RELATIONSHIP BETWEEN HISTOLOGICAL PARAMETERS, PROLIFERATIVE INDEX AND THE EXPRESSION OF VIMENTIN AND FASCIN-1 IN PAPILLOMAS AND ORAL SQUAMOUS CELL CARCINOMAS IN DOGS

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INTRODUCTION

Epithelial cells can acquire a mesenchymal phenotype as a consequence of the down regulation of epithelial cell hallmarks during the epithelial-to-mesenchymal transition (EMT), generally with expression of vimentin, fibronectin and N-cadherin. Cells undergoing EMT lose epithelial characteristics and acquire mesenchymal features, such as motility. Fascin is a cytoskeleton binding protein associated with cell motility in both normal and neoplastic conditions. The expression. of fascin is low or absent in adult epithelial cells but its overexpression in tumours is associated with poor prognosis. An in vitro study has shown that fascin regulates EMT and invasion in oral squamous cell carcinoma (OSCC) cells. In this retrospective study, the EMT and fascin expression were investigated in samples of canine papillomas and OSCCs.

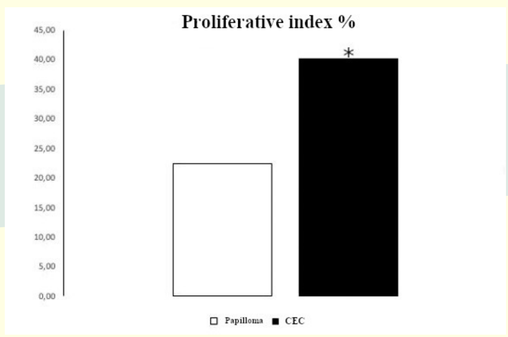
MATERIALS AND METHODS

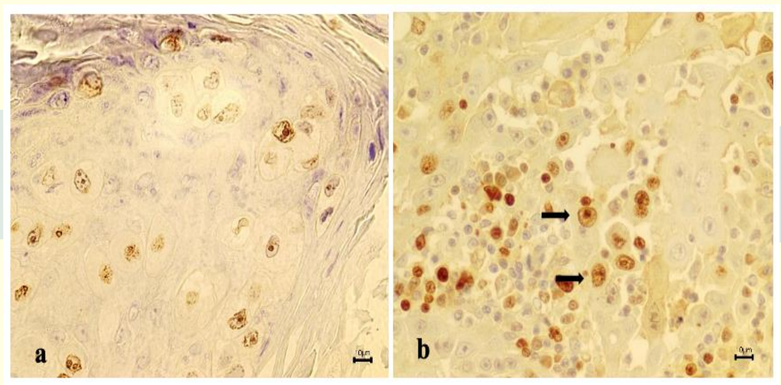
Fifteen canine biopsy samples, diagnosed as papilloma (n=5) and OSCC (n=10) were morphologically analysed. An adaptation of Nagamine et al. (2017) grading system for canine oral SCC (OSCC) was used, following criteria of degree of keratinization, pattern of invasion, host response, nuclear pleomorphism and mitoses per high power field (HPF). All features were assessed, focusing exclusively on the invasive front. Immunohistochemistry was performed, using the MACH1 Universal HRP-Polymer detection system on 4 µm-thick sections of formalin-fixed paraffin-embedded blocks. Monoclonal antibodies to Ki-67(MIB-1), vimentin (V9) and fascin-1 (FSCN/417) were used. For the proliferative index (PI) was considered the count of 500 tumor cells in sites with high immunopositivity (“hot spots”). For the fascin expression assessment qualitative and semi-quantitative methods were used, evaluating the intensity and/or percentage of labeled cells, in 10 fields, with a 40X objective.

