GRANULAR CELL TUMOR OF THE ESOPHAGUS

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Summary

A case of granular cell tumor of the esophagus in a 50-year-old man is reported. Gastrointestinal endoscopy revealed a round, sessile, non-ulcerated white-yellow elevated tumor at the lower third of the esophagus. Biopsy revealed a granular cell tumor. Immunohistochemical staining demonstrated that granules in the cytoplasm of tumor cells were positive for S-100 protein and negative for carcinoembryonic antigen. An electron microscopic study revealed that tumor cells were closely packed in clusters, surrounded by basal lamina and collagen fibers. Most cells contained dark cytoplasm filled with electron-dense granules. These granules resembled lysosomes and phagosomes. In a few cells with clear cytoplasm, some mitochondria and poorly developed endoplasmic reticulums were seen. Fibrillar internal materials, myelin-like figures and a premature angulate body were observed in the clear cytoplasm. The lesion has remained unchanged in gross appearance and in size for twenty-three months without any treatment.

Key Words: Esophageal submucosal tumor, Gastrointestinal endoscopy, Granular cell myoblastoma, Granular cell tumor, Immunohistochemistry, Ultrastructure.

Introduction

Granular cell tumor, which was first described as "granular cell myoblastoma" by Abrikossoff in 1926, is most commonly encountered in the tongue, skin, and breast. Its occurrence in the esophagus is rare. According to the review by Subramanyam et al. in 1984, seventy-four cases of granular cell tumor of the esophagus have been reported in the world literature since the first report of an autopsy case by Abrikossoff in 1931.

The histogenesis of this tumor is still uncertain, although Abrikossoff believed it was derived from degenerating striated muscle cells. Among many hypotheses, the two main ones suggest a possible origin from Schwann or neural cells and from undifferentiated mesenchymal cells.

This work presents a case of granular cell tumor of the esophagus and describes the endoscopic features, histological and immunohistochemical findings, and results of an ultrastructural study.

Case Report

In December 1983, a 50-year-old man pre-
October 1986  Granular Cell Tumor of the Esophagus  509

Presented with a 6-month history of epigastralgia with lumbago and diarrhea. Although an upper G.I. series did not reveal any abnormality, endoscopic examination with a GIF-P2 (Olympus Co., Tokyo, Japan) demonstrated a round, sessile, elevated tumor measuring approximately 7 mm in diameter in the anterior wall of the esophagus, 38 cm from the upper incisors. The lesion was white-yellow in color and covered with smooth lustrous non-ulcerated mucosa. Three biopsy specimens were fixed in 10% buffered formalin, embedded in paraffin and cut in 3 μm sections. Though repeatedly asked, he denied having ever felt dysphagia, substernal pain or discomfort. Further exploration revealed his complaints were the results of chronic pancreatitis.

Histological examination of sections stained with hematoxylin-eosin showed that the tumor was located beneath the squamous epithelium and possessed a distinct border. Tumor cells were polygonal and arranged in an intertwining strand pattern. The abundant cytoplasm had many eosinophilic granules and the centrally located nuclei were small in size but polymorphic. Occasionally hyperchromatic nuclei were seen. Mitosis was absent. The cell boundary was unclear and tumor cells appeared to form a syncytium. Pseudoepitheliomatous hyperplasia of the mucosa overlying the tumor was not observed. Granules in the cytoplasm were stained by periodic acid Schiff (PAS) reagent. From these findings, this tumor was diagnosed as granular cell tumor of the esophagus. S-100 protein was demonstrated in granules by the use of peroxidase anti-peroxidase (PAP) technique with DAKO's rabbit antiserum (DAKO Co., Santa Barbara, USA). Meanwhile tests for carcinoembryonic antigen (CEA) were negative by the same method.

Eight additional biopsy specimens were obtained by endoscopy on another day for subsequent electron microscopic study. Fresh specimens were immediately fixed in 2% glutaraldehyde and postfixed in 1% osmium tetroxide, for 2 h at 4°C, respectively. After dehydration through a series of ethanol and infiltration with propylene oxide, they were embedded in Quetol 812 (Nishin EM Co., Tokyo, Japan). The ultrathin sections were poststained with uranyl acetate and lead citrate, and examined with a Hitachi H600 electron microscope (Hitachi Co., Tokyo, Japan).

Clusters of tumor cells were surrounded by basal lamina and collagen fibers. No special structure between individual cells was observed. Most of the tumor cells had dark cytoplasm which contained numerous granules of various sizes. These granules had an electron-dense outer limiting membrane and vesicular or membranous content, and resembled lysosomes and phagosomes. Organellae such as Golgi apparatus, mitochondria and endoplasmic reticulum were generally inconspicuous. In a few cells with clear cytoplasm where granular formation was insufficient, some mitochondria and endoplasmic reticulums were seen, but they were poorly developed. Fibrillar internal materials and myelin-like membranous structures were sparsely found in the clear cytoplasm. In addition, microtubular structures arranged in parallel, which were considered to be a premature angulate body, were also demonstrated.

The patient has been observed carefully by periodic endoscopy for twenty-three months since the first examination. The lesion has remained unchanged in gross appearance and in size with no treatment.

Discussion

Granular cell tumor of the esophagus is usually symptom free, unless the tumor grows and obstructs the lumen of the esophagus. Of the seventy-four patients collected by Subramanyam et al., nearly 60% were asym-