Hyaline cells in minor salivary gland tumors —Morphological, immunohistochemical and electron microscopic study—

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Introduction

Hyaline cells (plasmacytoid cells) in the pleomorphic adenoma^{1,2)} and myoepithelioma³⁻⁶⁾ of salivary gland origin have been described. The cells are ovoid or polygonal in shape with a prominent eccentric nucleus and a highly eosinophilic homogenous ground-glass-like cytoplasm. Some myoepitheliomas³⁻⁶⁾ arising in the salivary glands are composed exclusively of hyaline cells.

In this study hyaline cells in 5 cases of neoplasms arising in minor salivary glands were examined by immunohistochemistry and electron microscopy. The purpose of this study was to discuss the nature of hyaline cells.

Materials and Methods

5 cases of benign tumors in the minor salivary glands, containing hyaline cells, were used as materials. The original sites of pleomorphic adenoma were as follows: 3 cases in the palate and one case in the cheek and one case of so-called myoepithelioma was in the palate.

All of these materials were fixed in 10% buffered formalin, embedded in paraffin and the sections were stained with hematoxylin and eosin, alcian blue, mucicarmine, periodic acid Schiff, Mallory's azan and phosphotungstic acid hematoxylin.

For localization of S-100 protein, an immunohistochemical technique using the per-

oxidase-antiperoxidase (PAP) method was applied to each deparaffinized section. Anti-S-100 protein antibody was kindly provided by Dr. T. Nakajima (National Cancer Center Research Institute).

For detection of keratin, a similar technique using PAP method with PAP KIT 518 (DAKO patts) was also performed. To increase antigenicity, the sections were incubated in 0.1% pronase for 15 minutes at 37°C as pretreatment.

For electron microscopic examinations, one case of pleomorphic adenoma and one case of so-called myoepithelioma were used as materials. Each specimen was fixed in 2.5% glutaraldehyde, postfixed in 1.0% osmium tetroxide, dehydrated and embedded in Araldite. Ultra-thin sections were stained with uranyl acetate and lead citrate, and examined under a JEM T-8 electron microscope.

Results and Discussion

The hyaline cells were ovoid or polygonal in shape with eccentric nuclei and homogenous eosinophilic cytoplasm. The similarity between hyaline cells and plasma cells has been described^{2,3)}. However, hyaline cells were much larger and the perinuclear halo was not found in hyaline cells. In some areas hyaline cells formed closely packed sheets or duct-like structures (Fig. 1, 2), while in other areas they were more loosely arranged with myxoid materials.

Fig. 1. High-power view showing islands of hyaline cells with eccentric nuclei and homogenous eosinophilic cytoplasm (HE).

Fig. 2. Medium-power view showing duct-like structure composed of hyaline cells (HE).

Fig. 3. Detection of S-100 protein in an immunoperoxidase reaction using anti-S-100 protein antibody. Positive staining is seen in the nuclei and cytoplasm of hyaline cells (PAP stain).

Fig. 4. Detection of keratin in an immunoperoxidase reaction using PAP KIT 518. Some hyaline cells are strongly positive (PAP stain).

Sciubba and Brannon⁶⁾ have described that hyaline cells were morphologically identical to the plasmacytoid variant of myoepithelial cells.

Immunohistochemistry for S-100 protein demonstrated that some hyaline cells showed strongly positive reaction (Fig. 3). Kahn *et al.*⁷⁾ have reported that positive staining for S-100 protein has been observed in the cartilage-like cells, myoepithelial cells and duct cells in pleomorphic adenomas.

Some hyaline cells were strongly positive for keratin (Fig. 4). In pleomorphic adeno-

mas staining was also positive in the neoplastic epithelial cells of squamous metaplasia and duct-like structures.

Ultrastructurally the nuclei of hyaline cells were relatively hyperchromatic or showed peripheral condensation of chromatin. The nucleoli were sometimes distinct. Numerous fine filaments (chiefly intermediate filaments) were present in the cytoplasm (Fig. 6). Cytoplasmic organelles, such as mitochondria and r-ER, were rarely found. Lipid droplets and pinocytotic vesicles were ob-

Fig. 5 Electron micrograph of hyaline cells with eccentric nuclei and cytoplasm containing numerous fine filaments. Lipid droplets (L), desmosome (arrow) and basement membrane (BM) are seen ($\times 5,600$).

Fig. 6 Electron micrograph of randomly distributed intermediate filaments of hyaline cell ($\times 28,000$).

served in some hyaline cells. Basement membrane was found around some hyaline cells with desmosomes between these cells (Fig. 5).

Buchner *et al.*²⁾ have reported the ultrastructural features of hyaline cells as seen in

our findings.

Based on our findings, it is difficult to determine the origin of hyaline cells. Immunohistochemically, all hyaline cells do not show uniform reaction; some hyaline cells are positive and others are negative for S-100 protein and keratin. The observation that mitochondria and r-ER are rarely found and numerous intermediate filaments are present in the cytoplasm of hyaline cells may suggest that they represent degenerative cells.

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