

Images in Cardiovascular Medicine



Symptomatic Gastroparesis After Cryoballoon Ablation for Atrial Fibrillation

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Conflict of Interest

The authors have no financial conflicts of
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A 68-year-old male underwent cryoballoon atrial fibrillation (AF) catheter ablation (AFCA) for drug refractory paroxysmal AF. The preprocedural computed tomography (CT) revealed usual anatomy of pulmonary veins (PVs) (**Figure 1A and B**). During the procedure, 4 PVs were successfully isolated after delivery of cryothermal energy and procedure was successfully finished (**Figure 1C-F** and **Supplementary Table 1**). He was discharged one day after procedure without complication. The next day after discharge, he visited hospital complaining of abdominal distension and nausea. Abdominal X-ray and CT revealed severe gastric distension and esophagogastroduodenoscopy showed large amount of undigested food residues without obstructing lesion suggestive of gastroparesis (**Figure 2**). With impression of symptomatic gastroparesis caused by periesophageal vagal nerve injury during cryoballoon AFCA, we treated him with fasting, gastric decompression using L-tube, and bowel motility medicines and discharged after 7 days. His symptom was improved at 3 months of visit and serial CT images showed recovery of gastroparesis (**Figure 3**).

The vagus nerve courses posterior to the left atrium and control pyloric sphincter relaxation and gastric antrum motility (**Figure 4**). Collateral damage of periesophageal vagal nerve during AFCA can cause symptomatic gastroparesis.¹⁾ Although most cases were reported to occur after radiofrequency catheter ablation with additional linear ablation²⁾ our case occurred after cryoballoon ablation method. Previous study reported that middle-positioned esophagus could be an associated factor with gastroparesis after procedure.³⁾ Although the optimal strategies to prevent gastroparesis remain poorly understood, several approaches, such as recognition of esophagus position or esophageal temperature monitoring, should be attempted for safe procedure.

Written informed consent was obtained from the patient.

Data Sharing Statement

The data generated in this study is available from the corresponding author upon reasonable request.

Author Contributions

Conceptualization: Cho S, Lee JK, Hwang ES; Resources: Lee JK; Supervision: Lee JK, Hwang ES; Writing - original draft: Cho S, Lee JK; Writing - review & editing: Cho S, Lee JK.

