Oncocytic Adenocarcinoma of the Stomach: Comparison with Parietal Cell Carcinoma

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Introduction

Primary adenocarcinomas of the stomach are usually divided histologically into diffuse and intestinal types [1]. However, a number of rare histologic variants have been reported, including choriocarcinoma, hepatoid carcinoma, carcinoma with lymphoid stroma (Epstein–Barr virus-related carcinoma), Paneth cell carcinoma [2], neuroendocrine carcinoma, small cell carcinoma, gastric carcinoma with rhabdoid features [3], and parietal cell carcinoma [4]. Among them, hepatoid carcinoma and carcinoma with lymphoid stroma are described elsewhere in this volume (see the chapters by H. Ishikura and J.-M. Chong). Some of these variants have been reported to have a better or worse prognoses than the usual type of adenocarcinoma.

Parietal cell carcinoma of the stomach is very rare, with only 16 cases reported to date [5–11], and is suggested to have a better prognosis than the usual type of gastric adenocarcinoma. It consists of cells with abundant eosinophilic cytoplasm that, on ultrastructural examination, have numerous mitochondria, intracytoplasmic secretory canaliculi, and cytoplasmic tubulovesicles. These histologic and ultrastructural features are considered to be very similar to those of parietal cells in the normal gastric fundic mucosa [7]. The carcinomas in the 16 reported cases showed solid sheets of rather uniform or fusiform cells with only focal glandular structures [5–11]. We have reported a category different from parietal cell carcinoma, although the morphologic features are similar.

We have described 10 well- to moderately differentiated papillotubular adenocarcinomas of the stomach with oncocytic features and compared them with the features of the 16 reported cases of parietal cell carcinoma [12]. Over the last few years we have found 4 more papillotubular adenocarcinomas with oncocytic differentiation; these differed histologically from gastric parietal cell carcinoma cells but were ultrastructurally similar to them and also to normal gastric parietal cells. However, all 14 adenocarcinomas were negative on immunostaining with four different antibodies against H+-K+-ATPase.

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Incidence of Oncocytic Adenocarcinoma Among Gastric Carcinomas in Terms of Patient Age and Sex

In a previous article [12], we described 10 patients (9 male, 1 female) with well- to moderately differentiated tubular or papillotubular adenocarcinoma in which the carcinoma cells had eosinophilic, finely granular cytoplasm. These cases were encountered over an 8-year period (1993–2000) at the Department of Clinical Pathology, Tokyo Metropolitan Geriatric Medical Center, and accounted for 1.8% of a total of 554 gastric carcinomas encountered over this period. In the 2 years (2001–2002) since then, we have newly encountered 4 (2.5%) patients (all male) with gastric oncocytic carcinoma among 162 patients with gastric malignancy, making the overall incidence 14 (2.0%) of 716 patients.

The 14 patients ranged in age from 58 to 84 years (mean, 70.2 years). Four were in their eighties, 5 in their seventies, 4 in their sixties, and 1 in his fifties. Nine of the patients were treated by gastrectomy and the remaining 5, who were considered on the basis of endoscopy and endoscopic ultrasonography to have mucosal carcinomas without metastasis, were treated by laser ablation or endoscopic resection. On the basis of WHO staging, 10 patients (including the 5 treated by laser ablation or endoscopic resection) were in stage IA, 2 were in stage IB, and 2 were in stage IIIA. The 10 stage IA carcinomas were macroscopically type 0-IIa, superficial elevated type (Fig. 1) [13].

Histopathologic Findings

The intramucosal and deeply invasive portions of the 14 carcinomas were always well- to moderately differentiated tubular or papillotubular adenocarcinoma without poorly differentiated or undifferentiated areas (Fig. 2). The carcinoma cells in the mucosal components and superficially invasive portions had finely granular eosinophilic cytoplasm and round nuclei. However, in the deeply invasive portions, the carcinoma cells contained less eosinophilic cytoplasm. The carcinoma cell cytoplasm was relatively abundant. In the mucosa, the cell nuclei occasionally had very prominent nucleoli and intranuclear invaginations of cytoplasm. Cells with irregular, large nuclei with prominent nucleoli were also frequent, especially in the area near the lamina muscularis mucosae (Fig. 3). In the invasive portions, the nuclei had relatively small nucleoli. Therefore, oncocytic features were typically present in the mucosal components with invasive carcinoma or intramucosal carcinoma. Oncocytes have been described as cells with abundant, finely granular eosinophilic cytoplasm that are normally found in the salivary glands [14] and parathyroid glands [14]. Benign oncocytic tumors may arise in the salivary glands, gastrointestinal tract [15], lung, kidney, and other sites. Papotti et al. [15] have suggested the existence of a gastric neoplasm that is rich in mitochondria.

Malignant oncocytomas, although rare, are known to occur occasionally in the salivary glands, thorax, breast, pancreas, and other sites. Both neoplastic and nonneoplastic oncocytes exhibit solid and papillary-tubular architectural patterns and have oxyphilic granular cytoplasm because of the presence of numerous mitochondria in