In-Vitro Endosonographic Appearance of Muscularis Mucosae of the Esophagus

Superficial esophageal cancer (SEC) with submucosal invasion has a similar risk of lymph node spread as has advanced gastric cancer (1). Clinically, it is important to distinguish between penetration of esophageal cancer to the mucosa (m) or the submucosa (sm). Recently, we have described a technique for improved accuracy of endosonographic staging of patients with SEC that is based on visualization of the muscularis mucosae (mm) (2). We studied the in-vitro endosonographic detection of mm using endoscopically resected specimens.

We scanned noncancerous areas of four endoscopically resected formalin-fixed specimens of SEC using a 20-MHz, radial linear mode switchable probe (Sonoprobe system, SP-501, Fuji Photo Optical Co., Omiya, Japan). We observed a thin hyperechoic layer (Figure 1, 2c layer) in the boundary between the second and third layers in two specimens similar to the appearance of the stomach (3). A pin punctured into the lamina propria was sonographically observed in the hyperechoic ("2b") layer located in the middle of the second layer of the conventional five-layered structure (Figure 2) (4). The muscularis mucosae was located between the pin and submucosa (Figure 3) and corresponded to the hyperechoic (Figure 1, "2c") layer. The hyperechoic first layer and hyperechoic ("2a") layer corresponded to the epithelium. The mm of the esophagus is observed as a thin hyperechoic layer located in the deep aspect of the conventional second layer of the five-layered structure.

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