

Case Report

Detection of Intraoperative Aortic Dissection

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During coronary artery bypass grafting, epiaortic ultrasound examination utilizing the Medistim L15 ultrasound imaging probe demonstrated an ascending aortic dissection. The probe was useful in early detection and evaluation of the extent of the dissection.

Case

An 85 year old active female presented for coronary artery bypass grafting (CABG) surgery with severe three vessel Coronary Artery Disease (CAD) and unstable angina following.

History

The patient was very active for her age. She presented to the hospital with symptoms of increasing angina in the weeks prior to this episode. At the time of presentation she had experienced increased chest pain throughout the day. Her Troponin levels were elevated and consistent with a non-ST elevation myocardial infarction. Cardiac catheterization revealed severe proximal three vessel disease and the patient was prepared for CABG surgery.

Procedure

The patient underwent a CABG operation four days after catheterization. A median sternotomy was performed and epiaortic scanning was done utilizing the Medistim L15 imaging probe. The ascending aorta was normal in appearance and free of atheromatous disease. Saphenous vein had been harvested via the endoscopic technique. The patient was placed on cardiopulmonary bypass via the ascending aorta and right atrium. A Crafoord clamp was placed on the ascending aorta. Cardioplegia and venting were carried out through the ascending aorta utilizing a 12 gauge, 3 inch Angio-Cath. A four vessel CABG procedure under a single cross clamp was completed using the left internal mammary artery (LIMA) graft to the left anterior descending artery (LAD), and a saphenous vein graft (SVG) to the first and second obtuse marginal (OM) branches sequentially. The third graft was completed using the SVG to the main right coronary artery (RCA). Two proximal aortotomy incisions were performed for the proximal anastomoses. The cross clamp was removed, the graft was de-aired, and the patient was weaned from bypass without any inotropic support or other problems. Upon completion of the grafts, transit time flow measurements (TTFM) were made verifying patent results. The venous cannula was removed and Protamine was administered in the ascending aorta with a 19 gauge butterfly needle. The systemic pressure was then lowered to 80mm Hg systolic and the aortic cannula was removed. A purse-string suture was tied and then oversewn with 3-0 Prolene suture to close the cannula incision.

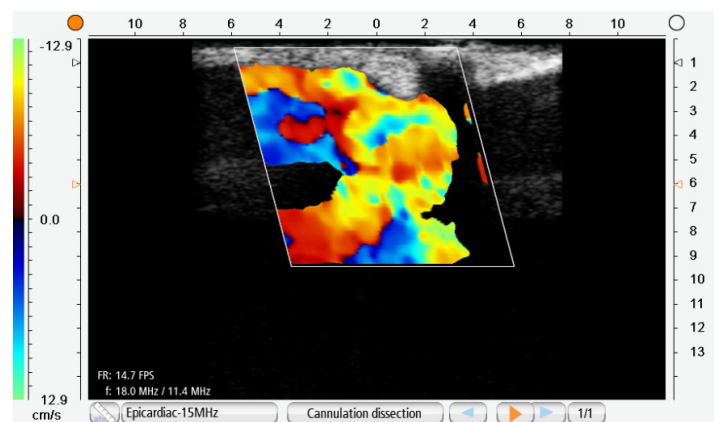


Figure 1. Entry point through the intima at the aortic cannulation site. Photo courtesy of Dr. Edmond Owen

A hematoma of 2 x 3 cm appeared surrounding the cannulation site and extended into the aortic arch on the medial surface. The Medistim L15 imaging probe was utilized and demonstrated an aortic dissection surrounding the cannulation site limited to the greater curvature of the proximal aortic arch (Figure 1.).

Cardiopulmonary bypass was re-instituted via the left Common Femoral Artery and right Atrium. While cooling to 28°C, the clamp was replaced on the distal ascending aorta, the ascending aorta was resected (Figure 2.). The coronary bypass grafts were then prepared for re-implantation. The proximal anastomosis was carried out at the dissection-free sinotubular junction utilizing a 28 mm Hemashield tube graft. The distal anastomosis was carried out as a Hemi-Arch using an open distal technique with circulatory arrest, resecting all dissected tissue. The coronary vein grafts were then sutured to the Hemashield graft while re-warming the blood to 36°C. The patient was weaned from bypass utilizing 5 mcg/kg/min of Dobutamine without difficulty. She was discharged on postoperative day number eight and remains well without problems eight months post-surgery.

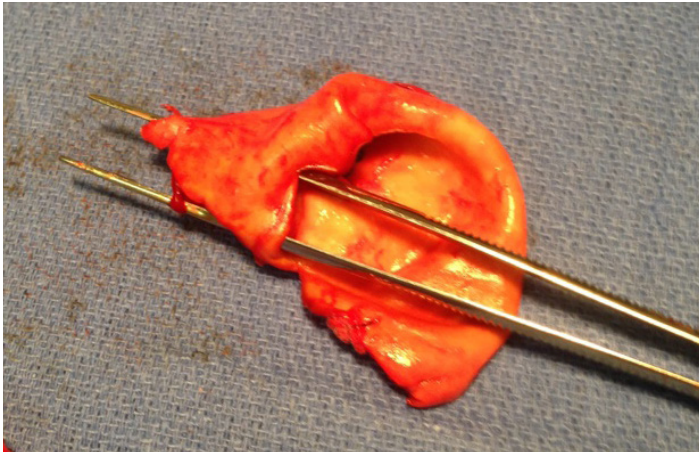


Figure 2. Section of aorta removed, demonstrating resected portion of ascending aorta with initial point of dissection. Photo courtesy of Dr. Edmond Owen

Discussion

Because of the ease of use and accuracy, the Medistim L15 imaging probe is an invaluable tool during procedures where manipulation of the ascending aorta is likely. The imaging probe allows for direct placement on the intended cannulation site without the need of a sterile sleeve or gel. While use of transesophageal ultrasound is prevalent, the Medistim L15 imaging probe gives the surgeon a hands-on tool directly at the intended area of interest. In this case, the probe showed the extent of the dissection and facilitated the decision making process, while indicating the need to repair the hematoma. This case study demonstrates the functionality, simplicity, and advantage of using the Medistim L15 imaging probe. Because of the rapid evaluation and immediate diagnosis, the probe's imaging capability helped identify the problem, and a small portion of the aorta was repaired with no harm to the patient.

Conclusion

Early detection of an aortic dissection after CABG is imperative to saving a patient's life. Epiaortic scanning prior to cannulation or proximal anastomosis site selection can identify the presence of soft or hard plaque as well as dissections as was observed in this case. If used post cannulation, imaging can identify early stage dissection in the aorta and reveal technical errors in grafts prior to chest closure. Use of the Medistim VeriQ C™ flowmeter is easy, quick, and highly reliable. This technology is a beneficial intraoperative guidance tool for evaluating blood flow, vessel disease, and optimal target areas for proximal and distal anastomoses, identifying technical errors and confirming patency throughout the surgical procedure.

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For further information on transit time flow measurement (TTFM) technology and the applications of epiaortic and epicardial scanning, please refer to medistim.com or email medistim@medistim.com.