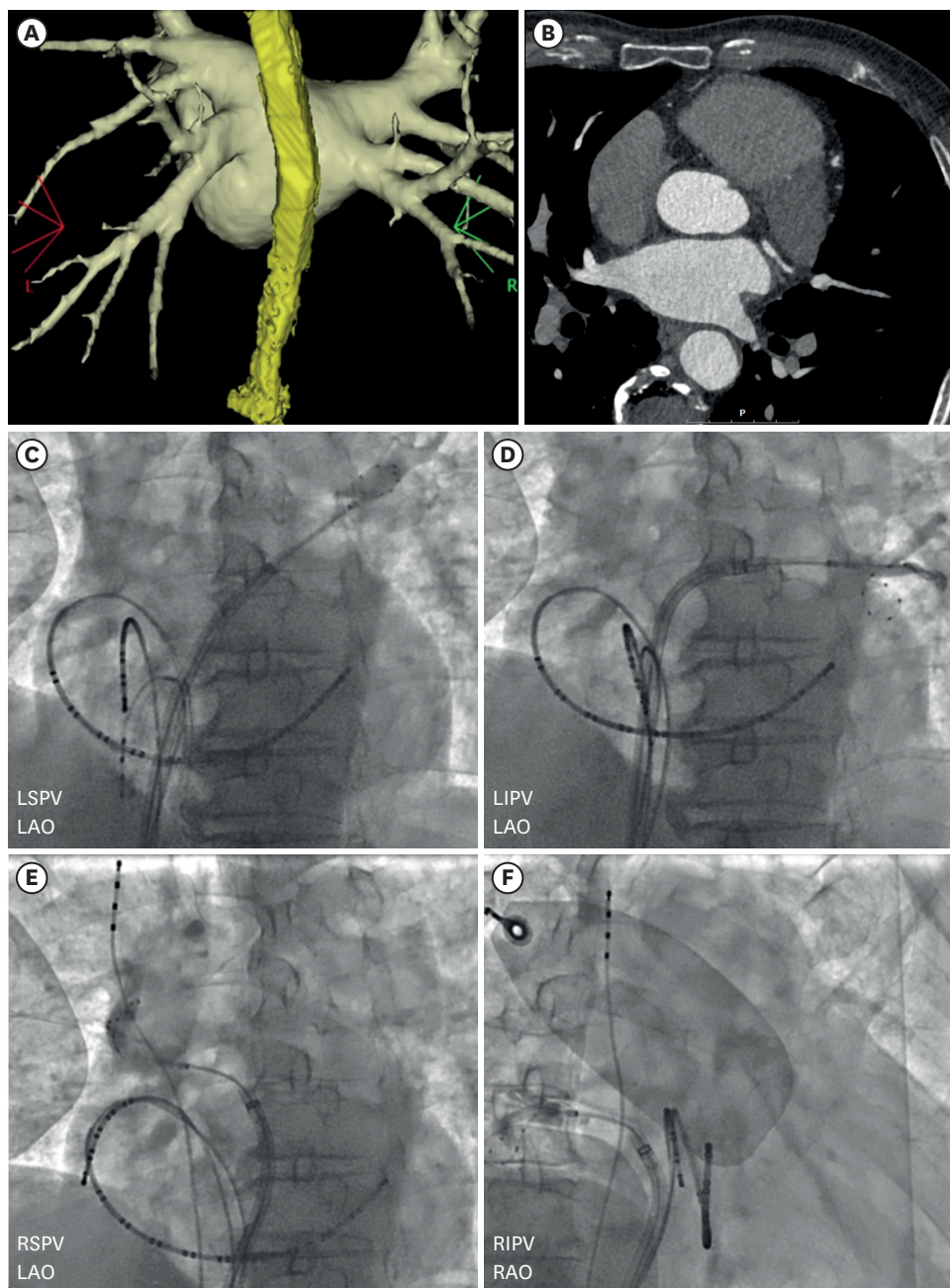


Figure 1. Pre-procedural CT images and cine images during cryoballoon ablation. (A) Three-dimensional reconstructed LA image showed common anatomy of 4 PVs and (B) esophagus (*) position at the level of the PVs was middle which was classified when the midline of the esophagus was centered on the vertebrae. Cryoballoon ablation was performed at each 4 PV (C-F).
 CT = computed tomography; LA = left atrium; LAO = left anterior oblique; LIPV = left inferior pulmonary vein; LSPV = left superior pulmonary vein; PV = pulmonary vein; RAO = right anterior oblique; RIPV = right inferior pulmonary vein; RSPV = right superior pulmonary vein.

