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Single Case

A Case of Gastroparesis after Cryoballoon Ablation followed by Medication-Induced Recovery within 6 Months

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Keywords

Gastroparesis · Cryoballoon ablation · Atrial fibrillation · Delayed gastric emptying

Abstract

Atrial fibrillation (AF) is the most common cardiac arrhythmia, and cryoballoon ablation was developed as a new treatment modality for symptomatic AF. Gastroparesis is rarely reported as a transient complication of ablation, and its frequency and risk are not clear. We experienced a rare case of gastroparesis after cryoballoon ablation followed by medication-induced recovery within 6 months.

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Introduction

Atrial fibrillation (AF) is the most common cardiac arrhythmia, and 1–3% of the general population have it [1]. Conventional catheter ablation was performed with point-by-point radiofrequency ablation for pulmonary vein isolation. Cryoballoon ablation was developed as a new treatment modality for symptomatic AF. This treatment uses a cryoballoon with nitrogen

monoxide to isolate the pulmonary vein by coagulative necrosis so that we can make circular damage of the pulmonary vein at once. Therefore, it is thought to be safer and easier to perform than conventional radiofrequency catheter ablation [2]. However, some major complications of ablation were reported, such as tamponade, stroke, phrenic nerve paralysis, pulmonary vein stenosis, and atrioesophageal fistula formation [3]. Also, gastroparesis is rarely reported as a complication of ablation, but the accurate frequency and risk is not clear because X-ray, computed tomography, or esophagogastroduodenoscopy are not performed without symptoms. Here we present a rare case of gastroparesis after cryoballoon ablation who recovered with medication within 6 months.

Case Presentation

A 78-year-old man who had experienced a myocardial infarction many years previously underwent cryoballoon ablation treatment for symptomatic AF. There were no gastrointestinal symptoms before the ablation and no gastric dilatation was confirmed by X-ray (Fig. 1a). Three days later, he visited our hospital and complained of abdominal fullness and constipation. A blood test showed no apparent abnormalities. His abdominal X-ray showed a big amount of food residue in his stomach (Fig. 1b). We prescribed magnesium oxide and mosapride citrate hydrate, but the symptoms did not improve. Computed tomography showed marked gastric dilatation without any intestinal obstruction. Esophagogastroduodenoscopy was also performed and revealed a big amount of food residue, despite the fact that 16 h had passed from the last meal (Fig. 2a). Upper gastrointestinal series also revealed severe gastroparesis (Fig. 3). He was started on vonoprazan fumarate (a novel potassium-competitive acid blocker) and Rikkunshito (a Japanese herbal medication). His symptoms of abdominal fullness did not completely improve until 5 months after treatment, although abdominal X-rays continued to show residual food in his stomach 16 h after his last meal. This symptom, however, gradually improved, and his gastroparesis was cured 6 months after cryoballoon ablation (Fig. 1b–d, Fig. 2b).

Discussion

Gastroparesis is defined as delayed gastric emptying without mechanical obstruction of the stomach. The symptoms are abdominal fullness, nausea, and vomiting. There is no clear diagnosis criterion, so we have to exclude organic disease by endoscopy and imaging tests such as X-ray, computed tomography, and gastrointestinal series. A blood test is also useful to exclude electrolyte abnormality, diabetes, and dysfunction of the thyroid gland.

The major causes of gastroparesis are postsurgical, diabetes, idiopathic, and drugs such as anticholinergics, opioids, levodopa, tricyclic antidepressants, and phenothiazines [4]. Gastroparesis can also occur following radiofrequency catheter ablation. Gastroparesis after catheter ablation has been associated with periesophageal vagal plexus injury, which may be avoided by monitoring of esophageal temperature [5]. Some patients have been reported to experience gastroparesis after cryoballoon ablation, with all of these patients recovering from symptoms within 2 months [6]. Therefore, the mechanism by which cryoballoon ablation induces gastroparesis is thought to involve reversible damage to the nerve resulting from transient coagulation. The cause of gastroparesis in our patient was unclear because his esophageal temperature was monitored appropriately. Moreover, the duration of gastroparesis in

this patient was 6 months. These characteristics suggest that unknown factors may have affected the pathogenesis of gastroparesis in this patient. Prospective studies are required to assess the details of gastroparesis induced by cryoballoon ablation.

Statement of Ethics

The authors have no ethical conflicts to disclose.

Disclosure Statement

The authors have no conflicts of interest to disclose.

Author Contributions

All authors were involved in the clinical management of and communication with the patient, and all were involved in the design of the study. Y. Sunata drafted the manuscript and H. Mori made contributions to the manuscript. All authors approved the submission of the final draft.

