
1	1	STS	2	Neg.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
2	2	STS	2	Neg.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
3	3	STS	1	n/i	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
4	4	Feline sarcoïd	2	n/i	Pos.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
5	5	STS	3	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
6	6	STS	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Pos.	PNST
Cat 7	7	Feline sarcoïd	1	Neg.	Pos.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 8	8	STS	1	Neg.	Pos.	Pos.	Pos.	Neg.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 9	9	STS	2	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Pos.	PNST
Cat 10	10	STS	1	Neg.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Pos.	Neg.	PNST
Cat 11	11	STS	1	Neg.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 12	12	Feline sarcoïd	2	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Pos.	PNST
Cat 13	13	Feline sarcoïd	1	Neg.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 14	14	Feline sarcoïd	1	Neg.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 15	15	Feline sarcoïd	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Pos.	Neg.	PNST
Cat 16	16	STS	3	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Pos.	PNST
Cat 17	17	STS	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 18	18	STS	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 19	19	STS	2	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	n/a	Neg.	Neg.	PNST
Cat 20	20	STS	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 21	21	STS	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 22	22	STS	2	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 23	23	Feline sarcoïd	1	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	n/a	Neg.	n/a	Neg.	Neg.	Feline sarcoïd
Cat 24	24	STS	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	PNST
Cat 25	25	Feline sarcoïd	1	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	n/a	Neg.	Neg.	Feline sarcoïd
Cat 26	26	Feline sarcoïd	1	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	n/a	Neg.	Neg.	Feline sarcoïd
Cat 27	27	STS	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	STS
Cat 28	28	Feline sarcoïd	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	STS
Cat 29	29	Feline sarcoïd	1	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	n/a	Neg.	Neg.	Feline sarcoïd
Cat 30	30	STS	1	Neg.	Pos.	Pos.	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Pos.	Lelomyosarcoma
Cat 31	31	Feline sarcoïd	1	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	n/a	Neg.	Neg.	Feline sarcoïd
TOTAL POSITIVE TUMOURS				5	31	22	21	13	7	1	0	0	9	3	

Abbreviations: H&E, Hematoxylin and eosin stain; BPV14, PCR for bovine papillomavirus 14; Vim, vimentin; Neg, negative; Pos, positive; n/i, not interpretable; n/a, not available; STS, soft tissue tumour; PNST, peripheral nerve sheath tumour
 Clarifications: Histo grade, histopathological grading system for cutaneous and subcutaneous soft tissue sarcomas in cats, Dobromylyskij et al. 2021

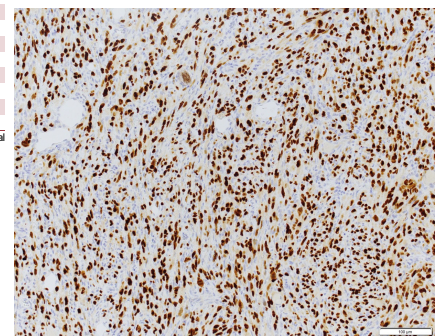
CONCLUSIONS: Our results suggest that feline sarcomas are overdiagnosed based on morphology and other methods are needed for confirmation². Based on immunohistochemical and PCR results the majority of these cases rather resembled peripheral nerve sheath tumours (PNSTs), which seem to be frequent spindle cell tumours in the face in cats. Most of these had in common a strong positivity for SOX-10 and variable positivity for S100, GFAP and NSE. Although SOX-10 is not specific for PNSTs, as melanocytic tumours are also positive^{3,4}, amelanotic melanomas are less likely based on negativity of Melan-A and PNL-2. Interestingly, some of the PNSTs manifested as erosions, ulcerations and/or crusts, indicating substantial clinical importance.

LITERATURE:

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H&E, cat 2: Highly cellular spindle cell tumour with moderate anisocytosis and anisokaryosis. 14 mitoses were counted in 10 HPF. Some lymphocytes and neutrophils are scattered among the neoplastic cells



Immunohistochemistry SOX-10, cat 2: The neoplastic cells display a strong positive nuclear signal