IHJ Cardiovascular Case Reports (CVCR) 2 (2018) S75–S77

Contents lists available at ScienceDirect

IHJ Cardiovascular Case Reports (CVCR)

journal homepage: www.elsevier.com/locate/ihjccr

Cuspal dissection of aorta during percutaneous coronary intervention to left anterior descending artery managed successfully

Shilpa Jayaprakash*, A.C. Nagamani

Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bannerghatta Road, Bangalore, India

ARTICLE INFO

Article history:
Received 19 April 2018
Received in revised form
24 July 2018
Accepted 31 August 2018

Keywords:
Cuspal dissection
Complication of PCI
Ostial stenting

ABSTRACT

Cuspal dissection of aorta during cardiac interventions is rare. It can be asymptomatic or can cause life threatening complications. It can be managed by stenting the ostia of the involved coronary artery or may require surgical intervention when it is extensive.
© 2018 Cardiological Society of India. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Introduction

Cuspal dissection of aorta during cardiac catheterization is rare. It can be asymptomatic or sometimes can cause hemodynamic collapse requiring surgery. We report a case of cuspal dissection of left coronary cusp in a patient who underwent primary coronary intervention (PCI) to left anterior descending artery (LAD). (see Figs. 1a,1b,1c,1d, 2 and 3).

Case report

A 62-year-old female presented with history of chest pain for two days. Past history was significant for hypertension of 10 years duration managed on amlodipine 5 mg once daily. On examination, pulse was 82/minute, blood pressure (BP) was 160/80 mmHg in right upper limb. Cardiac examination was normal. ECG showed q waves in V1–V3 with ST segment elevation in V1–V6 and T wave inversion in V1–V6. Two dimensional echocardiogram showed regional wall motion abnormality involving basal and mid anterior septum, anterior and apical walls with left ventricular ejection fraction of 40%. Hemogram and biochemistry was done, which was normal except for low-density lipoprotein cholesterol 131mg/dl and high-density lipoprotein cholesterol 32mg/dl.

She was taken up for diagnostic coronary angiogram with the intention to revascularize, as she continued to have intermittent angina. Right femoral arterial approach coronary angiography (CAG) was done. Left main coronary artery (LMCA) was normal, LAD was type 3 vessel with proximal to mid long segment stenosis of 80–90%, distal vessel was normal. Left circumflex artery (LCX) was non-dominant and had no flow limiting disease, right coronary artery (RCA) was dominant and had no flow limiting disease. After discussion with patient and her family, we decided to do PCI to LAD using two stents. She was loaded with clopidogrel and aspirin and taken up for PCI. We decided to use 6F Judkins left guide with 3.5 curve and cannulating left main was not easy. LAD was wired using 0.014" floppy wire. Lesion was predilated using 2.5×10 semi compliant balloon. We decided to use two stents as length of the lesion was long. We took 2.5×28 drug eluting stent (DES) (Biomime Meril) distally and there was difficulty when the stent was being negotiated into the vessel. Guide catheter manipulation was done to facilitate stent placement. After confirming position, the distal stent was deployed at 12 atm. Post stenting shoot was taken, which revealed left coronary cuspal dissection with dye staining. However, dissection was confined to cusp and was not extending to LMCA. Patient was hemodynamically stable and had no complaints. We did a bedside echocardiogram, which showed no pericardial collection and no aortic regurgitation. We decided to deploy the proximal stent and reassess. We deployed 2.75×28 DES (Biomime Meril) overlapping with distal stent and covering ostium of LAD proximally at 12 atm. We postdilated both stents and overlapping area adequately with 2.75×10 noncompliant balloon at 18 atm. At this time, we could still visualize the dissection flap with dye

* Corresponding author. No 270, 2nd A main, 1st phase, Girinagar, Bangalore, 560085, India.
E-mail address: shilpajv@yahoo.co.in (S. Jayaprakash).

https://doi.org/10.1016/j.ihjccr.2018.08.016
2468-600X/© 2018 Cardiological Society of India. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Fig. 1A. AP cranial view post distal stent deployment showing dissection flap in left coronary cusp with dye staining.

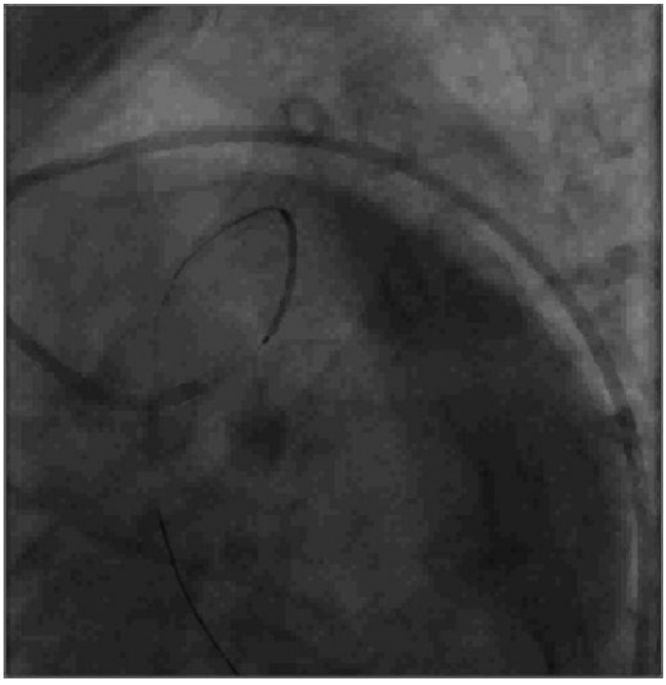

Fig. 1B. AP caudal view showing proximal stent positioning with dye staining in left coronary cusp.