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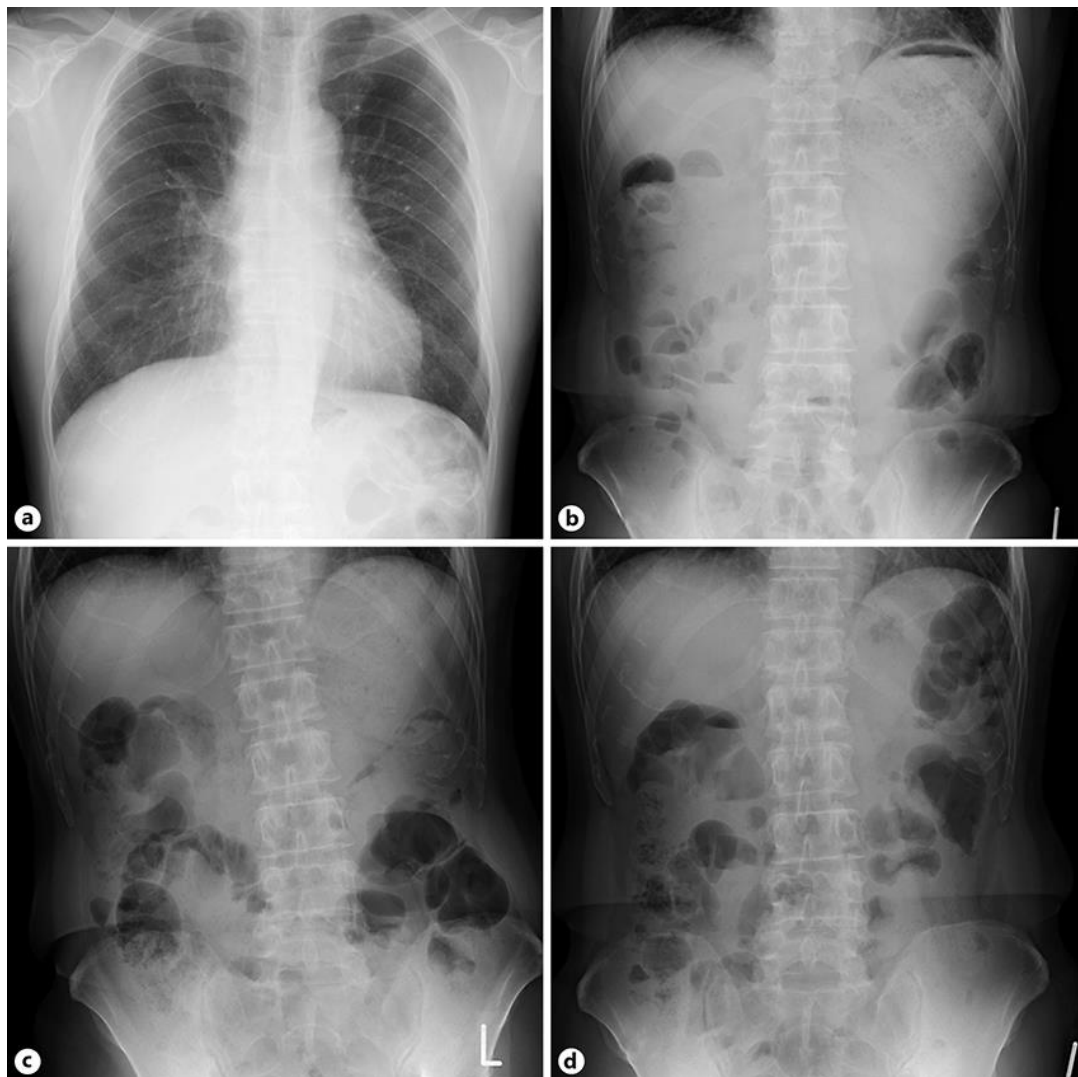


Fig. 1. X-rays of the patient. **a** Chest X-ray before ablation showing no food residue in the stomach. **b–d** Abdominal X-rays 3 days (**b**), 5 months (**c**), and 6 months (**d**) after ablation. Residual food was present in the stomach at 3 days and 5 months, but not at 6 months after ablation.

