

## การรักษาโรคหลอดเลือดหัวใจผ่านสายสวนภายหลังการรักษาโรคกล้ามเนื้อหัวใจขาดเลือดเฉียบพลันด้วยยาละลายลิ่มเลือดในผู้ป่วยหัวใจด้านขวา

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### บทคัดย่อ

ผู้ป่วยที่มีหัวใจด้านขวาเป็นความผิดปกติที่พบน้อยมาก อุบัติการณ์โรคหลอดเลือดหัวใจในผู้ป่วยกลุ่มนี้ไม่แตกต่างกับประชากรทั่วไป การรักษาโรคหลอดเลือดหัวใจผ่านสายสวนในผู้ป่วยกลุ่มนี้อาจต้องใช้เทคนิคพิเศษ เช่น การตรวจรักษาหลอดเลือดด้วยภาพรังสีในมุมสะท้อนตรงข้าม การหมุนท่อสายสวนในทิศทางตรงข้ามปกติ ผู้นิพนธ์ได้รายงานการรักษาโรคหลอดเลือดหัวใจผ่านสายสวนภายหลังการรักษาโรคกล้ามเนื้อหัวใจขาดเลือดเฉียบพลันโดยการเปิดหลอดเลือดได้สำเร็จด้วยยาละลายลิ่มเลือดในผู้ป่วยหัวใจด้านขวา

**คำสำคัญ:** การขยายหลอดเลือดหัวใจด้วยบอลูน กล้ามเนื้อหัวใจขาดเลือดเฉียบพลัน หัวใจอยู่ขวา

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# Early percutaneous coronary intervention after successful fibrinolysis for acute myocardial infarction in a patient with dextrocardia

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## Abstract

Dextrocardia is an uncommon cardiac anomaly. The incidence of coronary artery disease in these individuals is not different from general population. Apart from standard percutaneous coronary intervention (PCI) procedure, some special technique should be considered, such as mirror image angiographic angulation, opposite-direction of catheters rotations. The authors describe a patient with dextrocardia who presented with ST-segment elevation myocardial infarction and was successfully treated with fibrinolysis and PCI as an early invasive strategy.

**Keywords:** coronary intervention, myocardial infarction, dextrocardia

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## Introduction

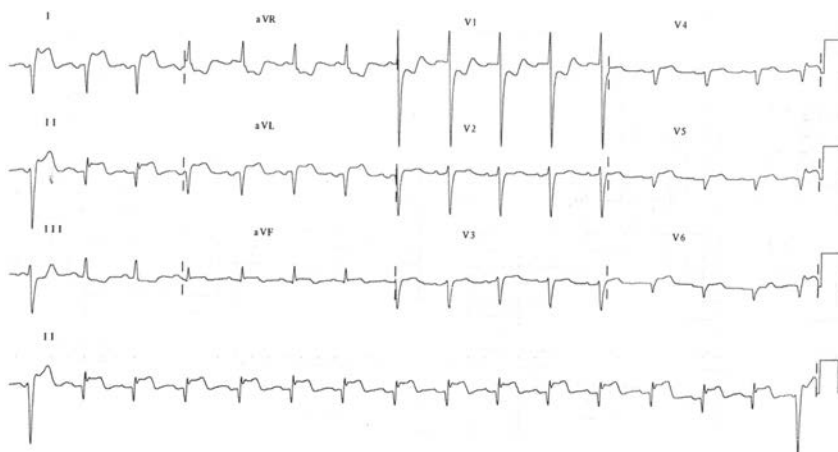
Dextrocardia is an uncommon cardiac anomaly. The incidence of coronary artery disease in these individuals is not different from general population. The coronary angiography and PCI require some technical modification. The authors describe a patient with dextrocardia who presented with ST-segment elevation myocardial infarction and was successfully treated with fibrinolysis and PCI as an early invasive strategy.

## Case Report

A 82-year-old woman with no prior medical history experienced acute retrosternal tightness which had worsened in severity over the preceding two hours. The patient was hemodynamically stable and the physical examination was unremarkable. Electrocardiography revealed an inverted P wave in I and aVL limb leads and an upright P wave and R wave in aVR limb lead, with

poor progression of R waves in the precordial leads, which were suggestive of dextrocardia. A ST-segment elevation in the inferior limb leads was suggestive of acute inferior wall myocardial infarction (Figure 1).

