

CABG in a Patient with Dextrocardia and Situs Inversus

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Abstract

A 59 year old man present with an acute ST-elevation myocardial infarction. The Gentleman was known to have dextrocardia and situs inversus. Due to his anatomy the Gentleman was not suitable for percutaneous intervention, he required a coronary artery bypass graft operation.

Due to the location of this Gentleman's heart the right internal mammary artery, rather than the traditionally used left internal mammary artery, was used for grafting the left anterior descending coronary artery. This alteration necessitated a change to the theatre set up and the surgeon's normal positioning.

The Gentleman's grafts were successful. He recovered well and was discharged from hospital on the fifth post-operative day.

Keywords: CABG; Dextrocardia; Azar Hussain

Introduction

Dextrocardia, a condition where the heart lies to the right hand side of the chest [1], occurs with an incidence of 1 in 12,000 [2]. Dextrocardia with true situs inversus is less common, though the true incidence rate is not currently known [3]. This phenomenon presents certain surgical challenges due to the unusual anatomy. In elective surgeries there is time to plan how these difficulties will be overcome, however in emergency or urgent surgeries there is less time to prepare. One instance where this challenge is particularly relevant is myocardial revascularisation. The altered anatomy found in these patients means that standard protocols are not suitable, and an adapted plan is required.

We present the case of a 59 year old gentleman with known dextrocardia and situs inversus who presented with an acute STEMI.

Presentation

A 59 year old gentlemen presented to a secondary centre with right arm and right sided chest pain. Electrocardiogram showed ST segment elevation in V2 and V3, indicating an anterior ST-elevation myocardial infarction. The gentleman has known dextrocardia and situs inversus. The patient has a previous diagnosis of Type 2 diabetes, and has previously undergone cholecystectomy and gastric surgery. The patient was transferred to a tertiary centre as a candidate for primary Percutaneous coronary intervention (PCI).

Investigations

Coronary angiogram demonstrated tubular stenosis in the Left Main Stem, the Left Anterior Descending artery had 80% occlusion proximally and 70% in the mid-section. The Left circumflex had 95% stenosis at obtuse marginal 2. The Right Coronary Artery had 70%

ostial occlusion, and 80% occlusion of the mid-section.

The echo showed that there was good LVSF.

Management

Due to the patient’s anatomy, demonstrated in figure 1, and the diffuse nature of his disease, it was determined that PCI would not be the preferred management option. Following MDT discussion, it was decided that the best management option would be surgical revascularisation.

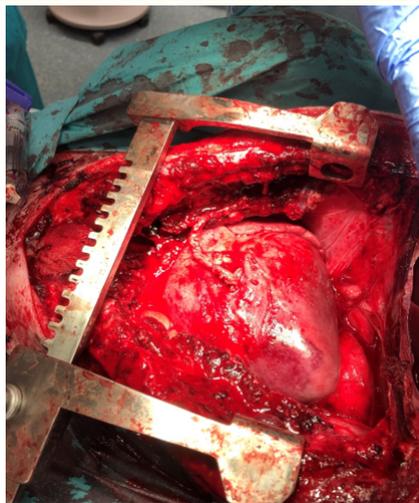


Figure 1: The Patient’s Chest has Been Opened via Sternotomy and the heart can be seen Lying to the Right Hand Side of the Chest Cavity.

The patient underwent a successful triple coronary artery bypass operation via midline sternotomy. The left great saphenous vein was harvested, and segments were grafted onto the first obtuse marginal branch and onto the diagonal artery. Due to the dextrocardia, the Right Internal Mammmary Artery was used to graft onto the Left Anterior Descending Artery, see figure 2. The Right Coronary and Posterior descending Arteries were considered too small to graft.

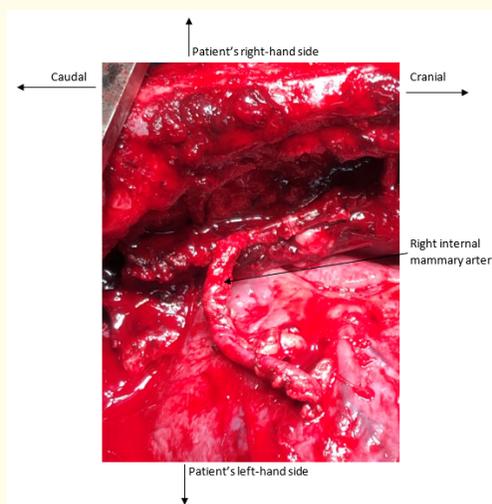


Figure 2: An Intraoperative Image Demonstrating the Right Internal Mammmary Artery (RIMA), Having Been Dissected off the Thoracic wall and Grafted on to the Left Anterior Descending Artery.

The patient came off bypass with ease and had a satisfactory post-operative Transoesophageal Echo. The patient had a smooth post-operative course and was discharged from the intensive treatment unit on the first post-operative day, and from hospital on the 5th post-operative day.

Conclusion

Dextrocardia is seen in 1/12,000 patients [2], and situs inversus in 1 in 10,000 [4]. Given the high volume of CABG procedures carried out yearly, 62 per 100,000 in Western Europe [5], it is not unlikely that there will be a number of CABG patients dextrocardia.

Operating on patients with dextrocardia presents numerous challenges. The theatre set up differs from that of a CABG performed on a left sided heart. The surgeon often stands on the opposite side of the patient to normal resulting in unfamiliar working practice [6].

In addition to the logistical challenges, dextrocardia presents an anatomical challenge. Whilst the Left Internal Mammary Artery (LIMA) is typically used to revascularise the Left anterior descending branch, it was not possible to use it in this case. The unusual location of the heart meant that the LIMA was not long enough to reach the LAD. To combat this issue the Right Internal Mammary Artery (RIMA) was used instead.

There are multiple reports of CABG procedures being carried out on patients with dextrocardia, with a number of different challenges identified. Despite this, the European Association for Cardiothoracic Surgery guidelines do not contain any guidance surrounding the issue [7].

As the number of revascularisation procedure is continually increasing, the likelihood of cases such as this one is also increasing. As such it may be pertinent to produce a guideline for this atypical procedure.

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