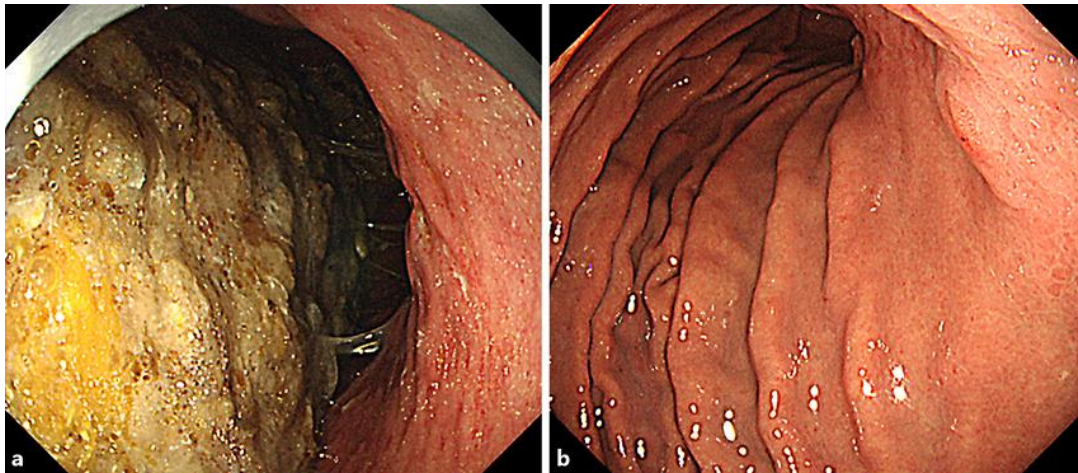


Fig. 2. **a** Esophagogastroduodenoscopy performed 17 days after the ablation, showing a large amount of food residue in the stomach 16 h after the patient's last meal. **b** Six months after the ablation there was no food residue in the stomach.

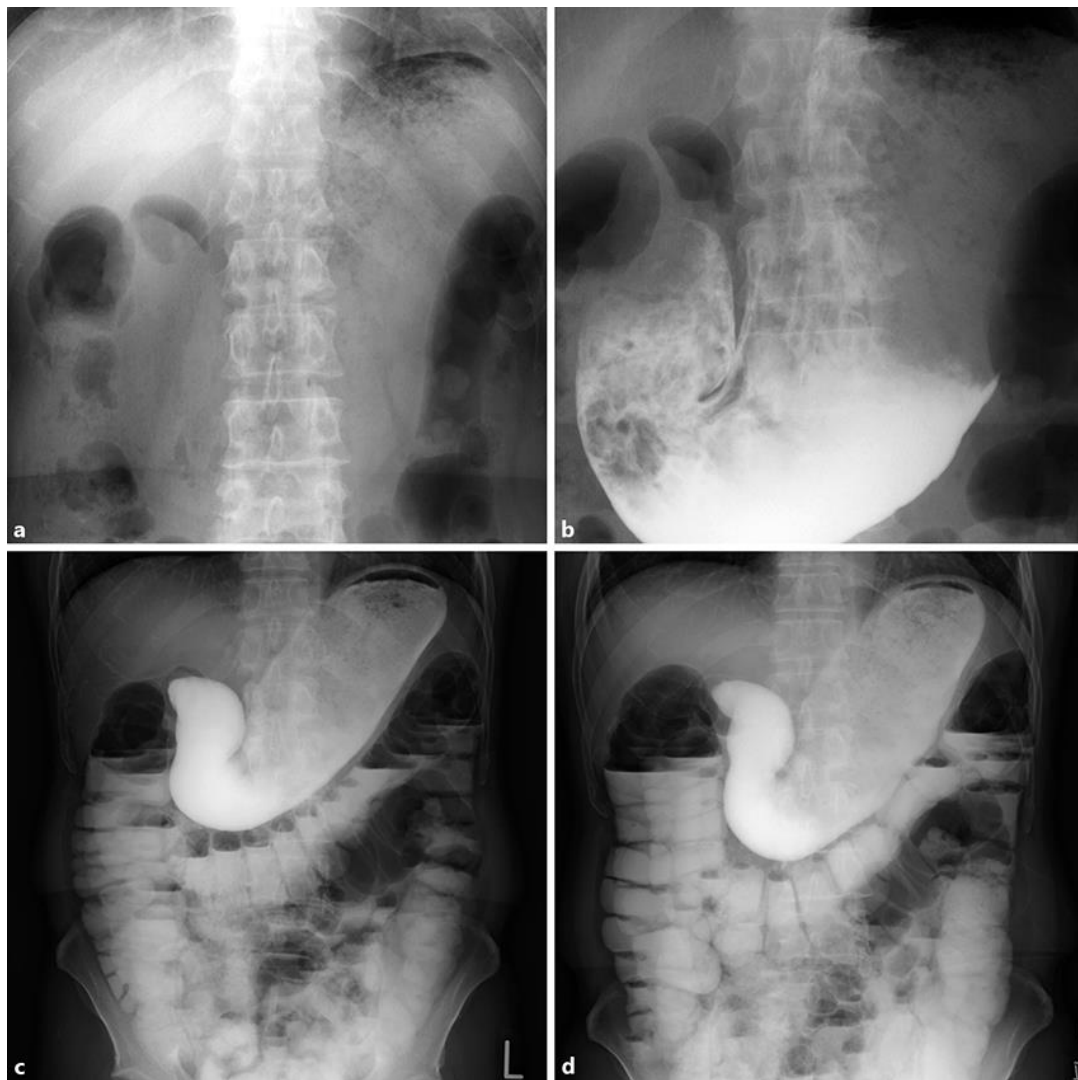


Fig. 3. Gastrointestinal X-ray series performed 33 days after ablation prior to taking the contrast agent (**a**) and immediately (**b**), 1 h (**c**), and 2 h (**d**) after taking the contrast agent. Severe gastric dilatation and gastroparesis were observed, but the motility of the small intestine and colon was not affected.