Image Diagnosis: Multivessel Percutaneous Coronary Intervention in Dextrocardia: Success with Usual Techniques in a Case of Mirror-Image Heart

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CASE PRESENTATION

A 59-year-old man with an unremarkable medical history except for tobacco abuse presented to our hospital with chest pain, dyspnea, orthopnea, and edema. His physical examination was notable for jugular venous distention, distant heart sounds, and bilateral pitting lower-extremity edema.

An electrocardiogram showed negative P waves in leads I and aVL, reversed R wave progression across the anterior leads, and Q waves in leads II, III, and aVF (Figure 1). A chest radiograph demonstrated dextrocardia with a right-sided stomach bubble, indicating situs inversus (SI) totalis (Figure 2). The patient's troponin I level was elevated to 2 ng/mL (normal value, < 0.04 ng/mL). He was started on optimized medical treatment for acute coronary syndrome, which included anticoagulation in the form of heparin and starting on aspirin and prasugrel, as well as a beta blocker. A transthoracic echocardiogram showed severely depressed left ventricular systolic function with ejection fraction of 10% to 20% and global hypokinesis.

Our patient underwent left heart catheterization through the left common femoral artery approach. A Judkins JL4 catheter (Cordis Corporation, Hialeah, FL) was used to engage the right-sided anatomically located left main coronary artery. Engagement was successful with clockwise rotation of the catheter. This rotation revealed 90% stenosis in the mid left anterior descending artery (Figure 3). The right coronary artery was engaged successfully using a Judkins JR4 catheter with counterclockwise rotation. This revealed 95% stenosis in the mid vessel (Figure 4). Using an XB 3.5 catheter guide (Medtronic, Minneapolis, MN) and a balance middleweight guidewire (Abbott Industries, Abbott Park, IL), the left anterior descending lesion was crossed, and a drug-eluting stent was successfully placed. Then, a 6-French JR4 catheter guide (Abbott Industries, Abbott Park, IL) was used for right coronary artery engagement.

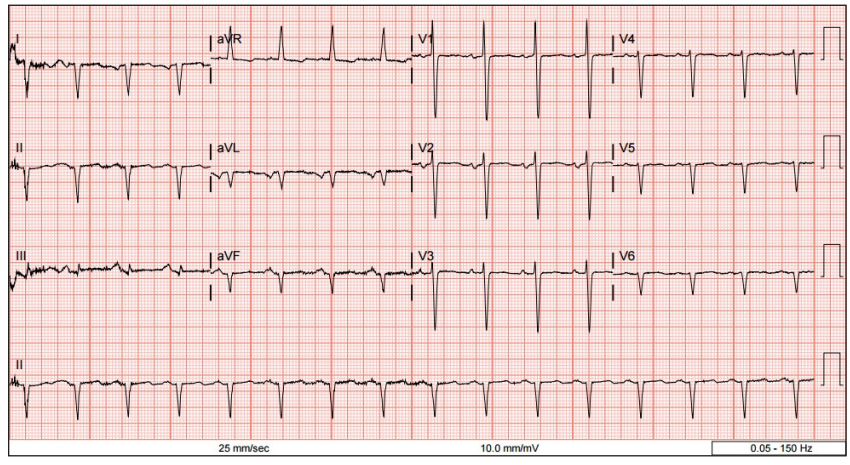

Figure 1. Electrocardiogram showing negative P waves in leads I and aVL, reversed R wave progression across the anterior leads, and Q waves in leads II, III, and aVF.

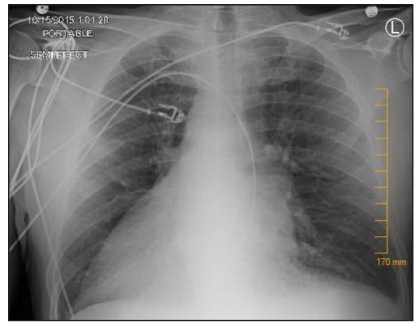

Figure 2. Chest radiograph demonstrating dextrocardia with a right-sided stomach bubble, indicating situs inversus totalis.

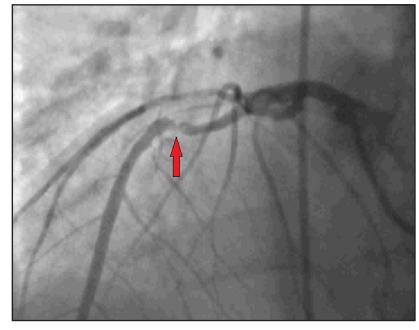

Figure 3. Angiogram revealing stenosis in the mid left anterior descending artery.

