

Off Pump CABG in a Case of Dextrocardia with Situs Inversus Totalis

Trivedi JK

General Surgery, Cardiothoracic and Vascular Surgeon in Arilova, Visakhapatnam, Andhra Pradesh, India

ABSTRACT

Dextrocardia with *Situs Inversus Totalis* is a rare congenital abnormality with an incidence of 1:10000. The incidence of coronary artery disease is the same as that in the general population. Performing coronary artery bypass surgery on patients with Dextrocardia poses a more challenging task and requires some modifications and adjustments. It is recommended that the right internal mammary artery be the first choice of graft for the anterior descending artery for a "*Situs Inversus*" situation. We present a case of 60 years female who presented to us with breathlessness on mild exertion and was found to have Dextrocardia with *Situs Inversus Totalis* and was diagnosed to have CAD with double vessel disease and underwent successful off pump coronary artery bypass grafting.

INTRODUCTION

Dextrocardia with *Situs Inversus Totalis* [1] is a rare congenital abnormality with an incidence of 1:10000. The incidence of coronary artery disease is the same as that in the general population [2-3]. Performing coronary artery bypass surgery on patients with Dextrocardia poses a more challenging task and requires some modifications and adjustments. It is recommended that the right internal mammary artery be the first choice of graft for the anterior descending artery for a "*Situs Inversus*" situation. We present a case of 60 years female who presented to us with breathlessness on mild exertion and was found to have Dextrocardia with *Situs Inversus Totalis* and was diagnosed to have CAD with double vessel disease and underwent successful off pump coronary artery bypass grafting.

Case report: 60 years old lady was evaluated for breathlessness on mild exertion. Her Xray chest suggested Dextrocardia and ultrasound abdomen confirmed *Situs Inversus Totalis*. Her echocardiogram suggested severe LV dysfunction with anterior and lateral wall hypokinesia and regional wall motion abnormality of whole of LAD (Left anterior descending) territory. She subsequently underwent coronary angiogram which showed completely occluded LAD with retrograde filling from right side. Her Ramus branch was also 90% block. She successfully underwent off pump CABG with minor adjustments by surgeon. Surgeon went on left side of patient and harvested RIMA (Right internal mammary artery) and from left side only did grafting RIMA to LAD and a vein graft to ramus following same steps as on usual CABG but from left side. Patient did well and was discharged on 6th post operative day and is on regular follow-up with us. Dis-

ussion: Performing coronary artery bypass surgery on patients with Dextrocardia poses a greater challenge compared to in patients with conventional positioning of the heart on the left. It is recommended that the right internal mammary artery be the first choice of graft for the anterior descending artery for a "*Situs Inversus*" situation. Dextrocardia was the first of the cardiac malpositions described by Fabricius [4] in 1606. The first coronary artery bypass graft in Dextrocardia was performed in 1980 [5]. We performed the surgery by the off-pump technique using the right internal mammary artery to the anterior descending artery, and there is one more report of performing the coronary artery bypass grafting by the off pump technique in a patient with Dextrocardia using both mammary arteries. Surgery poses extra problems, even if the surgeon stands on the left side of the operating table; technically it is more difficult for a right-handed surgeon. In our experience with this case, our operating time was slightly more prolonged than usual; however, performing surgery on the pump may pose more technical problems with caval cannulation, retrograde cardioplegia cannulation, and other cannulations. Dextrocardia can occur as an isolated abnormality, although this is rare in adults who present for CABG: most reports in this surgical context mention Dextrocardia that is associated with *SI totalis*. Cardiac anomalies in association with *SI totalis* are rare, whereas anomalies with isolated Dextrocardia are common

PREOPERATIVE EVALUATION

The standard preoperative evaluation of CABG patients with Dextrocardia includes clinical examination, ECG, chest radiography, TTE, and coronary angiography. Clinical examination reveals a right-sided cardiac apex with a left-sided liver in the

Correspondence to: Trivedi JK, General Surgery, Cardiothoracic and Vascular Surgeon in Arilova, Visakhapatnam, Andhra Pradesh, India

Received: January 04, 2021; **Accepted:** January 18, 2021; **Published:** January 25, 2021

Citation: Trivedi JK (2021) Off Pump CABG in a Case of Dextrocardia with *Situs Inversus Totalis*. *Surgery Curr Res*. 11:2.

