

Esophageal Dilatation Post – Gastric Banding And Catheter Ablation For Atrial Fibrillation: A Case Report

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Abstract

Esophageal injury is a potential serious complication of catheter ablation for atrial fibrillation. We report a case of significant esophageal dilatation following previous laparoscopic gastric banding in a patient with permanent atrial fibrillation undergoing a pulmonary vein isolation procedure.

Introduction

Esophageal injury is a potential serious complication of catheter ablation for atrial fibrillation (AF). We report a case of significant esophageal dilatation following previous laparoscopic gastric banding (LGB) in a patient undergoing pulmonary vein isolation (PVI) for atrial fibrillation.

Case Report

A 53 year male with a 2 year history of permanent atrial fibrillation and a prior history of laparoscopic gastric banding (LGB) for obesity underwent a pre-procedure planning cardiac CT scan. Moderate esophageal dilatation was demonstrated on the cardiac CT with the esophageal diameter reaching a maximum of 42mm level with the posterior left atrial wall (Fig 1). A barium swallow showed normal esophageal motility but with markedly slowed emptying times (Fig 2).

A catheter ablation procedure was performed

which included wide pulmonary vein antral electrical isolation guided by a cardiac navigational system (Ensite, St Jude Medical) and intra-cardiac echocardiography (ICE).

The position of the esophagus was delineated on the integrated CT navigational map and on fluoroscopy by placement of an esophageal thermistor probe. Radiofrequency energy was delivered through an open irrigated tip catheter and titrated to maximum 25W and 40°C for lesions applied to the left atrial posterior wall. Esophageal temperature rises were only seen in association with lesions applied to the right inferior pulmonary vein and energy applications here were limited to avoid esophageal temperatures >38.5°C.

At 6 months follow-up the patient remains in sinus rhythm with no complications.

Discussion

The potential for esophageal injury following ab-

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lation on the posterior wall of the left atrium is well recognized. The most severe complication is atrio-esophageal fistula formation, with almost uniformly fatal outcomes.¹ Peri-oesophageal nerve damage is also described following catheter ablation for AF and may result in gastric hypomotility²

Esophageal pathology may increase the potential for injury during catheter ablation procedures for AF. A case of a large esophageal diverticulum has been reported that was recognized prior to a successful PVI, with the diverticulum identified via barium swallow and tagged on the electroanatomic map.³ A documented case of esophageal dilatation due to a massive hiatal hernia resulted in the catheter ablation being abandoned due to the risk of potential esophageal injury.⁴ To our knowledge this is the first report of significant oesophageal dilatation in a patient with a prior history of LGB undergoing catheter ablation for AF.

Esophageal dilatation post LGB is relatively com-

mon with 14-17% of patients developing post-operative dilatation within 6 to 12 months.⁵ This is believed to be due to the reduced gastric pouch and the band posing a higher resistance to passing food. Other complications related to LGB placement that might impact left atrial ablation include pouch formation due to nutritional overload and inflammation or band slippage, all of which have similar effects in creating herniation of the gastric pouch and possibly the esophagus.⁶

A number of techniques have been suggested to reduce the occurrence of esophageal injury during PVI. These include limiting the duration and power of lesion application to the posterior LA wall adjacent to the oesophagus.⁷ Intraprocedural monitoring of the course of the esophagus in relation to the left atrium has also been suggested and includes continuous ICE monitoring of esophagus location,⁸ intraprocedural barium swallow and placement of an oesophageal thermistor.⁹ Reliance on the anatomical relationships from a preprocedural CT scan is recognized as being less accurate

Figure 1:Postero-anterior (left) and cranial (right) views of 3- dimensional reconstruction of the left atrium and dilated esophagus from the preprocedural CT scan.

