

Coronary Artery Bypass Grafting in Dextrocardia. Is There A Challenge?

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2. Key words

Dextrocardia; coronary artery disease; situs inversus; coronary artery bypass grafting; renal failure

1. Abstract

Dextrocardia with situs inversus is a rare congenital condition, even though known since 1606 when Fabricious first described it. The incidence of coronary artery disease in this group of patients is the same as in general population.

First Coronary Artery Bypass Grafting (CABG) in patient with Dextrocardia was performed in 1980. Performing the procedure it is a very challenging task for the surgeon in the terms of planning, choice of conduits, and simultaneous presentation of other congenital conditions. We present a fifty-eight year old, insulin dependent diabetic, hypertensive male on end stage of renal failure, on waiting list for renal transplantation, who found to have severe coronary artery disease on a background of Dextrocardia. The whole procedure was performed under cardiopulmonary bypass with surgeon on the left side of the patient, using the right internal thoracic artery and two vein grafts as conduits. Patient had an unremarkable postoperative course and was discharged on day four postoperatively. His postoperative follow-up was satisfactory and patient is waiting for his renal transplant. Patients with congenital disorders have better survival and cases of ischaemic heart disease on a background of congenital disease will eventually become more frequent. Careful planning of the operation and very good understanding of patho physiology and the anatomy of those patients, are essential for a good outcome.

3. Background

Dextrocardia with situs inversus is a rare congenital abnormality with overall incidence of approximately 1/10,000 patients¹. It is secondary to a rotation of the visceral organs happened during evolution. First described by Fabricious in 1606² and then by Severinus in 1643², as part of situs inversus totalis with mirror-image. There are some cases described, where Dextrocardia was acquired (pseudodextrocardia). There is no difference in developing coronary artery disease comparing to the normal population³. The first coronary artery bypass graft in patient with Dextrocardia was performed in 1980⁴. Performing coronary artery bypass grafting on patients with Dextrocardia is a challenging task. There are only a few case reports of myocardial revascularization in such patients in the literature⁵.

4. Case report

We present a case of a 58 year old insulin dependent diabetic and hypertensive male in chronic renal failure. He is on dialysis. He has been on renal transplant list and most recent investigations in view for fitness for transplantation revealed that he has got important coronary artery disease on a background of Dextrocardia as a part of situs inversus. The lesions were as follow: important stenosis in the proximal Left Anterior Descending coronary artery (LAD), flow limiting stenosis in the proximal circumflex artery and stenosis in the mid and distal right coronary artery with preserved left ventricular function (**Figure 1,2**). In view of the renal transplant list and coronary artery disease, he consented to proceed with coronary artery bypass grafting on prognostic grounds with a EUROSCORE quote of mortality 1% and risk of stroke 2%. The on table transoesophageal echocardiogram

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confirmed situs inversus, Dextrocardia, preserved ventricular function, and no valvular abnormalities. Right pedicled internal mammary artery was anastomosed to LAD and two vein grafts to posterior descending artery (PDA) and first Obtuse Marginal branch of circumflex artery (OM1) respectively. The whole operation was performed under cardiopulmonary bypass with the surgeon positioned at the left side of the patient. Bypass and aortic clamp time were no different than those of a normal individual. The patient was discharged on day four (4), as his postoperative course was uneventful. During his hospitalization he had his routine haemodialysis course without any incidents. Patient was seen in outpatient department and his progress was satisfactory.

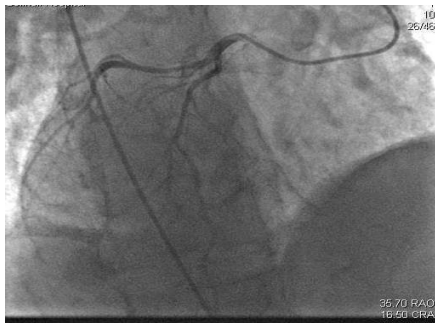


Figure 1: Left system of coronary arteries (RAO view)



Figure 2: Right Coronary Artery (RAO view)

5. Discussion

Performing a coronary artery bypass grafting in a patient with situs inversus totalis is challenging. Part from position of the surgeon there are multiple arrangements that need to be done, so you can perform the operation safely. The preparation of bypass, the exposure of the targets, the choice of conduits, the graft configu-

ration and finally other rare anatomical conditions that might be present are the most important steps that most considered when planning the procedure. Before cannulation it is crucial to identify the location and the orientation of aortic arch, which could be behind the pulmonary trunk. Cases of additional Superior Vena Cava (SVC), or SVC to drain into coronary sinus or inferior vena cava to drain to SVC were described. Also defects of the septum might be present and need to be fixed during the case. Other potential problems could arise from the pulmonary drainage or the atrioventricular anatomic relationships.

6. Conclusions

Patients with congenital disorders have now better survival and cases of ischaemic heart disease on a background of Dextrocardia will eventually become more frequent. Careful planning of the operation and very good understanding of pathophysiology and the anatomy of those patients, are essential for a good outcome.

References

1. Rosenberg HN, Rosenberg IN. Simultaneous association of situs inversus, coronary artery disease and hiatus hernia. *Ann Intern Med.* 1949;30(4):851-9.
2. Cleveland M. Situs inversus viscerum: anatomic study. *Arch Surg.* 1926;13:343.
3. Hynes KM, Gau GT, Titus JL. Coronary heart disease in situs inversus totalis. *Am J Cardiol.* 1973;31:666-9.
4. Bonde P, Campalani GF. Myocardial revascularization for situs inversus totalis and dextrocardia. *Interact CardioVasc Thorac Surg.* 2003;2(4):486-8.
5. Erdil N, Cetin L, Sener E, Demirkiliç U, Sağ C. Situs inversus and coronary artery disease. *Asian Cardiovasc Thorac Ann.* 2002;10(1):53-4.