REFERRAL INDICATION AND PREPROCEDURE DIAGNOSES,1. Dilated cardiomyopathy.,2. Ejection fraction less than 10%.,3. Ventricular tachycardia.,4. Bradycardia with likely high degree of pacing.,PROCEDURES PLANNED AND PERFORMED,1. Implantation of biventricular automatic implantable cardioverter defibrillator.,2. Fluoroscopic guidance for lead implantation for biventricular automatic implantable cardioverter defibrillator.,3. Coronary sinus venogram for left ventricular lead placement.,4. Defibrillation threshold testing x2.,FLUOROSCOPY TIME: ,18.5 minutes.,MEDICATIONS AT THE TIME OF STUDY,1. Vancomycin 1 g (the patient was allergic to penicillin).,2. Versed 10 mg.,3. Fentanyl 100 mcg.,4. Benadryl 50 mg.,CLINICAL HISTORY: , The patient is a pleasant 57-year-old gentleman with a dilated cardiomyopathy, an ejection fraction of 10%, been referred for AICD implantation because of his low ejection fraction and a non-sustained ventricular tachycardia. He has underlying sinus bradycardia. Therefore, will likely be pacing much of the time and would benefit from a biventricular pacing device.,RISKS AND BENEFITS:, Risks, benefits, and alternatives to implantation of biventricular AICD and defibrillation threshold testing were discussed with the patient. Risks including but not limited to bleeding, infection, vascular injury, cardiac perforation, stroke, myocardial infarction, the need for urgent cardiovascular surgery, and death were discussed with the patient. The patient agreed both verbally and via written consent.,DESCRIPTION OF PROCEDURE: , The patient was

transported to the cardiac catheterization laboratory in the fasting state. The region of the left deltopectoral groove was prepped and draped in the usual sterile manner. Lidocaine 1% (20 mL) was administered to the area. After achieving appropriate anesthesia, a percutaneous access of the left axillary vein was performed under fluoroscopy with two separate sticks. Guidewires were advanced down into the left axillary vein. Following this, a 4-inch long transverse incision was made through the skin and subcutaneous tissue exposing the pectoral fascia and muscle beneath. Hemostasis was achieved with electrocautery. Lidocaine 1% (10 mL) was administered to the medial aspect of the incision and a pocket was fashioned in the medial direction. Using the more lateral of the guidewires, a 7-French side-arm sheath was advanced into the left axillary vein. The dilator was removed and another wire was advanced down into the sheath. The sheath was then backed up over the top of the two wires. One wire was pinned to the drape and using the alternate wire, a 9-French side-arm sheath was advanced down into the left axillary vein. The dilator and wire were removed. A defibrillation lead was then advanced down into the atrium. The peel-away sheath was removed. The lead was then passed across the tricuspid valve and positioned in the apical septal location. The active fix screw was deployed. Adequate pacing and sensing functions were established. A 10-volt pacing was used temporarily and there was no diaphragmatic stimulation. The suture sleeve was advanced to the entry point of the tissue and connected securely to the tissue. Using the wire that had

been pinned to the drape, a 7-French side-arm sheath was advanced over this wire into the axillary vein. The wire and dilator were removed. An active pacing lead was then advanced down to the right atrium and the peel-away sheath was removed. The lead was parked until a later time. Using the separate access point, a 9-French side-arm sheath was advanced into the left axillary vein. The dilator and wire were removed. A curved outer sheath catheter as well as an inner catheter were advanced down into the area of the coronary sinus. The coronary sinus was cannulated. Inner catheter was removed and a balloon-tipped catheter was advanced into the coronary sinus. A coronary sinus venogram was then performed. It was noted that the most suitable location for lead placement was the middle cardiac vein. This was cannulated and a passive lead was advanced over a Whisper EDS wire into a distal position. Adequate pacing and sensing functions were established. A 10-volt pacing was used temporarily. There was no diaphragmatic stimulation. The outer sheath was peeled away. The 9 French sheath was then peeled away. Suture sleeve was advanced to the entry point of the tissue and connected securely to the tissue. At this point, the atrial lead was then positioned in the right atrial appendage using a preformed J-curved stylet. The lead body was turned several times and the lead was affixed to the tissue. Adequate pacing and sensing function were established. A suture sleeve was advanced to the entry point of the tissue and connected securely to the tissue. The pocket was then washed with antibiotic-impregnated saline. Pulse

generator was obtained and connected securely to the leads. The leads were carefully wrapped behind the pulse generator and the entire system was placed in the pocket. The pocket was then closed with 2-0, 3-0, and 4-0 Vicryl using a running mattress stitch. Sponge and needle counts were correct at the end of the procedure and no acute complications were noted.,The patient was sedated further and shock on T was performed on two separate occasions. The device was allowed to detect the charge and defibrillate, establishing the entire workings of the ICD system.,DEVICE DATA,1. Pulse generator, manufacturer Boston Scientific, model # N119, serial #12345.,2. Right atrial lead, manufacturer Guidant, model #4470, serial #12345.,3. Right ventricular lead, manufacturer Guidant, model #0185, serial #12345.,4. Left ventricular lead, manufacturer Guidant, model #4549, serial #12345.,MEASURED INTRAOPERATIVE DATA,1. Right atrial lead impedance 705 ohms. P-waves measured at 1.7 millivolts. Pacing threshold 0.5 volt at 0.4 milliseconds.,2. Right ventricular lead impedance 685 ohms. R-waves measured 10.5 millivolts. Pacing threshold 0.6 volt at 0.4 milliseconds.,3. Left ventricular lead impedance 1098 ohms. R-waves measured 5.2 millivolts. Pacing threshold 1.4 volts at 0.4 milliseconds.,DEFIBRILLATION THRESHOLD TESTING,1. Shock on T. Charge time 2.9 seconds. Energy delivered 17 joules, successful with lead impedance of 39 ohms.,2. Shock on T. Charge time 2.8 seconds. Energy delivered 17 joules, successful with a type 2 break lead impedance of 38 ohms.,DEVICE SETTINGS,1. A pacing DDD

60 to 120.,2. VT-1 zone 165 beats per minute. VT-2 zone 185 beats per minute. VF zone 205 beats per minute.,CONCLUSIONS,1. Successful implantation of a biventricular automatic implantable cardiovascular defibrillator,2. Defibrillation threshold of less than or equal to 17.5 joules.,2. No acute complications.,PLAN,1. The patient will be taken back to his room for continued observation and dismissed to the discretion of the primary service.,2. Chest x-ray to rule out pneumothorax and verified lead position.,3. Device interrogation in the morning.,4. Completion of the course of antibiotics.