Copyright: © 2021 Trivedi JK. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

presence of SI totalis. If the main symptomatic lesion is within the region of the LAD, chest pain may be reported as anterior-right-sided. The ECG typically shows features of mirror-image Dextrocardia, with low voltages in conventionally placed anterolateral chest leads. Inverted P waves in lead I are also typical in Dextrocardia with SI. Particular care should be taken with ECG interpretation during attempts to identify the area of myocardium that is involved in acute coronary syndromes in patients with Dextrocardia, because of the abnormal position of the heart relative to conventional ECG lead positions. Results of chest radiography confirm the position of the heart and may reveal an inverted main bronchus branch pattern, as well as a gastric air bubble beneath the right hemidiaphragm. A detailed TTE enables definition of the atrial situs and the concordance of atrioventricular (AV) and ventriculoarterial (VA) connections. Normal systemic and pulmonary venous drainage should be confirmed, and a search for intracardiac shunts should be performed. In addition, coronary artery anomalies may be seen on TTE.

Coronary angiography in patients with Dextrocardia requires only minor modifications to catheter-insertion technique and in the interpretation of projections. Successful percutaneous coronary intervention has been performed in patients with coronary artery disease and Dextrocardia.

Important surgical adjustments

Cannulation for Cardiopulmonary Bypass: In preparation for cannulation for CPB, attention should be given to the location of the aortic arch, which may be right-sided in patients with Dextrocardia. In SI and Dextrocardia, the ascending aorta is behind and to the left of the pulmonary trunk. If bicaval cannulation is required, the presence of bilateral superior vena cavae (SVCs) may influence the cannulation approach. An additional SVC draining to the coronary sinus is also relevant if retrograde cardioplegia is being considered for myocardial protection in OPCAB cases. One case has been reported of a CABG patient who had a single left SVC, albeit with situs solitus and levocardia. Situs solitus in Dextrocardia makes access to the right atrial appendage difficult to attain. In the rare instance of left atrial isomerism, the inferior vena cava (IVC) may drain into a left SVC, as is discussed below. In right atrial isomerism, there may be anomalous pulmonary venous drainage, and in both types of situs ambiguus, the atrial septum may be incompletely formed. Furthermore, although the

situation is not described in regard to adult patients with Dextrocardia who need CABG, adults may present with atrial septal defects. These defects should probably be closed at the time of CABG. This would warrant CPB and bicaval cannulation with caval snares.

Exposure of Surgical Targets: The exposure of surgical targets for CABG in Dextrocardia patients may be difficult with a conventional operative arrangement. Most reported operations were performed while the surgeon stood on the left side of the operating table. This position facilitates grafting to vessels in both coronary artery distributions and particularly to the circumflex region, which is exposed by retracting the heart toward the surgeon on the left side of the table. The LAD anastomosis can probably be performed with similar ease from either side of the table. Because the right ventricle (RV) is on the left and anterior to the LV, exposure of the right coronary branches is perhaps easier from the left side. If the surgeon stands on the left side, the position of the stabilizer/retractor device for OPCAB grafting may also need to be modified.

CONCLUSION

Dextrocardia with Situs Inversus Totalis is a rare condition and off pump CABG is more technically difficult in such situation but can be successfully done with some minor adjustments and modifications by surgeon.

REFERENCES

1. Rosenberg HN, Rosenberg IN. Martindale. Simultaneous association of Situs inversus, coronary artery disease and hiatus hernia. *Ann Intern Med.* 1949; 30: 851-859.
2. Hynes KM, Gau GT, Titus JL. Coronary Heart Disease in Situs Inversus Totalis. *Am J Cardiol.* 1973; 31: 666-669.
3. Ptashkin D, Stein E, Warbasse JR. Congenital Dextrocardia with anterior wall Myocardial Infarction. *Am Heart J.* 1967; 74: 263-7.
4. Cleveland M. Situs Inversus Viscerum: Anatomic Study. *Arch Surg.* 1926; 13: 343.
5. Irvin RG, Ballanger JF. Coronary Artery Bypass Grafting in patient with Situs Inversus. *Chest.* 1982; 81: 380-1.