

## A Possible Error in the Interpretation of Gastric Carcinoma

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Isolated clusters of pyloric cells having homogeneous, eosinophilic (i.e., "glassy") cytoplasm were present in 6 (18.2%) of 33 consecutive gastrectomy specimens. Clusters with "glassy" cells displayed either a glandular arrangement or appeared as cohesive clusters. Cohesive clusters could be misinterpreted as signet-ring cell adenocarcinoma. However, remnants of the apical mucous secretion from the "ordinary" pyloric cells, the nuclei usually near the free border of the cells, as well as the negative reaction in the "glassy" cytoplasm for neutral and acid mucins, helped to differentiate them from signet-ring adenocarcinoma cells.

Key words: Gastric mucosa — "Glassy cell"

Gastric adenocarcinomas are histologically divided into two types: intestinal and diffuse. The former encompass tumors with glandular structures and the latter tumors with signet-ring cells.<sup>1)</sup> While reviewing gastrectomy specimens to assess the distribution of intestinal metaplasia by morphometry<sup>2)</sup> in Japanese subjects we noticed the presence of isolated clusters of cells in pyloric glands which could be misinterpreted as arising in an adenocarcinoma of diffuse type. The possibility of error could be even greater if those cells were to be found in small gastric biopsies.

One thousand nine hundred and seventeen sections from 33 gastrectomy specimens cut into blocks (mean 58.1, range 40 to 121) were reviewed. Twenty-three of 33 specimens contained early gastric cancer: 13 of intestinal type and 10 of diffuse type. The remaining ten specimens had either duodenal or gastric peptic ulcers. The specimens were reviewed at high magnification ( $\times 1000$ ), particular attention being paid to the deeper aspect of the glands in areas with intestinal metaplasia.

Six of the 33 gastrectomy specimens (or 18.2%) contained cells with homogeneous, eosinophilic "glassy" cytoplasm. Three of the specimens had early gastric cancer of intestinal type and the remaining three, early gastric cancer of diffuse type. The cells in question were seen in pyloric glands. Clusters of "glassy" cells usually retained the glandular structure (Fig. 1). In other areas, the cells appeared in cohesive clusters without glandular arrangement (Fig. 2). Some remnants of the cytoplasm corresponding to "ordinary" pyloric cells<sup>3)</sup> were present in some cells (Fig. 1). The nucleus was usually oval or

sometimes round and it was pushed towards the luminal aspect of the cell. The eosinophilic cytoplasm of "glassy" cells was weakly stained with PAS and was negative for Alcian blue pH 2.5, High Iron Diamine, concanavalin A, IgG, IgM, IgA, kappa, lambda, secretory component, Grimelius and Chromogranin.

"Glassy" gastric cells should be differentiated from xanthoma cells, i.e. lipid-laden histiocytes having PAS-negative foamy cytoplasm. Xanthoma cells are found not in the glands but in the lamina propria mucosae. Clusters of xanthoma cells may be confused with gastric carcinoma.<sup>4)</sup> "Glassy" cells also differ from muciphages, i.e., cells having the same configuration as xanthoma cells but with a strongly positive PAS reaction.<sup>5)</sup>

Previously we found cells with eosinophilic "glassy" cytoplasm in only three of more than 500 gastrectomy specimens<sup>5-9)</sup>: one in a Swedish patient having gastric adenocarcinoma, one in a patient from Hawaii having benign gastric ulcer<sup>9)</sup> and the third in a Spanish patient having Ménétrier's disease with microinvasive carcinoma (Rubio and Rivera, unpublished). In those cases only one cluster of "glassy" cells was found. It is therefore noteworthy that cells with eosinophilic, "glassy" cytoplasm have been found in as much as 18.2% of the 33 consecutive specimens herein investigated. Even more surprising was the finding that in two of the six cases "glassy" cells were found in 16% of the 72 sections and in 20% of the 82 sections, respectively.

The cells with "glassy" cytoplasm were present not only in the antrum but also in the body-fundic region. This widespread distribution suggests that these cells may belong to a cell system able to orchestrate some so-far-unknown secretory function. Whatever its function, this cellular system is obviously more often expressed in the

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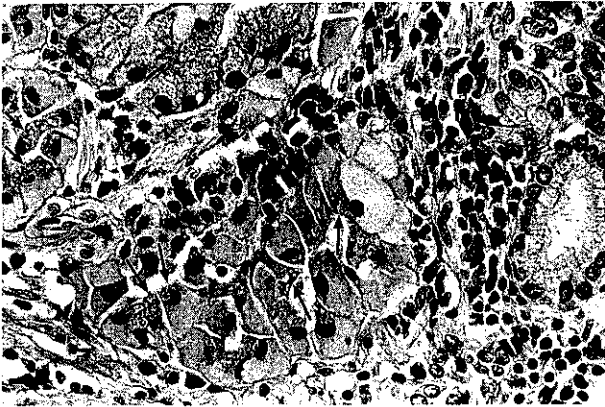


Fig. 1. Pyloric glands with cells having homogeneous, eosinophilic "glassy" cytoplasm. Note the remnant cytoplasm of "ordinary" pyloric cells in the apical aspect of the cells (at arrows). The nuclei in the "glassy" cells are pushed towards the luminal aspect of the glands (H & E  $\times$  600).

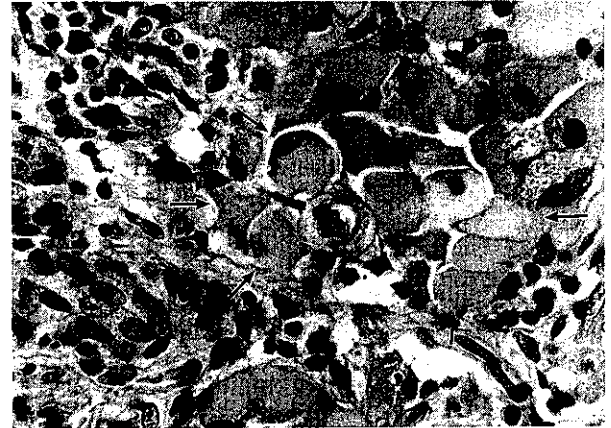


Fig. 2. Cluster of "glassy" cells without glandular arrangement (at arrows) (H & E  $\times$  1000).

gastric mucosa of Japanese patients. Since similar cells had been found in only one of 129 gastrectomy specimens of patients of Japanese ancestry living in Hawaii<sup>9)</sup> it would appear that environmental differences in disparate geographical regions may influence the expression of this eosinophilic "glassy" cytoplasm in gastric cells.

Cohesive clusters without remnant glandular structure may be misinterpreted as signet ring cells adenocarcinoma, particularly if present in small gastric biopsies. However, the presence of the apical remnant of "ordinary" pyloric cells, the nuclear position near the

luminal aspect of the cells, and the negative reaction for neutral and acid mucins are important parameters that help to differentiate "glassy" gastric cells from any of the four types of signet-ring cell adenocarcinoma described in the literature.<sup>10)</sup>

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