Received: 19 February 2022 | Revised: 1 September 2022 | Accepted: 10 November 2022

DOI: 10.1002/ccr3.6644

CASE REPORT

Clinical Case Reports Open Access WILEY

Acute myocardial infarction followed by radiofrequency therapy for gastroesophageal reflux disease in a man: A case report

Zhihong Xu[1] | **Suyu He**[1,2] | **Xin Xiong**[1] | **Xiumei Zhang**[1] | **Caiju Feng**[1] | **Shilin Tang**[2] | **Yijun Liu**[3] | **Lili Wu**[1]

[1]Zunyi Medical University, Zunyi, China

[2]The Fourth Department of the Digestive Disease Center, Suining Central Hospital, Suining, China

[3]The Department of Cardiovascular, Suining Central Hospital, Suining, China

Correspondence
Suyu He, The Fourth Department of the Digestive Disease Center, Suining Central Hospital, Suining 629000, China.
Email: hesuyu2009@163.com

Abstract

Coronary artery disease (CAD) is a common comorbidity of gastroesophageal reflux disease. Since the distal esophagus and heart share a common afferent vagal supply, the delivery of radiofrequency in the distal esophagus can stimulate the coronary artery and induce acute myocardial infarction in a patient with CAD.

KEYWORDS

acute myocardial infarction, coronary artery disease, gastroesophageal reflux disease, radiofrequency therapy

1 | CASE PRESENTATION

Since the first report in 2001, esophageal radiofrequency (RF) therapy has proven to be safe and effective in treating refractory gastroesophageal reflux disease (GERD).[1,2] More than 25,000 refractory GERD patients have undergone RF therapy over the last 17 years.[2,3] However, is it a safe choice for patients with refractory GERD and other comorbidities? Here, we report a case of acute myocardial infarction (AMI) followed by RF therapy. Although CAD can exist simultaneously with GERD,[3,4] to the best of our knowledge, no reports describe ACI followed by RF therapy in GERD patients.

A 62-year-old man presented with a 4-year history of heartburn. The symptoms were aggravated by lying down and relieved by proton pump inhibitors (PPIs). He has a history of high blood pressure. Calcium channel blockers were taken routinely, and blood pressure was controlled well. Laboratory investigation was normal except for high cholesterol (5.6 mmol/L). Esophagogastroduodenoscopy was normal. Esophageal motility was normal, but lower esophageal sphincter pressure was 5.8 mmHg. The 24-h pH showed an acid exposure time of 9.1%, a DeMeester score of 31.29, and 109 reflux episodes.

Esophageal RF therapy was implemented to reduce or even stop PPIs usage. Under general anesthesia with endotracheal intubation, RF therapy was performed successfully in 40 min. Immediately after the delivery of RF energy, heat-induced small cautery burns were seen around the cardia (arrow) (Figure 1A,B). Eight hours after the procedure, the patient suddenly complained of more severe heartburn accompanied by chest pain and pressing feelings. The emergency white blood cell (WBC) count was 13.5×10^9/L, cardiac troponin was positive, and electrocardiogram (ECG) showed obviously elevated V1–V3. AMI was confirmed with subsequent coronary angiography which showed 80% stent of the left anterior descending coronary artery (arrow)

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.
© 2022 The Authors. *Clinical Case Reports* published by John Wiley & Sons Ltd.

