ULTRASTRUCTURAL FEATURES OF EXFOLIATING SURFACE CELLS IN KERATINISED AND NON-KERATINISED ORAL MUCOSA

J.C. Austin, E.S. Grossman and P. Cleaton-Jones

MRC/University of the Witwatersrand Dental Research Institute, Johannesburg.

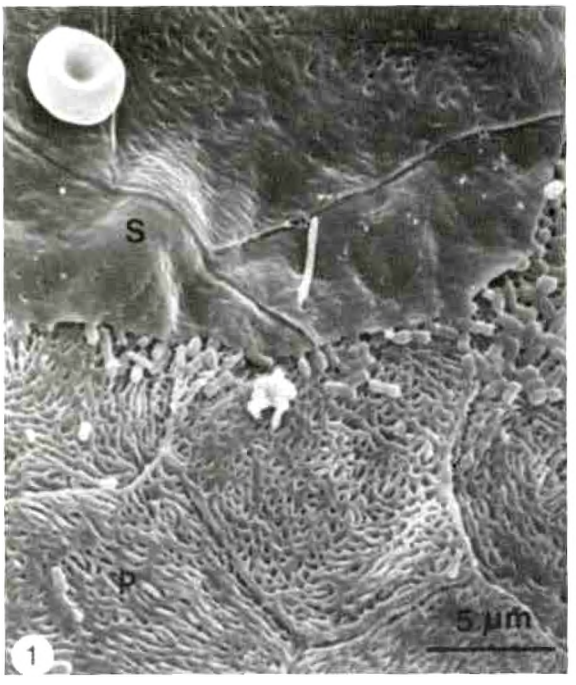
The surface morphology of keratinised and non-keratinised oral epithelium in both animals and man has characteristic features which enable these two types of tissue to be easily identified by scanning electron microscopy (SEM)[1]. Keratinised cells generally have a pitted surface appearance (Fig.1) whilst non-keratinised cells have ridges which form a complex whorled surface pattern (Fig.2). In recent transmission electron microscopy (TEM) studies on keratinised attached gingiva and non-keratinised alveolar mucosa in the vervet monkey *(Cercopithecus pygerythrus)* it was noted that the typical corrugated cell membrane profile was absent from the upper surfaces of exfoliating sectioned cells[2]. The present study was undertaken to examine this phenomenon in more detail.

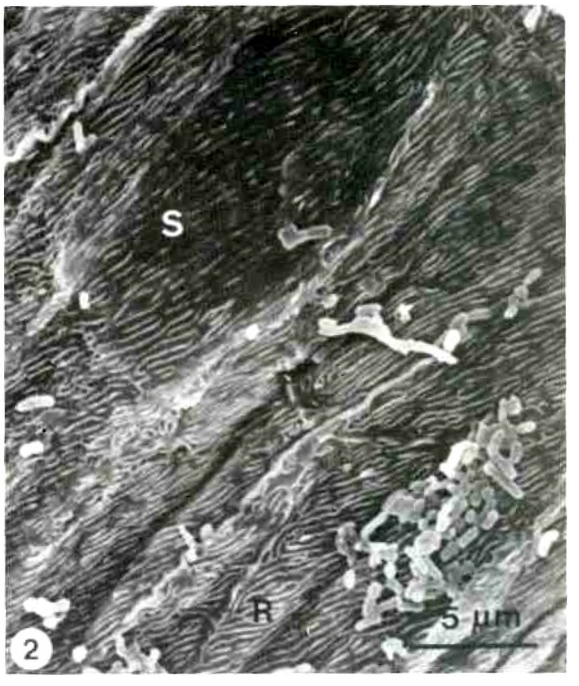
Healthy keratinised and non-keratinised oral mucosa (attached gingiva and alveolar mucosa) were obtained from 6 adult vervet monkeys, fixed in situ by simultaneous perfusion and immersion fixation using cacodylate buffered 2,5% glutaraldehyde and prepared for examination by SEM and TEM.

