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case Report

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Gastroparesis Following Pulmonary Vein Isolation: A Case Report

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1. Abstract

Gastroparesis is a chronic disorder characterized by delayed gastric emptying after meals in the absence of any mechanical obstructions, especially pyloric stenosis [4]. The main symptoms include early satiety and fullness after a meal, nausea, vomiting, belching and bloating [5]. Gastroparesis is a complication of AF ablation which arises due to iatrogenic damage to the periesophageal VN fibers. Most cases are asymptomatic, but our patient suffered from weight loss, abdominal pain and vomiting. This report describes a case of severe gastroparesis resulting following RF catheter ablation of AF.

2. Introduction

Catheter ablation (CA) is the most common ablation procedure for patients with symptomatic paroxysmal (PEAF) or persistent atrial fibrillation (AF). Pulmonary vein isolation (PVI) is the most common treatment for AF and PEAF. During the procedure, the major gastrointestinal complications associated with CA and radiofrequency ablation include gastroparesis, atrioesophageal fistula, oesophageal thermal lesion and oesophageal ulcers [1,2].

The mechanism of iatrogenic vagus nerve (VN) injury during procedure resulting in gastroparesis remains poorly defined. The most plausible mechanism appears to be a collateral damage to the periesophageal VN fibers, which comprise the left vagal trunk and course anterior to the esophagus close to the left atrium and pulmonary vein (PV). These fibers branch off to innervate the gastric antrum and pyloric spinchter [3].

In the distal part of the stomach, the membrane potential of smooth muscle cells is not maintained at a stable level but is interrupted ubiquitously, repetitive variation in electric potential. These potentials are marked as «slow waves», «basic electric rhythm», «control potentials» or «starter potentials» rhythm. Stomach slow waves are generated from areas in the central part of the body along the large curvature. This area acts as a gastric center guide or pacemaker. Gastroparesis is a chronic disorder characterized by delayed gastric emptying after meals in the absence of any mechanical obstructions, especially pyloric stenosis [4]. The main symptoms include early satiety and fullness after a meal, nausea, vomiting, belching and bloating [5]. The syndrome is caused by neuromuscular dysfunction that leads to delayed gastric emptying. A native X-ray abdominal image showed a distended stomach full of contents. EGDS showed a stomach full of food and lack of peristaltic waves. Multislide computed tomography (MSCT) showed intestinal peristalsis and filling of intestinal convolutions with contents. There are just a few cases of gastroparesis described in literature. Thimmapuram Jayaram and Co (2010), described treatment with ondansetron after a failed metoclopramide treatment. S. Sakabe and Co described hidden gastroparesis in 16.1 % of patients who undergo RFA (study with 236 patients). Neal Beri in August 2021 described a case of gastroparesis after a cryoballoon pulmonary vein isolation in a 63-year-old man treated with metoclopramid. The first step in the treatment was a diet. The diet included low-fat, water-soluble fiber meals. Medications included metoclopramide, erythromycin and domperidone, and in some cases a feeding jejunostomy was

required. Gastric peroral endoscopy myotomy (G-POEM) is an endoscopic procedure that is performed by creating a short submucosal tunnel in the distal stomach, often along the greater curvature of the stomach. The pylorus is subsequently identified within the submucosal tunnel and divided with an electrocautery device with the goal to minimize any resistance to food passage that may have been related to pylorospasm. G-POEM evolved from the oesophageal POEM procedure used to treat achalasia, as both achalasia and gastroparesis share similar pathophysiologic mechanisms [7]. This procedure shows promise; though additional re-search is needed. The last procedure is a gastric electrical stimulation, a surgically implanted device which provides electrical stimulation to the stomach muscles to move food more efficiently. The gastric electrical neurostimulator can be implanted via laparotomy or laparoscopic surgery. The device consists of a pair of leads, a pulse generator, and a programming system. The leads are placed in the muscularis propria of the greater curvature of the stomach, about 10 cm proximal to the pylorus and connected to a pulse generator. The pulse generator is typically placed subcutaneously in the right or left upper quadrants of the abdomen. An external programming device controls the gastric stimulation parameters. The battery life is typically 5 to 10 years, but this duration can vary depending on the energy level settings [8].

3. Case Report

A 47-year-old man was referred to our department with symptomatic persistent atrial fi-brillation. The patient had no family history for persistent atrial fibrillation. From the November of 2020, the patient is in atrial fibrillation, which was accidentally found during a systematic exami-nation. Attempted cardioversion twice, but without success. New oral anticoagulans (NOAK) included in the therapy. No other cardiac conditions were found. Since April 2012 he is being treated with levothyroxine due to hypothyroidism. Orderly physical status; atrial fibrillation at a frequency of 80 beats per minute.

All blood tests including cholesterol and thyroid stimulating hormone (TSH) levels were within normal limits Ultrasound of the heart showed a structurally normal heart with a mildly dilated left atrium.

Radiofrequency ablation procedure (RFA): We used two separate punctures in the right femoral vein. We gave 13000 IU of unfractionated heparine aiming activating clothing time > 300 s. We first placed intracardiac ultrasound (AcuNav, 8 Fr, Biosense-Webster, CA, USA) in the right atrium and then a transseptal needle (BRK transseptal needle, St. Jude Medical, Inc., MN, USA) was placed in the right atrium from an 8.5-French steerable sheath via the right femoral vein. The transseptal puncture was performed under flouroscopic and ICE control. We performed ana-tomical and bipolar mapping using a multipolar mapping catheter (PENTARAY™ NAV, Biosense Webster, CA, USA). No left atrial scaring was detected.