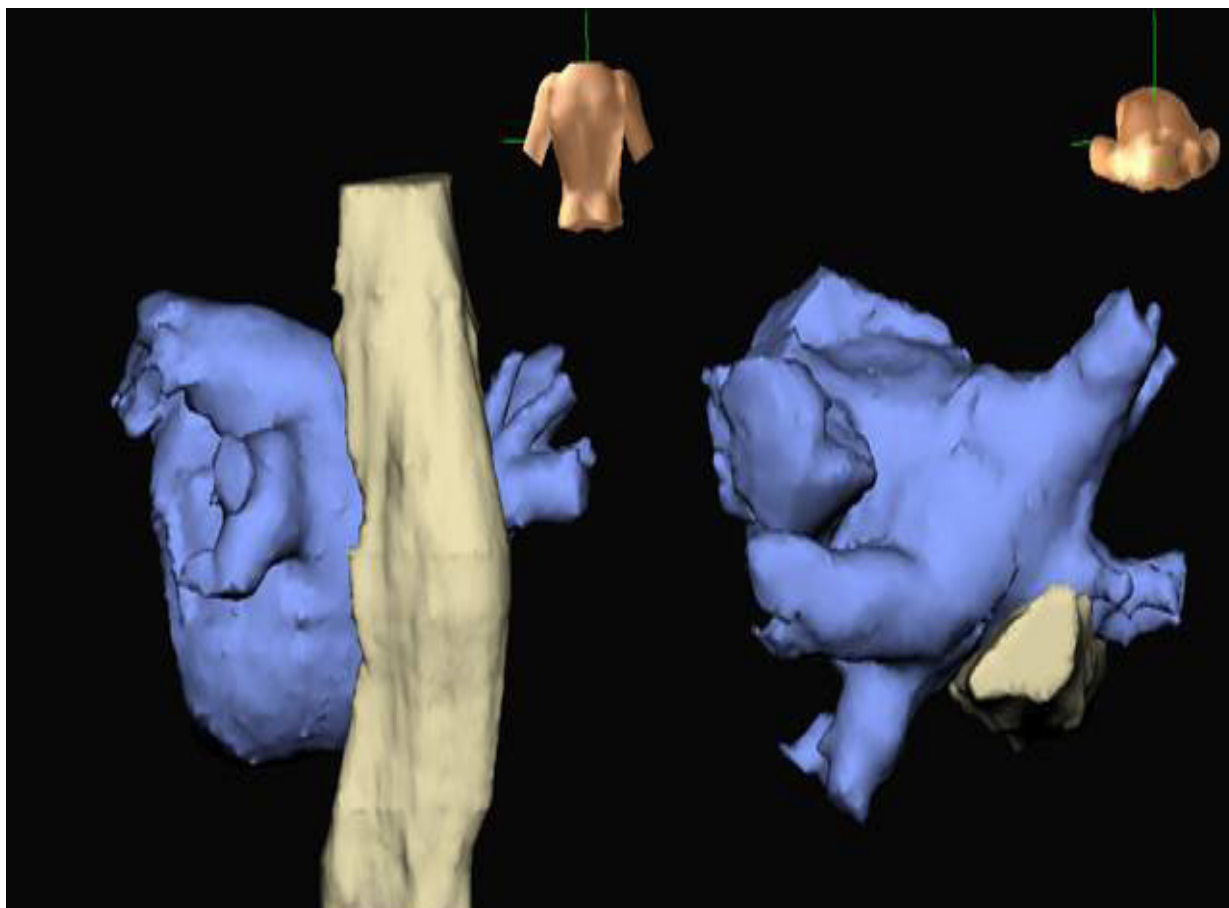
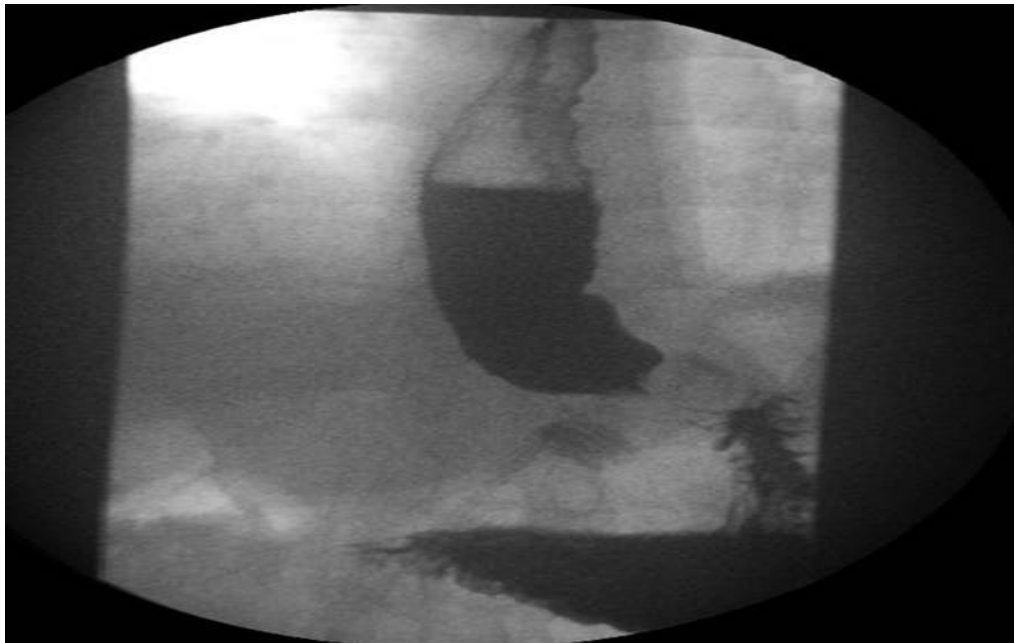