In both types of epithelium, cells with relatively smooth surfaces were found by SEM adjacent to others with the well defined, typical, pitted or ridged surfaces previously described as characteristic of keratinised and non-keratinised oral epithelium respectively. (Figs. 1 & 2). These features were also found by TEM to be present in the sectioned cell membrane profiles of surface cells of both types of epithelium. The loss of characteristic surface morphology was mainly confined to epithelial cells which were being exfoliated and was more marked in the keratinised cells (Fig.3) than in the non-keratinised cells (Fig.4). These observations suggest that contact with the oral environment results in a progressive flattening of the surface contours in both types of epithelial cells with ageing of the exposed cell surface. Similar surface changes have been noted to occur more extensively in the surface cells of human denture bearing mucosa[3] which suggest that pressure and abrasion may be responsible for the flattening of the upper cell membranes in exfoliating cells.

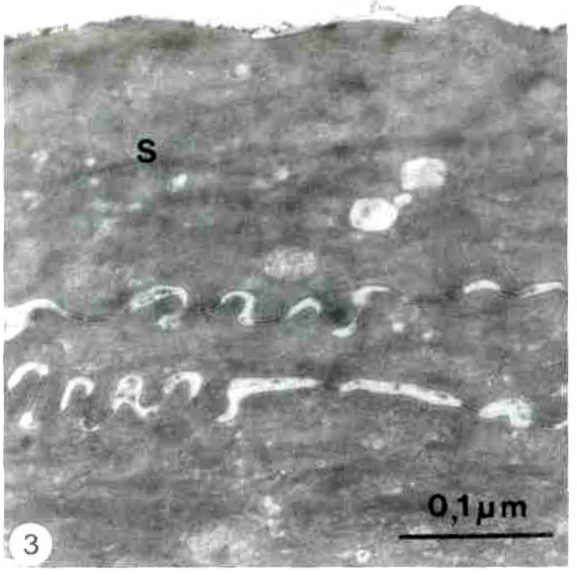
References

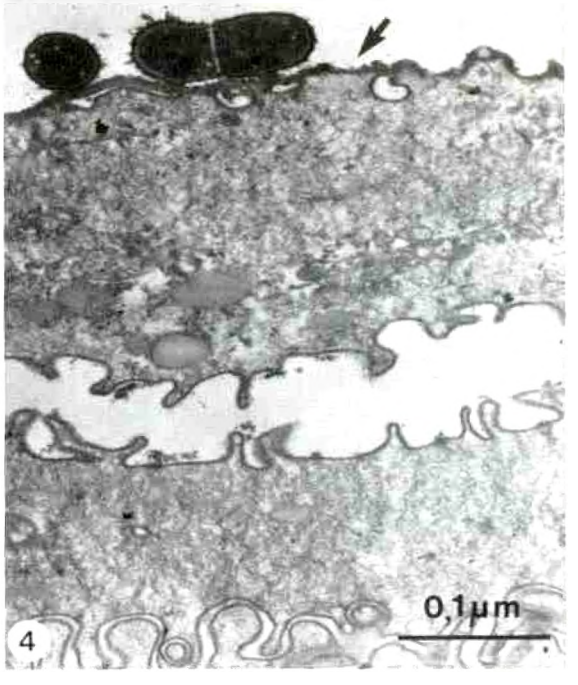
1. Cleaton-Jones, P., Fleisch, L., 1973, J. Periodontal Res.8, 366
2. Austin J.C., Fleisch L., Cleaton-Jones P. 1978, J. Dent. Res. (Abstract in Press).
3. Wilding R.J.C., 1973, J.Dent.Ass.S. Afr. 28, 576.





1. Keratinised and epithelium with pitted (P) and smooth (S) surface cells (SEM).
2. Non-keratinised oral epithelium with ridged (R) and smooth (S) surface cells (SEM).





3. Smooth surfaced superficial keratinised epithelial cell (S) (TEM).
4. Decrease in height of surface ridges (arrowed) in exfoliating non-keratinised epithelial cell (TEM).