Immunohistochemical Evaluation of Type IV Collagen Alpha Chains in Oral Malignant Melanoma

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Introduction

The basement membrane (BM) is mainly composed of type IV collagen composed of triple combinations of 6 distinct α chains ($\alpha 1$ - $\alpha 6$). Invasive and metastatic melanoma cells form cluster surrounded by BM-like structures. The objective of the study was to determine the immunohistochemical pattern of type IV collagen α chain at the BM-like structures surrounding melanoma clusters.

Materials and methods

Paraffin blocks of human tissues of 1 in situ OMM, 1 invasive OMM, 6 invasive with in situ OMM, 5 metastatic OMM to lymph nodes were sectioned. Type IV collagen α chain specific rat monoclonal antibodies (provided by Dr. Naito and Dr. Sado) were used according to their specific dilutions. AEC chromogen was used to reveal the antigenic sites.

Results

$\alpha 1$, 2, 5 and 6 were constantly detected at the BM of the oral epithelium (Fig.1). $\alpha 1$, 2, 5 and 6 were intermittently detected at

the BM of the oral epithelium in in situ OMM (Fig.2). $\alpha 1$ and 2 were intermittently detected at the BM of the oral epithelium while $\alpha 5$ and 6 were negative in early invasive OMM (Fig.3). In invasive OMM, $\alpha 1$ and 2 were constantly detected at the BM-like structures surrounding nodular nests (Fig.4) and were intermittently detected at the BM-like structures surrounding sheet-like nests (Fig.5). The metastatic melanoma cells likewise formed clusters and $\alpha 1$ and 2 were constantly detected at the BM-like structures surrounding nodular nests (Fig.6) while intermittent in sheet-like nests.

Discussion

The gradual loss of type IV collagen α chains at the BM of the oral epithelium is associated with the progression of OMM. Type IV collagen $\alpha 1$ and 2 are more stable compared to $\alpha 5$ and 6. BMs are dynamic structures that are not only degraded but also deposited around melanoma cell clusters and the distribution pattern of type IV collagen α chains varies depending on the architecture of the nest. These suggest that type IV collagen α chains can be significant markers of oral melanocytic progression.

Fig.1

Fig.1 $\alpha 2$ and 5 were constantly detected at the BM of normal oral epithelium.

Fig.2

Fig.2 $\alpha 2$ and 5 were intermittently detected at the BM of the oral epithelium in in situ melanoma.

Fig.3

Fig.3 $\alpha 2$ was intermittently detected in early invasive melanoma while $\alpha 6$ was negative.

Fig.4

Fig.4 $\alpha 2$ was constantly detected around the nodular nests in invasive melanoma while $\alpha 5$ was negative.

Fig.5

Fig.5 $\alpha 2$ was intermittently detected around sheet-like nests in invasive melanoma while $\alpha 6$ was negative.

Fig.6

Fig.6 $\alpha 2$ was intermittently detected around sheet-like nests in invasive melanoma while $\alpha 6$ was negative.

Table. Summary of IHC of oral epithelium in different OMM and melanoma nests in invasive and metastatic OMM.

Oral epithelium	$\alpha 1$	$\alpha 2$	$\alpha 5$	$\alpha 6$	Melanoma nest	$\alpha 1$	$\alpha 2$	$\alpha 5$	$\alpha 6$
Normal	+	+	+	+	Nodular nest	+	+	-	-
In situ OMM	$\pm$	$\pm$	$\pm$	$\pm$	Sheet-like nest	$\pm$	$\pm$	-	-
Early invasive	$\pm$	$\pm$	-	-					