The patient was prescribed aspirin, clopidogrel and immediately received 1.5 million units of streptokinase, with good ST-segment resolution on the electrocardiography. The patient remained stable overnight and was transferred for early invasive strategy after successful fibrinolysis. Cardiac catheterization was performed via the right femoral artery using mirror-image views. The thoracic aorta was lying right to the sternum. The right-sided morphologic left coronary artery was engaged with the 6 French Judkins left (JL4) diagnostic catheter (Cordis, USA) without difficulty. The right anterior oblique (RAO) cranial view demonstrated moderate stenosis in the proximal segment of circumflex artery and severe stenosis in the mid segment of left



**Figure 1** Electrocardiography of standard limb and precordial leads was suggestive of dextrocardia and inferior wall myocardial infarction

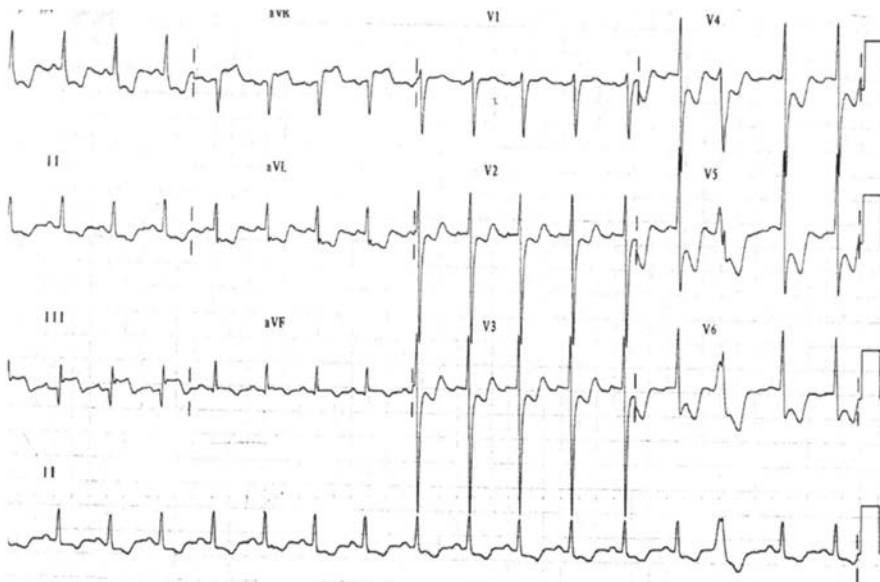
anterior descending artery (LAD) (Figure 3).

The left-sided morphologic right coronary artery (RCA) was engaged with counter-clockwise rotation of 6 French Judkins right (JR4) diagnostic catheter (Cordis, USA). There was initial difficulty in localizing the right coronary ostium. It was selectively cannulated in the RAO view. Right coronary angiography demonstrated severe stenosis in the mid segment from RAO and left anterior oblique (LAO) views (Figure 4,6).

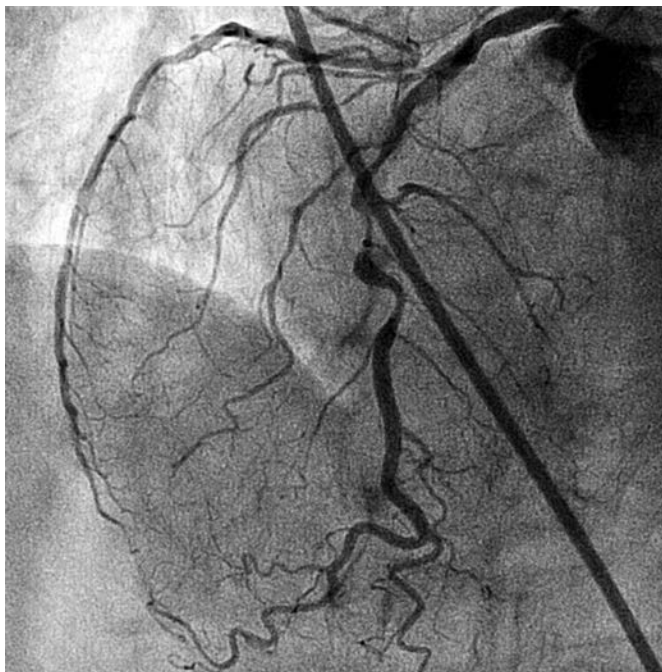
Heparin (3,500 units) was administered peripherally. A 6 French JR4 guide catheter was engaged into the right coronary ostium, as described in the diagnostic procedure. The mid-RCA lesion was dilated. A 3.0-14 mm BioFreedom drug-coated stent(Biosensors,

Singapore) was deployed. Stent post-dilatation was performed using a 3.0-15 mm non-compliant Trek balloon (Abbott Laboratories, USA) with the pressure of 20 atmospheres resulting in Thrombolysis in Myocardial Infarction (TIMI) grade III flow (Figure 5,7).

The total fluoroscopy time of the procedure was 13 minutes. Intervention to LAD lesion was planned in a second procedure. Echocardiography revealed situs inversus and dextrocardia, inferior wall hypokinesia and a left ventricular ejection fraction of 0.45.The patient had an uneventful recovery and was discharged two days later on dual anti-platelet therapy and remains symptom free at 30-day follow-up.