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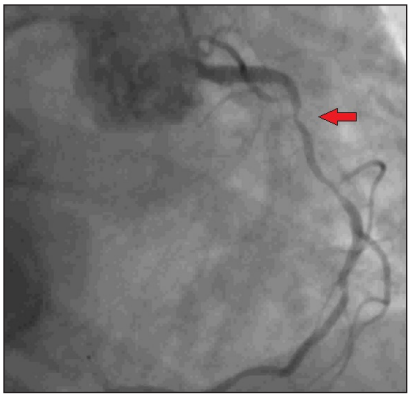

Figure 4. Angiogram revealing stenosis in the mid vessel of the right coronary artery.

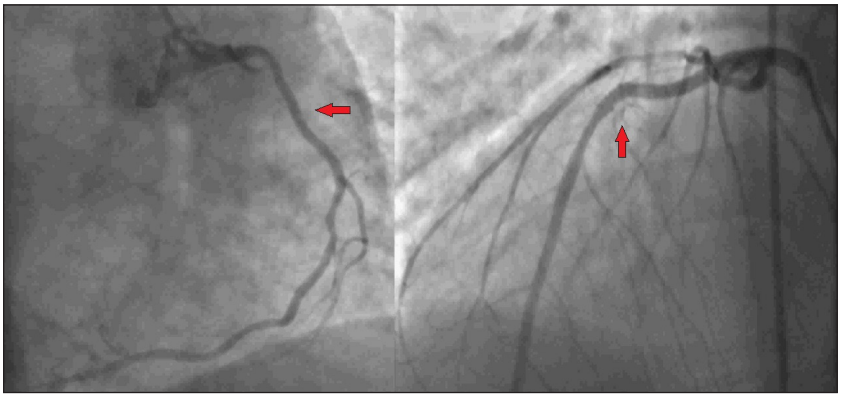

Figure 5. Postprocedure angiogram showing no evidence of stenosis.

A balance middleweight guidewire was used to cross the lesion, and a drug-eluting stent was again successfully placed. A final angiogram showed excellent angiographic results (Figure 5).

The patient was discharged after 48 hours on medical management for coronary artery disease that included dual antiplatelet therapy with aspirin and prasugrel. He continued to take beta blockers and statins, which were initiated at presentation.

At 1-month follow-up, our patient was feeling much better, with no symptoms of chest pain or shortness of breath. A repeat echocardiogram 2 months later revealed improvement of left ventricular systolic function, with an ejection fraction of 40% to 45%. He was continued on medical therapy for coronary artery disease and optimized guideline-directed medical therapy for congestive heart failure, which included a beta blocker and an angiotensin-converting enzyme inhibitor.

DISCUSSION

SI is a rare medical condition that presents as a complete reversal of the internal organs, including circulatory and gastrointestinal systems. It can present with or without Kartagener syndrome.[1] Kartagener syndrome also involves primary ciliary dyskinesia.[1] SI presenting without Kartagener syndrome, as in our case, has a widely accepted prevalence of 1:10,000, as reported by Torgersen[1] in 1947. SI presenting without Kartagener syndrome does not cause abnormality in health condition, so the majority of patients can go completely undetected until a medical workup is done, such as an electrocardiogram or chest x-ray.[2]

Percutaneous coronary intervention in patients with dextrocardia can be challenging, because there is no consensus regarding diagnostic and interventional catheters choice, coronary engaging techniques, or choosing best radiologic views and angles.[3] After thorough review of the literature, we found only scarce reports describing multivessel percutaneous coronary intervention in dextrocardia patients in the same setting.[4,5] We searched the literature via MEDLINE and PubMed, using the terms "dextrocardia," "acute coronary syndrome," and "percutaneous intervention." In our case, we report a successful single-stage multivessel percutaneous coronary intervention in SI dextrocardia using a transfemoral approach in the setting of acute coronary syndrome.

CONCLUSION

Dextrocardia is a very rare condition and is usually an incidental finding in healthy individuals. However, it could be clinically noted in a variety of cardiovascular and noncardiovascular conditions. Patients with dextrocardia can have various clinical presentations, including acute coronary syndrome and congestive heart failure. Successful diagnostic catheterization and multivessel intervention can be achieved through conventional catheters with appropriate reversed rotation and without need for right/left reversal of radiologic views.[3-5] ❖

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

How to Cite this Article

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