Open-irrigated contact force-sensing catheter (THERMOCOOL SMARTTOUCH® SF, Bio-sense Webster, CA, USA) was used for point-by-point pulmonary vein isolation. We performed pulmonary vein isolation (PVI) using the “Ablation Index” (400 posterior wall and roof and 550 anterior wall) and the power was set to 45 W during the whole procedure. PVI sinus rhythm was later restored by an electric cardioversion. The bidirectional conduction block between the pul-monary veins and the left atrium was confirmed. The patient was discharged the next day from hospital. On admission, he was taking amiodarone, rivaroksaban and levothyroxine (Figure 1).

On the sixth day after the procedure, the patient started to vomit with a feeling of fullness in his stomach. X - ray image of the abdomen shows a stomach full of contents (Figure 2).

The first EGDS was done on the seventh day after RFA. The stomach was full of food. The next day the pylorus managed to pass. The patient was treated with high doses of proton pump inhibitors, liquid diet. Six days after the introduced therapy, EGDS was repeated, but the food was already in the esophagus. Pyridostigmine and erythromycin were introduced into the therapy. We included pyridostigmine – acetylcholinesterase inhibitor (0.25 mg/kg/day) [6] because it decreased abdominal distention, increased bowel movement frequency, and improved enteral feeding toler-ance. We also included erythromycin (250 mg/ every six hours). Erythromycin increased the activity of the stomach to help it to empty more quickly. Due to weight loss and inability to ingest solid foods, only enteral nutrition was introduced. Three days after this therapeutic regimen, repeated EGDS proved a tidy upper gastrointestinal tract for the first time. Control abdominal ultrasound after one month of treatment excluded gastric distension. The patient gained body weight, eats smoothly and has no abdominal pain. There was no longer need to take pyridostigmine and erythromycin. The patient has a sinus rhythm of his heart on regular check-ups with a cardiologist, so there is no need to take amiodarone, rivaroksaban.

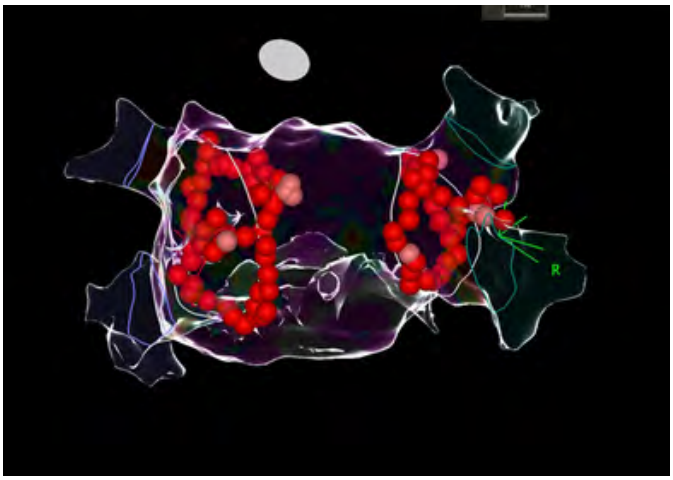

Figure 1: Left atrium folder at the end of the radio frequency ablation procedure.

Figure 2: Native X-ray of the abdomen full of food

4. Conclusion

Gastroparesis is a complication of AF ablation which arises due to iatrogenic damage to the periesophageal VN fibers. Most cases are asymptomatic, but our patient suffered from weight loss, abdominal pain and vomiting. We included pyridostogmine and erythromycin in our patient's therapy which resulted in success. Searching the literature, we found several papers describing the use of erythromycin, metoclopramide, rarely mosapride citrate, but not pyridostigmine in this indication. However, a study with a large number of patients is needed to show a clear efficacy of pyridostigmine and erythromycin in the treatment of gastroparesis causing iatrogenic damage to the vagus nerve during RFA.

References

1. Akhtar T, Calkins H, Bulat R, Pollack MM, Spragg DD. Atrial fibrillation ablation-induced gastroparesis: A case report and literature review. Heart Rhythm Case Rep. 2020; 6(5): 249-52.
2. Sunata Y, et al. Case of Gastroparesis after Cryoballoon Ablation followed by Medication-Induced Recovery within 6 Months. Case Rep Gastroenterol. 2018; 12(2): 473-8.
3. Cappato R, et al. Prevalence and causes of fatal outcome in catheter ablation of atrial fibrillation. J Am Coll Cardiol. 2009; 53(19): 1798-803.
4. Garg L, et al. Gastrointestinal complications associated with catheter ablation for atrial fibrillation. Int J Cardiol. 2016; 224: 424-30.
5. Camilleri M, et al. Gastroparesis. Nat Rev Dis Primers. 2018; 4(1): 41.
6. Manini ML, Camilleri M, Grothe R, Di Lorenzo C. Application of Pyridostigmine in Pediatric Gastrointestinal Motility Disorders: A Case Series. Paediatr Drugs. 2018; 20(2): 173-80.
7. Law RJ. Gastric Peroral Endoscopic Myotomy for Gastroparesis. Gastroenterol Hepatol. (N Y). 2019; 15(12): 685-7.
8. Hasler WL. Electrical stimulation for gastroparesis. UpToDate; [updated 2020 May 5; cited 2022 March 1].