Fig. 1C. AP cranial view showing dye staining in left coronary cusp.

Fig. 1D. LAO caudal view showing dissection flap in left coronary cusp with haziness in LMCA. LCX looks normal.

staining. As the dissection flap was close to LMCA ostium, we decided to stent ostium of LMCA to prevent progression of dissection into LMCA. We took 4×8 DES (Rapstrom Vasmed) and positioned it at LMCA ostium and deployed it at 14 atm. Post deployment, when the stent balloon was being withdrawn, we noticed that the stent also moved towards the guide and garlanded the guide. Immediately the stent balloon was inflated beyond the tip of the guide and whole system was withdrawn and the stent was left garlanding the right femoral sheath. In the meantime, we could not visualize the dissection flap in multiple views and it had spontaneously sealed. We decided to manage it conservatively and ended the procedure. Throughout the procedure, patient was hemodynamically stable and comfortable. We did computed tomographic aortogram next day, which showed no evidence of dissection. She is on regular follow-up and doing well.

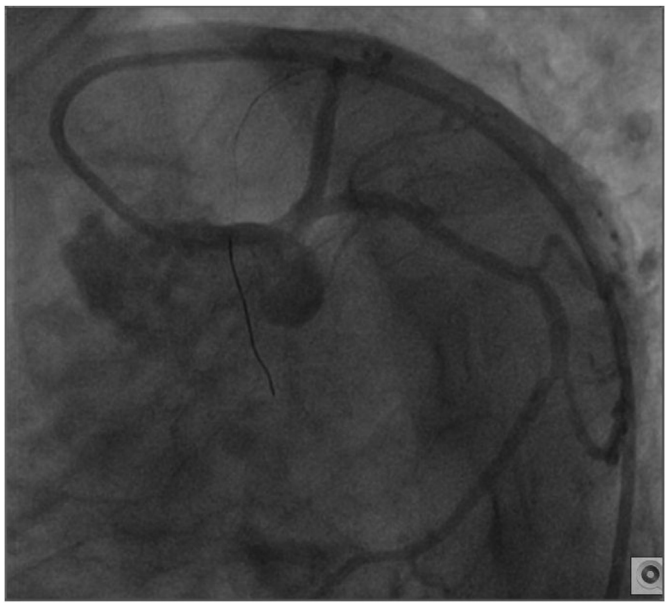

Fig. 2. LAO caudal view showing healed dissection flap with normal LMCA.

Fig. 3. CT aortogram at the level of aortic root showing no evidence of dissection flap in left coronary cusp.

Discussion

Acute aortic dissection during cardiac catheterization is a very rare complication with an overall incidence of 0.02%. It occurs more frequently in the emergency setting of acute myocardial infarction (0.19%) than in an elective setting (0.01%). The incidence is generally higher during PCI (overall 0.03%) than during diagnostic procedures (<0.01%) in elective settings.

Aorto-coronary dissection is quite rare. The overall incidence of catheter-induced coronary dissection remains unknown, but aorto-coronary dissection has been estimated to occur in approximately 0.008–0.02% of diagnostic catheterizations and 0.04–0.06% of PCIs.

Cause for the propagation of dissection and the occurrence of aortic dissection remains to be established. However, it appears that the entry point originates within the coronary dissection and subsequently leads to progressive retrograde extension of the subintimal space into the aortic root. It occurs following a trauma caused by the tip of the guiding or diagnostic catheter (due to unintended deep intubation), subintimal passage of the rigid guidewire, or because of balloon dilatation. With the advent of complex interventions such as revascularization of chronic total occlusions, left main stenting, ostial and bifurcation lesions and saphenous vein graft lesions, this complication may become more prevalent.

In our patient, we think it was due to manipulation of guide catheter during placement of distal stent which caused the dissection. In retrospect, we could have chosen a guide with better support like extra backup. Also, excessive manipulation of guide during stent placement could have been avoided. Stent balloon inflation can sometimes seal the dissection flap leading to spontaneous resolution.

Risk factors for dissection include hypertension, older age, extensive atherosclerosis with aortic root dilatation and underlying structural weakness of the media (cystic medial necrosis). Our patient was elderly hypertensive with mild aortic root dilatation.

Dunning and colleagues have classified aortocoronary dissection based upon the extent of aortic involvement: class I, contrast staining involves only the coronary cusp; class II, contrast extends up the aortic wall to <40 mm; and class III, contrast extends to >40 mm up the aortic wall. In their published case series, the extent of propagation of aortic dissection yielded prognostic information, with class III dissections having uniformly poor outcomes. This classification may be useful for risk stratification. The optimal treatment for this complication has not been established, but it has been recommended that cases of localized aortocoronary dissection not complicated by ischemia or hemodynamic instability can be treated with intracoronary stenting or conservative management. Class II and III will require surgical correction.

Conclusion

Cuspal dissection of aorta is a very rare complication of cardiac catheterization. It can be managed by stenting of the coronaries or by conservative management. Dissection flap extending beyond the cusp may cause hemodynamic collapse requiring emergency surgery. Our patient was fortunate to have a localized dissection, which healed spontaneously even though we attempted to stent LMCA.

Conflicts of interest

We have no conflicts of interest to declare.

We have no sources of research support, including funding, equipment, and drugs.