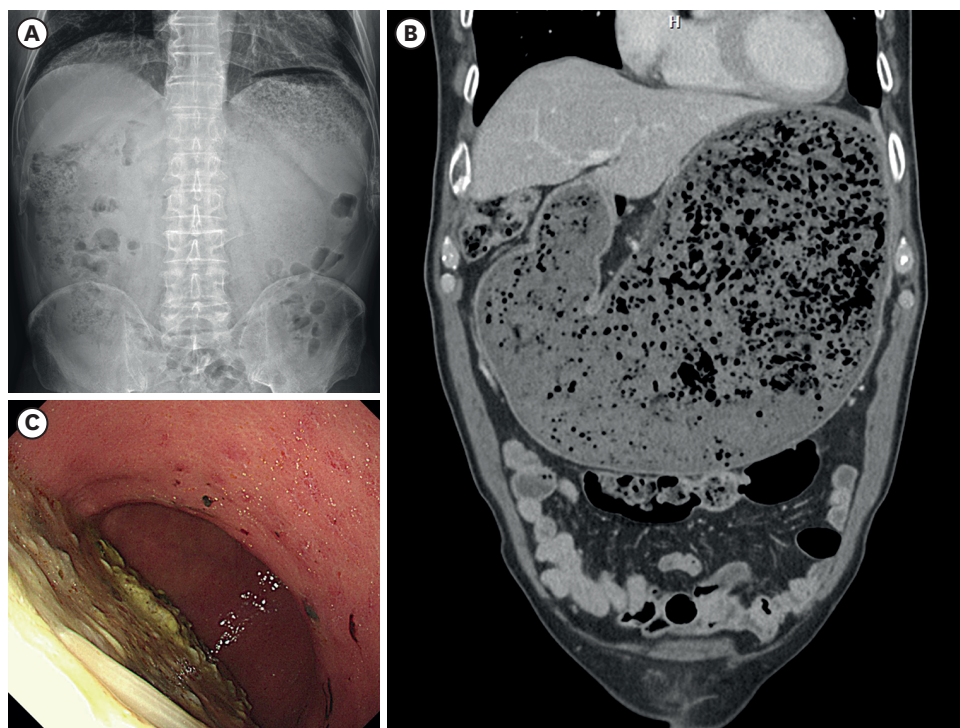


Figure 2. Abdomen X-ray, CT, and esophagogastroduodenoscopy images. Abdominal (A) X-ray and (B) CT images revealed severe gastric distension and (C) esophagogastroduodenoscopy showed large amount of undigested food residues without obstructing lesion. CT = computed tomography.

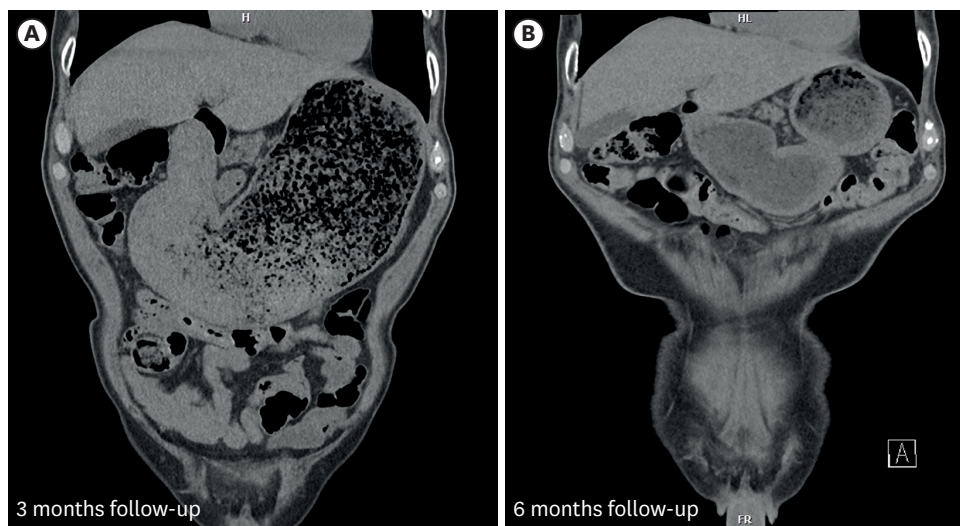


Figure 3. Serial abdomen CT follow-up images at 3 and 6 months. (A) Three months follow-up CT showed still distended but slightly improved gastric distension compared to initial CT and (B) 6 months follow-up CT revealed almost complete recovery of gastroparesis. CT = computed tomography.

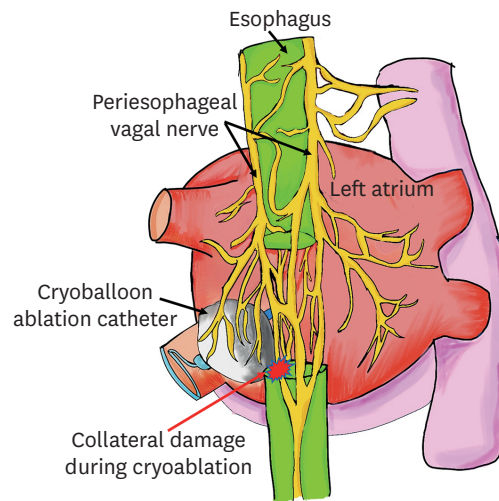


Figure 4. The relative position of the left atrium, esophagus, and periesophageal vagal nerve and mechanism of collateral cryothermal damage of periesophageal vagal nerve during cryoballoon ablation.

SUPPLEMENTARY MATERIAL

Supplementary Table 1

Details of the procedural parameters

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