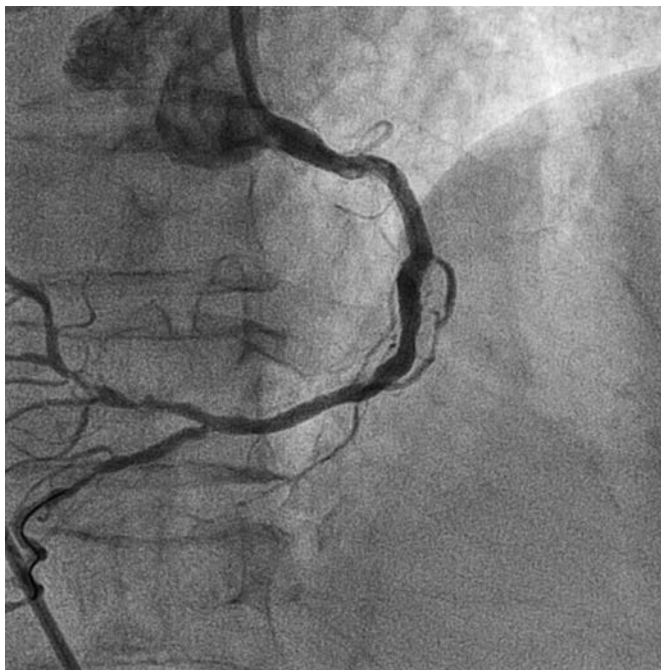
**Figure 2** Electrocardiography of limb and precordial lead reversal showed the ST-segment elevation of inferior leads which was not affected by the presence or absence of mirror-image dextrocardia



**Figure 3** Left coronary angiography with a JL4, 6 Fr. catheter in a RAO cranial view demonstrated moderate stenosis in the proximal segment of circumflex artery and severe stenosis in the mid segment of left anterior descending artery



**Figure 4** Right coronary angiography demonstrated severe stenosis in the mid segment from RAO view



**Figure 5** Right coronary artery post-stent implantation in RAO view



**Figure 6** Right coronary angiography demonstrated severe stenosis in the mid segment from LAO view





**Figure 7** Right coronary artery post-stent implantation in LAO view

## Discussion

Situs inversus with dextrocardia is an uncommon congenital anomaly and presents in approximately one per 10,000 individuals<sup>1</sup>. The occurrence of congenital heart disease among these individuals is estimated to be approximately 3%<sup>2</sup>. Thus, most patients with this anomaly have a normal life expectancy and the risk of coronary artery disease is, therefore, similar to the general population<sup>3</sup>. The patient was not aware of her dextrocardia until this admission, and interestingly the pain was located in the retrosternal region with no radiation. The chest pain is usually located on the right side or radiates to right arm in the patients with dextrocardia<sup>3-7</sup>. The diagnosis of myocardial infarction in such patients could be difficult unless dextrocardia is timely

recognized. In the current patient, ST-segment elevation in the inferior leads was not affected by the presence or absence of mirror-image dextrocardia (Figure 2).

To facilitate correct interpretation of the site and the extent of the infarction and related culprit vessel, a second normalized electrocardiography should be performed with the limb and precordial lead reversal.

In the first reported case of PCI in dextrocardia with situs inversus, Moreyra et al. found the regular coronary catheters (Judkins) difficult to use because of the reversed position of the coronary ostium, and recommended multipurpose catheter or a brachial approach<sup>8</sup>. It has since been suggested that the suitability of diagnostic and guide catheters can be predicted by the aortic arch

position<sup>9-10</sup>. There have been several reports of primary PCI for inferior wall myocardial infarction in the patients with dextrocardia<sup>6,7,11,12</sup>.

The patient had a right-sided aortic arch, the right-sided morphologic left coronary artery could be successfully engaged with a JL catheter manipulated to a mirror image of its usual position. Similarly, left-sided morphologic RCA was engaged with a JR catheter, catheter of which was manipulated to a mirror image of its usual position. The catheters could be passed using the standard technique in mirror-image positions. The selective cannulation of the RCA might be difficult for which the operator is not accustomed and also has to rotate the catheter counter-clockwise in the aorta, in contrast to the routine clockwise rotation for cannulation of the RCA<sup>13</sup>. It should be noted that for both the right and the left coronary arteries in biplane angiography, the LAO and RAO angulations are essentially reversed from the normal biplane angulations. The selective left coronary angiograms were obtained in the RAO cranial, posteroanterior cranial, and LAO caudal views. The selective right coronary angiograms were obtained in the RAO, posteroanterior cranial, and LAO views. For intervention to the RCA, the RAO and LAO view provided excellent imaging.

### Conclusion

The authors report the first case of PCI as an early invasive strategy after successful fibrinolysis for the treatment of ST-segment elevation myocardial infarction in a patient with dextrocardia. The use of Judkins catheters,

standard image acquisition, and counter-clockwise rotation of catheters allowed the interventional procedure to proceed without any complication.

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