INTERCELLULAR JUNCTIONS IN THE ATTACHED GINGIVA AND ALVEOLAR MUCOSA IN THE VERVET MONKEY *(CERCOPITHECUS AETHIOPS)*

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Previous studies on loaded attached gingiva (AG) and alveolar mucosa (AM) in the oral cavity of the vervet monkey, have indicated that the different mechanical properties which these tissues have are related to factors such as the keratinization of superficial cells, the length of the epithelial rete pegs and connective tissue papillae and the mode of attachment to the underlying bone. Mechanical loading of these tissues produces different degrees of shortening of rete pegs and connective tissue papillae and flattening of the basal and spinous cells. Tension is generated in the hemidesmosomes at the connective tissue/basal cell interface and the desmosomes in the basal and spinous cell layers[1]. It is not known whether any structural differences exist in the cellular attachments in these two types of tissue.

This study was undertaken to determine the distribution of hemidesmosomes on the basal cell membranes adjacent to the basement lamina and the spinous cell membranes on unloaded keratinized AG and non-keratinized AM.

Specimens of vervet monkey AG and AM were fixed in situ with cacodylate buffered 2.5% glutaraldehyde, excised and processed for examination by transmission electron microscopy. Thirty randomly selected fields containing basal and spinous cells were photographed and printed at standard magnification (28000X). Sectioned basal cell membranes and hemidesmosomes at the connective tissue/basal cell interface and desmosomes between spinous cells were identified on the micrographs (See Figs. 1 and 2) and measured. The percentage of cell membrane occupied by hemidesmosomes, the mean hemidesmosomal length and mean interdesmosomal distance was calculated. The results are detailed in Table 1.

These results suggest that the attached gingiva is better adapted to withstand tension on the basement lamina by having a more extensive cellular attachment than the alveolar mucosa. The intercellular attachment appears to be better developed in the spinous cell layer of the alveolar mucosa which undergoes more stretching than the attached gingiva when it is subjected to a comparable load[2].

References

1. Fleisch, L., Austin, J.C. 1978. J. Prosthet.Dent. 39, 211.
2. Austin, J.C. J. Dent. Res. In Press.

TABLE 1

Hemidesmosomes in attached gingiva (AG) and alveolar mucosa (AM)

		% of plasma membrane occupied by hemidesmosomes	Mean Hemidesmosomal length µm	Mean Interdesmosomal length µm
Basal cell attached to basement lamina	AG	35 ± 13	0,22 ± 0,04	0,35 ± 0,12
	AM	27 ± 6	0,15 ± 0,02	0,36 ± 0,10
Student's t test		p< 0,05	P< 0,01	N.S.
Spinous cells	AG	12 ± 6	0,27 ± 0,06	2,4 ± 1,4
	AM	16 ± 5	0,28 ± 0,05	1,5 ± 0,51
Student's t test		p <0,05	N.S.	p< 0.05

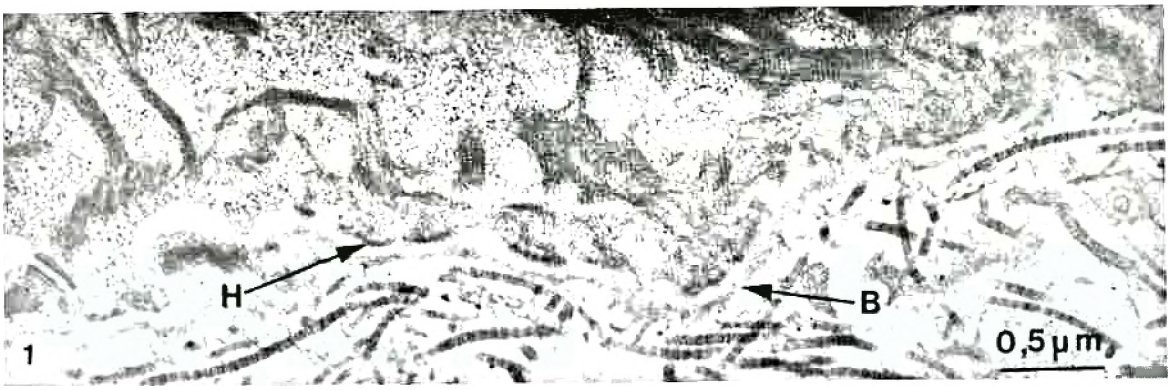

Fig.1. Attached gingiva basement lamina (B) showing hemidesmosomes (H) on basal cells

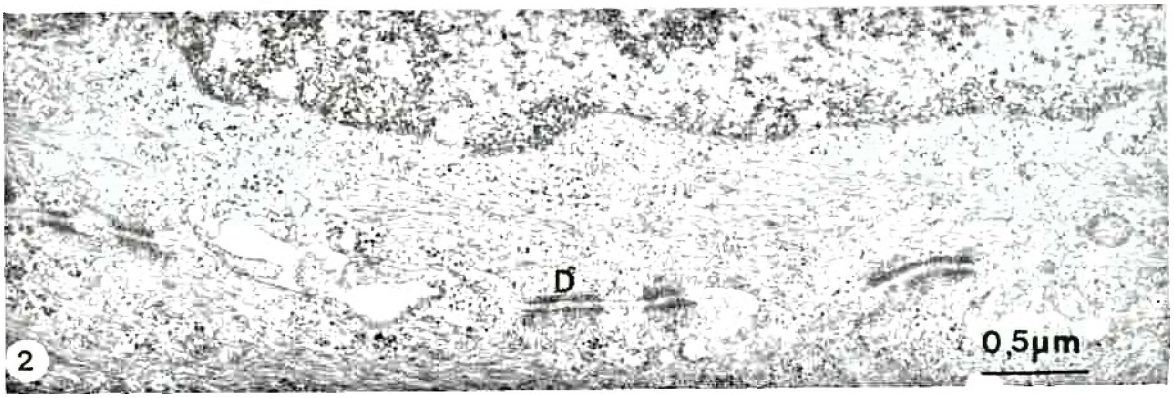

Fig.2. Alveolar mucosa spinous cells showing intercellular desmosomal attachment (D).