Figure 1: Barium swallow image showing moderate esophageal dilatation with pooling of barium proximal to the gastric band.



as the range of esophageal motion during a catheter ablation for AF has been shown to be greater than 2cm.¹⁰ It is currently unclear what the impact of oesophageal pathology is on “added” vulnerability to injury from cardiac radiofrequency energy application.

As obesity increases in prevalence and the success and ease of weight reduction through LGB makes these procedures more common, it is likely that patients with a history of prior LGB will present increasingly for catheter ablation for AF. Cardiac Electrophysiologists performing catheter ablation procedures for AF should have a good level of awareness of the potential esophageal and gastric complications following LGB. Additional precautions should be taken both to identify potential pathology preprocedurally and also to actively reduce the potential for esophageal injury during ablation.

Conclusions

Esophageal dilatation following LGB is common and may increase the potential for esophageal injury during catheter ablation for AF. Awareness of esophageal pathology in patients with a history of LGB and appropriate procedure planning for catheter ablation may prevent esophageal compli-

cations.

References

1. Ghia KK, Chugh A, Good E, Pelosi F, Jongnarangsin K, Bogun F, Morady F, Oral H. A nationwide survey on the prevalence of atri-esophageal fistula after left atrial radiofrequency catheter ablation. *Journal of Interventional Cardiology*. 2009; 24; 33-36.
2. Shah D, Duminceau J, Burri H, Sunthorn H, Schrott A, Gentil-Baron P, Yokoyama Y, Takahasi A. Acute Pyloric Spasm and Gastric Hypomotility: An Extracardiac Adverse Effect of Percutaneous Radiofrequency Ablation for Atrial Fibrillation. *Journal of the American College of Cardiology*. 2005;46; 327-330.
3. Dey S, Good E, Morady F, Oral H. (2006). Esophageal Diverticulum Illustrated by Barium Swallow During Left Atrial Catheter Ablation for Atrial Fibrillation. *Circulation*. 2006;114; e597.
4. Good E, Wells D, Cronin P, Morady F, Oral, H. Massive Hiatal Hernia and Thoracic Stomach Illustrated by Barium Swallow During Left Atrial Catheter Ablation for Atrial Fibrillation. *Circulation*. 2008;118; 2011-2012.
5. Milone L, Daud A, Durak E, Olivero-Rivera L, Schrop B, Inabet WB, Davis D, Bessler M. Esophageal dilatation after laproscopic adjustable gastric banding. *Surgical Endoscopy*. 2007;22;1482-1486.
6. Prosch H, Tscherny R, Kriwanke S, Tscholakoff D. Radiographical imaging of the normal anatomy and complications after gastric banding. *The British Journal of Radiology*. 2008;81; 753-757.
7. Pappone C, Oral H, Santinelli V, Vicedomini G, Lang CC, Manguso F, Toaracca L, Benussi S, Alfieri O, Hong R, Lau W, Hirata K, Shikuma M, Hall B, Moraday F. Atrio-esophageal fistula complication of percutaneous transcatheter ablation of atrial fibrilla-

tion. *Circulation* 2004;109:2724-2726.

8. Ren J, Lin D, Marchlinski F, Callans D, Patel V. Esophageal imaging and strategies for avoiding injury during left atrial ablation for atrial fibrillation. *Heart Rhythm*. 2006 ;3; 1156-1161.

9. Good E, Oral H, Lemola K, Han J, Tamirisa K, Iqbal P, Elmouchi D, Tschopp D, Reich S, Chugh A, Bogun F, Pelosi F, Morady F. Movement of the Esophagus During Left Atrial

Catheter Ablation for Atrial Fibrillation. *Journal of the American College of Cardiology*, 2005;46; 2107-2110.

10. Cummings JE, Schweikert RA, Saliba WI, Burkhardt JD, Brachmann J, Gunther J, Schibgilla V, Verma A, Dery MA, Drago JL, Kilicaslan F, Natale A. Assessment of temperature proximity and course of the esophagus during radiofrequency ablation within the left atrium. *Circulation* 2005;112:459-464.