RESULTS

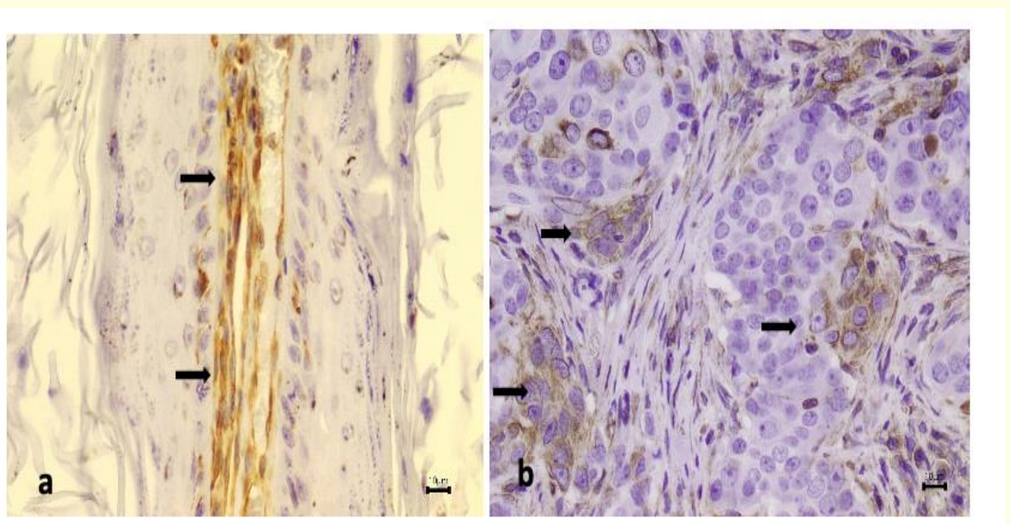
In our samples predominated intermediate grade OSCC (9/10).The proliferative index was higher in malignant lesions (>30%). Vimentin expression occurred in carcinomas, only in invasive neoplastic cells. Fascin-1 expression was identified in both benign and malignant lesions but with greater labelling intensity in the latter. There was an association between high histological grade, elevated proliferative index, and expression of vimentin and fascin-1 in carcinoma cells.

diagnosis	grade	proliferative Index (%)	vimentin	fascin-1
papilloma	-	12,6	-	4
papilloma	-	22	-	4
papilloma	-	26,2	-	5
papilloma	-	22,4	-	5
papilloma	-	38,4	-	4
OSCC	II	38	+	6
OSCC	II	41,6	+	6
OSCC	I	30,1	-	5
OSCC	II	50	-	6
OSCC	II	30,4	+	6
OSCC	II	40.1	-	5
OSCC	II	44	-	5
OSCC	II	44,2	+	3
OSCC	II	42.3	-	5
OSCC	II	40,2	+	5

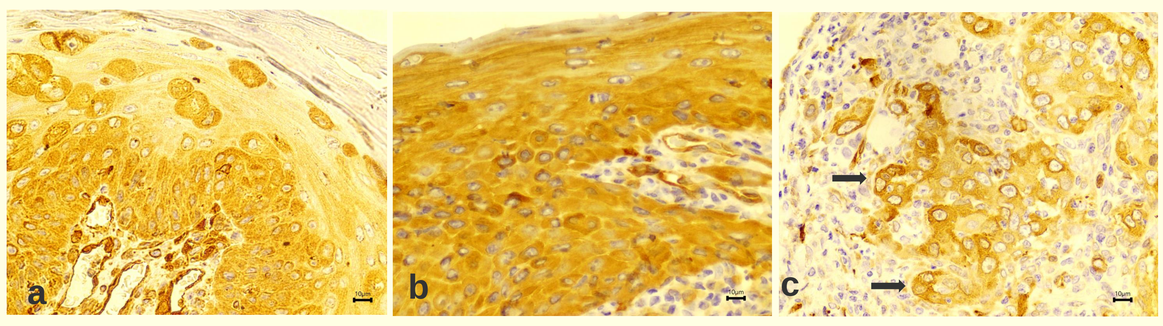




The proliferative index (PI) was measured in papillomatous and carcinomatous lesions.
Ki-67. (a). Papilloma showing nuclear immunopositivity for Ki-67 in keratinocytes along the entire papillary projection. (b). OSCC showing nuclear immunoexpression for Ki-67 in an invasive neoplastic population (arrows).



Vimentin. (a). Papilloma showing positivity for vimentin restricted to dermal stromal components (arrows). (b). OSCC showing important cytosolic expression in invading epithelial cells (arrows).



Fascin-1. (a). Papilloma. Weak to moderate positivity in tumour cells; (b). OSCC. Intense positivity in neoplastic cells. (c) OSCC. Cytosolic expression in invading epithelial cells (arrows).

CONCLUSIONS

These findings suggest that vimentin and fascin-1 are promising prognostic markers for canine oral squamous cell carcinomas.

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