

Effectiveness of late coronary angioplasty in restoring sinus rhythm in inferior wall myocardial infarction with complete AV block

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Summary

An elderly gentleman presenting late with inferior wall myocardial infarction and complete heart block underwent revascularization of an occluded proximal right coronary artery more than four days after the onset of symptoms and recovered sinus rhythm within 48 hours of the procedure. There are no clear guidelines for time to percutaneous coronary intervention (PCI) in late presenting myocardial infarction with complete atrioventricular blocks (CAVB), and studies looking at outcomes of primary PCI in this situation appears to be scarce. The case presented here is a good example of the relevance of late PCI.

Background

Patients presenting with myocardial infarction and high grade AV blocks have worse outcomes, while early coronary interventions have shown improved results. Late revascularization outcomes however are not well documented with limited information available for guiding PCI in these situations with persisting complete heart blocks.

Case presentation

A gentleman in his early-sixties presented to a remote hospital elsewhere with a history of acute chest discomfort that was associated with light-headedness and shortness of breath. He is a chain smoker, non-diabetic and non-hypertensive. There was no prior cardiac history.

The electrocardiogram (ECG) showed inferior wall ST elevation myocardial infarction with complete AV block. He was hemodynamically stable with a heart rate of 30 to 35/mt and was referred to our centre for further management without any revascularization attempts. He arrived 24 hours later still in complete heart block with a heart rate ranging from 40 to 45/mt and persisting ST elevation (Fig. 1) with a blood pressure of 140/90 mmHg. A temporary pacemaker was inserted with a plan to do coronary angioplasty. However the patient became delirious and restless and did not allow the team to proceed. Since he was hemodynamically stable with no ongoing angina, it was decided to delay the procedure a little while.

While in the ward he became breathless and went into distress with low blood pressure despite adequate pacing. He was intubated by the on-call doctor, started on inotropes and shifted back to the cath lab for revascularization. The coronary angiogram showed a single vessel disease with a 100% proximally occluded right coronary artery (Fig. 2). Complete re-vascularisation of the vessel was achieved with two drug-eluting stents (Fig. 3) and over the next 36 to 48 hours he was slowly taken off inotropic support (noradrenaline). On the second post-procedure day he recovered sinus rhythm with a first degree heart block and a PR interval of 280 ms. He was extubated the same day and taken off temporary pacemaker support the following day. The patient was discharged two days later maintaining sinus rhythm and a much reduced PR interval of 204 ms (Fig 4). The echocardiogram showed a mild left ventricular systolic dysfunction with no other mechanical complications.

Outcome and follow-up

The patient was reviewed two weeks later with the ECG showing sinus rhythm and no evidence of atrioventricular conduction delay (Fig. 5). He reported no difficulty with routine activities. Compliance with medications has been good and he was advised to review after a month.

Discussion

Guidelines state that revascularization should be considered in late presenting MI's with high grade AV blocks (1), but clear recommendations for PCI time in these situations are lacking. Studies focusing on outcomes in these situations are limited with complete heart block being a bad prognostic marker even in the primary PCI era (2). In a retrospective study looking at AV block recovery following late PCI in inferior wall MI with high grade AV blocks (82% of them had CAVB), a median time to PCI of 4 days resulted in complete recovery of 1:1 AV conduction for all patients at discharge (3).

A similar case report by Liang et al (4) suggested that late coronary intervention in a patient presenting with IWMI complicated by complete heart block avoided a potential permanent pacemaker implant. However, In this case the AV block developed after presenting late to the hospital and complete revascularization was achieved within a short span of developing the conduction block.

The AV node tissue has been described as resistant to permanent damage due to its high intracellular glycogen content (5), unique blood supply involving adjacent septal perforators, and ability to absorb oxygen and nutrients from the neighbouring venous sinusoids (6). Conduction system abnormalities in acute posterior-inferior infarction are hence usually transient. However, it has been observed that those with persistence of such disturbance have more extensive damage to the conduction system involving the proximal as well as distal areas (7). It is in this group of patients with persistent high-grade AV blocks that revascularization, even if late, may result in good outcomes.

Learning points

Complete AV block in inferior wall myocardial infarction is a reversible complication despite late presentation.

Late revascularization of a completely occluded RCA should be attempted to potentially avoid permanent pacemaker implantation.

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