AN ULTRASTRUCTURAL STUDY OF THE BRUNNER'S CYST

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Summary

A Brunner's cyst, removed from a 54-year-old woman, was studied by light and electron microscopy. The cyst was spherical, measured 1.5 cm in diameter and was located in the duodenal bulb. Histologically, the cyst, confined in the submucosa, consisted of a single layer of epithelial cells and connective tissue. The epithelial cells were composed of an orderly array of tall columnar cells containing basal round nuclei and fine granular cytoplasm. Ultrastructurally, the epithelial cells contained many secretory granules in the cytoplasm. Each secretory granule was membrane-bound and appeared electron-lucid with a dense core. They were small and sparse around the Golgi apparatus but large and numerous in the apical region. Multinucleated cells were intermingled with cells of the epithelial lining.

Key Words: Brunner's cyst, Brunner's gland, secretory granule.

Introduction

Tumors occurring in the Brunner's gland are most commonly encountered in the duodenal bulb, as might be expected from their anatomical distribution in the duodenum. Of the 516 reported cases of benign duodenal tumors, 73 have been Brunner's adenoma and 8 were Brunner's cysts. The 8 cases of Brunner's cysts were studied by light microscopy only. This is the first ultrastructural report of this type of neoplasm.

Case

A 54-year-old woman was admitted to Juzenkai Hospital on July 27, 1975, complaining of nausea, vomiting and epigastric pain which she had endured for several days. An upper gastrointestinal X-ray demonstrated a round mass within the duodenal bulb (Fig. 1). A fiberoptic endoscopy revealed a spheroid tumor measuring 1.5 cm in the anterior wall of the duodenum. A diagnosis of benign submucosal tumor in the duodenum was proposed.

During surgery, a smooth cystic lesion was located in the anterior wall of the duodenum. The tumor was then excised along with the duodenal wall. The patient made an uneventful postoperative recovery.

Fig. 1. An upper gastrointestinal X-ray. A smooth spherical lesion is visible in the duodenal bulb.
Materials and Methods

Surgical specimens were taken from the cyst and duodenal mucosa. Tissues for light microscopy were fixed in 10\% formalin and embedded in paraffin. Paraffin sections were stained with H & E and mucin.

Tissues for electron microscopy were minced into 1 mm cubes, fixed in cold buffered 1.4\% glutaraldehyde, stained with 4\% osmium tetroxide, dehydrated in graded ethanols and embedded in Epon 812. Ultrathin sections were stained with uranyl acetate and lead citrate, and examined in Hitachi-12, JEM-7A and 100 B electron microscopes.

Results

Light Microscopic Findings:
The excised Brunner's cyst, which was completely confined in submucosal tissue, consisted of a single inner layer of epithelial cells and an outer layer of connective tissue. The epithelial cells were composed of an orderly array of tall columnar cells containing a round basal nucleus. The cytoplasm contained fine granules, stained lightly eosinophilic with H & E stain and was slightly positive for mucin. Mitosis was rarely observed (Fig. 2).

Electron Microscopic Findings:

The epithelial cells of the cyst were monotonous and were connected to each other by desmosomes and interdigitations. They were separated from the stroma by several layers of basal laminae. The luminal surface was lined with stubby microvilli.

The nucleus was round and contained a prominent nuclei. There were many secretory granules in the cytoplasm. Each secretory

Fig. 2. Histologic feature of Brunner's cyst with mucin stain. The epithelial cells are tall, regularly arranged and contain fine granular cytoplasm and basal nuclei. ×320

Fig. 3. Electron micrograph of epithelial cells of Brunner's cyst. The epithelial cells are connected by desmosomes (D) and interdigitations (T) and are separated from the stroma by several layers of basal lamina. The secretory granules are sparse around the Golgi apparatus and numerous in the apical region. Many lysosomes (Y) and lipid inclusions (L) are also visible in the cytoplasm. Monocytes (M) are noted beneath the epithelial lining. ×2400