1.35 cm protruding right coronary artery stent with an uncomplicated course

Jagadeesh K Kalavakunta ¹,^{id} Pramod Kumar Ponna,² Amritpal Kaur Randhawa,¹ Yashwant Agrawal ¹^{id}

¹Ascension Borgess Hospital, Kalamazoo, Michigan, USA
²Internal Medicine, LSU Health Shreveport, Shreveport, Louisiana, USA

Correspondence to
Dr Yashwant Agrawal;
yashwantagrwal.agrawal@gmail.com

Accepted 8 May 2021

DESCRIPTION

A 74-year-old woman with medical history of coronary artery disease with stent to right coronary artery (RCA) 1 year ago, hypertension, hyperlipidaemia and persistent atrial fibrillation was electively admitted for pulmonary vein isolation (PVI). Limited transoesophageal echocardiogram (TEE) performed prior to PVI showed a highly echogenic structure measuring 0.7×1.35 cm, extending from the right coronary ostium towards the commissure between the right and left coronary cusps. The

Figure 1 Transoesophageal echocardiographic image showing an echo dense "loop" (red arrow) in the ascending aorta in this mid-oesophageal aortic valve long-axis view.

Figure 2 Transoesophageal echocardiographic image showing an echo dense structure (red arrow) in the ascending aorta in this mid-oesophageal aortic valve short-axis view.

Figure 3 CT of the heart showing ostial right coronary artery (RCA) stent protruding into aorta in this vertical long axis coronal view.

findings were consistent with part of the previously placed ostial RCA stent protruding into the coronary sinus (figures 1 and 2). It appeared to have been present since percutaneous intervention a year ago at an outside institution and seems to have not caused any mechanical problems to the valves and without any clinical consequences to the patient. The procedure was completed uneventfully and the patient was discharged home. CT for the PVI confirmed the ostial RCA stent protruding into the aorta (figure 3).

We would like to describe a rare finding of a stent protruding into the aorta. TEE imaging of the ostial stents has rarely been described in the literature.¹ The differential diagnosis will include vegetation, thrombus, artefact, lipoma, calcification, fibroelastoma, foreign body, intramural haematoma and aortic atheromatous disease.^{2,3} Aorto-ostial coronary artery lesions are more common in the right than the left coronary artery. Protrusion can happen immediately after the intervention or migration over a period of time.⁴ Approximately, 1 mm stent protrusion is suggested for management of aorto-ostial lesion. Complications from excessive stent protrusion include stent fracture, difficult reintervention of the coronary ostium, absence of struts re-endothelialisation, coronary cusp perforation, severe aortic insufficiency and pulmonary oedema.⁵⁻⁸

© BMJ Publishing Group Limited 2021. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Kalavakunta JK, Ponna PK, Randhawa AK, et al. *BMJ Case Rep* 2021;**14**:e243632. doi:10.1136/bcr-2021-243632

Learning points

- ▶ Stent protrusion from right coronary artery into the aorta is a diagnostic and interventional challenge. It can cause difficulty in subsequent interventions.
- ▶ Complications include acute perforation of the cusp, severe aortic insufficiency and pulmonary oedema.
- ▶ Protruding ostial stents are under increased strain. They are more likely to fracture and embolise into peripheral, cerebral circulation.

In our case, right coronary stent protruded 1.35 cm into the aorta immediately after the index procedure with longest duration (1 year) without causing clinical symptoms in the patient or structural damage to aorta or aortic valve. We will follow the patient closely as an outpatient and might consider using ostial flash balloon for apposition of protruding stent wall against aortic wall if complications were to arise.

Two complications of aorto-ostial stenting are protrusion of the stent into aorta and in-stent restenosis.⁹ Our patient did not have in-stent restenosis. If the protruding stent is causing mechanical complications and symptoms in the patient, it can be removed.⁶ However, it increases risk of restenosis and coronary artery occlusion due to damage to the intima.¹⁰ Thus, it is recommended to keep the stents intact if possible. If protruding part is causing damage to the aortic valve, trimming can be attempted without bending rest of the stent.¹⁰ Complications from protruding stent can also be prevented by flaring proximal stent struts against aortic wall with help of flash ostial balloon.¹¹

Contributors Dr. Agrawal and Dr. Kalvakunta rounded on the patient on the general cardiac floor. Dr. Agrawal and Dr. Kalvakunta performed TEE on the patient. Dr. Ponna helped with the literature search and writing up the case report. Dr. Randhawa helped with writing up the case report.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iDs

Jagadeesh K Kalvakunta <http://orcid.org/0000-0003-4635-4616>

Yashwant Agrawal <http://orcid.org/0000-0002-1352-583X>

REFERENCES

- 1 Silbiger JJ. Imaging of right coronary artery ostial stents by transesophageal echocardiography. *Echocardiography* 2009;26:967–9.
- 2 Corda DM, Dragstedt C, Allen GS, et al. Protruding coronary stent detected by transesophageal echocardiography changes surgical procedure. *Echocardiography* 2017;34:1385–7.
- 3 Lerner AB, Subramaniam B, Mahmood F, et al. An unusual echodensity in the ascending aorta: transesophageal echocardiographic visualization of a protruding coronary stent. *Anesth Analg* 2006;103:854–5.
- 4 Palabiyik M. 9 MM protruding left main coronary artery stent. *J Clin Exp Cardiol* 2020;11:663.
- 5 Kaluski E, Hendler A, Klapholz M. Pci of the right coronary artery via or under struts of stents protruding into the aorta. *J Invasive Cardiol* 2007;19:E207–9.
- 6 Quintana E, Mestres CA, Congiu S, et al. Delayed aortic regurgitation caused by a right coronary stent protruding into the aorta. *J Heart Valve Dis* 2009;18:717–9.
- 7 Veeranna V, Pradhan J, Ali M, et al. Complex intervention of an in-stent restenosis of ostial right coronary artery stent protruding into aortic sinus of Valsalva: a case report and brief review of the literature. *J Invasive Cardiol* 2009;21:E226–8.
- 8 Wintzer-Wehekind J, Larose E, Rodés-Cabau J, et al. Coronary stent protruding in the ascending aorta: multimodality imaging evaluation. *JACC Cardiovasc Interv* 2020;13:263–4.
- 9 Chetcuti SJ, Moscucci M. Double-wire technique for access into a protruding aorto-ostial stent for treatment of in-stent restenosis. *Catheter Cardiovasc Interv* 2004;62:214–7.
- 10 Nakamura M, Minakata K, Yamazaki K, et al. Aortic valve replacement in patients with protruding coronary artery stents. *J Cardiol Cases* 2014;10:213–5.
- 11 Waggoner T, Kovach R, George JC. Flaring of ostial coronary stent using flash ostial balloon for Aorto-Ostial coronary disease in a right coronary artery chronic total occlusion intervention. *Cathlabdigest* 2015;23:1.

Copyright 2021 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <https://www.bmj.com/company/products-services/rights-and-licensing/permissions/> BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

Customer Service

If you have any further queries about your subscription, please contact our customer services team on +44 (0) 207111 1105 or via email at support@bmj.com.

Visit casereports.bmj.com for more articles like this and to become a Fellow