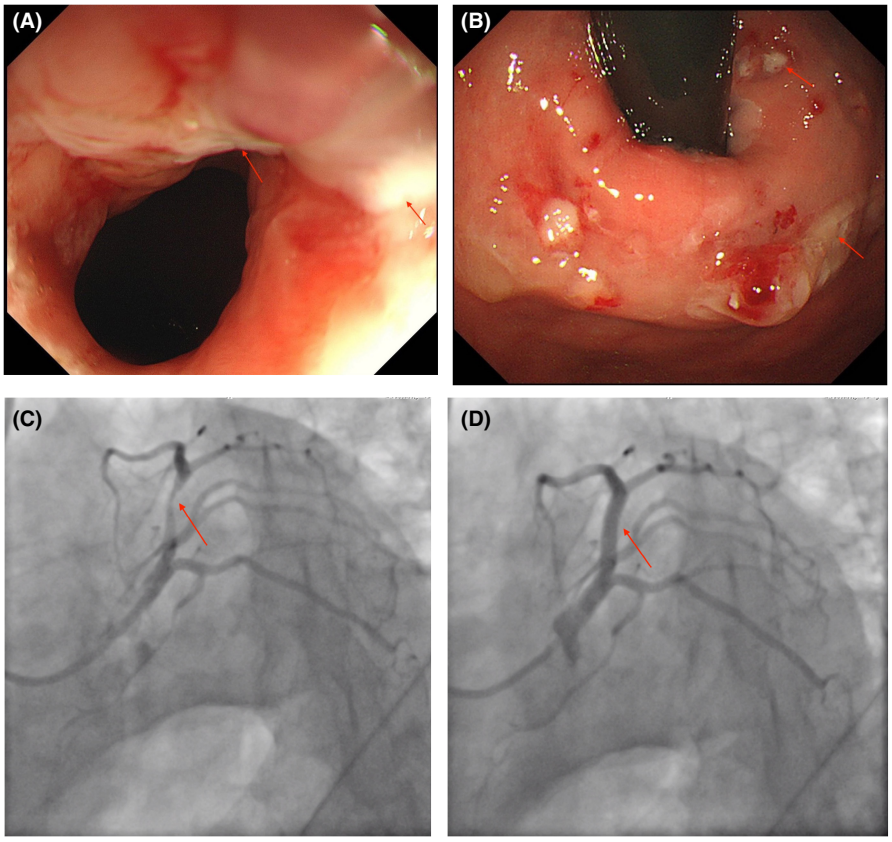

FIGURE 1 Endoscopic images immediately after Stretta procedure and coronary angiography before and after the implantment of the stent

(Figure 1C), and his symptom was disappeared followed by the stent was implanted into the stenosis vessel (arrow) (Figure 1D).

This case underlines the importance of excluding CAD in patients with GERD, especially those with risk factors for CAD, before RF therapy. CAD could be a relative contraindication for RF therapy in the treatment of refractory GERD. AMI could be induced by esophageal RF therapy. Since the distal esophagus and heart are adjacent and share a common afferent vagal supply, the delivery of RF in the distal esophagus and/or cardia may stimulate the coronary artery and induce AMI in a patient with CAD.[5] Several possible mechanisms may attribute to this. First, the stimulation of vagal nerves can reduce heart rate and myocardial contractility, leading to the insufficiency of cardiac perfusion in patients with CAD.[6] Second, the stimulation of vagal nerves could cause coronary vasospasm and plaque shedding of coronary artery.[7] Third, the fluctuation of blood pressure can be another important reason. The patient has high blood pressure and takes antihypertensive drugs regularly. Since fasting is required 24 h after RF therapy, the patients forgot to take antihypertensive medicine in the first 24 h after RF therapy, and this could lead to the fluctuation of blood pressure. The last, the stress conditions after operation could increase the cardiac oxygen demand, which could aggravate myocardial ischemia and induce AMI.

AUTHOR CONTRIBUTIONS

XZ drafted the manuscript; XX, ZX, FC, TS, LY, and WL collected the patient information. HS served as the final diagnosis as well as senior author managing the construction and edits of the manuscript and guiding the primary author through the submission process.

ACKNOWLEDGEMENT

None.

FUNDING INFORMATION

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICAL APPROVAL

Ethics approval was obtained from the Ethics Committee at Suining Central Hospital, Sichuan, China. The patient involved in this report provided written informed consent for the data regarding his case. The patient agreed to undergo all the treatments.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

ORCID

Suyu He https://orcid.org/0000-0002-4541-6865

REFERENCES

1. Richards WO, Scholz S, Khaitan L, Sharp KW, Holzman MD. Initial experience with the stretta procedure for the treatment of gastroesophageal reflux disease. *J Laparoendosc Adv Surg Tech A*. 2001;11:267-273.
2. Vaezi MF, Shaheen NJ, Muthusamy VR. State of evidence in minimally invasive Management of Gastroesophageal Reflux: findings of a scoping review. *Gastroenterology*. 2020;159:1504-1525.
3. Sandhu DS, Fass R. Current trends in the Management of Gastroesophageal Reflux Disease. *Gut Liver*. 2018;12:7-16.
4. Teragawa H, Oshita C, Ueda T. History of gastroesophageal reflux disease in patients with suspected coronary artery disease. *Heart Vessels*. 2019;34:1631-1638.
5. Eisa M, Sandhu A, Prakash R, Ganocy SJ, Fass R. The risk of acute myocardial infarction in patients with gastroesophageal reflux disease. *J Neurogastroenterol Motil*. 2020;26:471-476.
6. Yasue H, Mizuno Y, Harada E. Coronary artery spasm-clinical features, pathogenesis and treatment. *Proc Jpn Acad Ser B Phys Biol Sci*. 2019;95:53-66.
7. Guragai N, Rampal U, Vasudev R, et al. Coronary vasospasm complicating atrial fibrillation ablation: a case report and review of the literature. *J Community Hosp Intern Med Perspect*. 2020;10:346-349.

How to cite this article: Xu Z, He S, Xiong X, et al. Acute myocardial infarction followed by radiofrequency therapy for gastroesophageal reflux disease in a man: A case report. *Clin Case Rep*. 2022;10:e06644. doi:10.1002/ccr3.6644