PREOPERATIVE DIAGNOSES: , Progressive exertional angina, three-vessel coronary artery disease, left main disease, preserved left ventricular function.,POSTOPERATIVE DIAGNOSES:, Progressive exertional angina, three-vessel coronary artery disease, left main disease, preserved left ventricular function.,OPERATIVE PROCEDURE: , Coronary artery bypass grafting (CABG) x4.,GRAFTS PERFORMED: , LIMA to LAD, left radial artery from the aorta to the PDA, left saphenous vein graft from the aorta sequential to the diagonal to the obtuse marginal.,INDICATIONS FOR PROCEDURE: , The patient is a 74-year-old gentleman, who presented with six-month history of progressively worsening exertional angina. He had a positive stress test and cardiac cath showed severe triple-vessel coronary artery disease including left main disease with preserved LV function. He was advised surgical revascularization of his coronaries.,FINDINGS DURING THE PROCEDURE: ,The aorta was free of any significant plaque in the ascending portion at the sites of cannulation and cross clamp. Left internal mammary artery and saphenous vein grafts were good quality conduits. Radial artery graft was a smaller sized conduit, otherwise good quality. All distal targets showed heavy plaque involvement with calcification present. The smallest target was the PDA, which was about 1.5 mm in size. All the other targets were about 2 mm in size or greater. The patient came off cardiopulmonary bypass without any problems. He was transferred on Neo-Synephrine, nitroglycerin, Precedex drips. Cross clamp time was 102

minutes, bypass time was 120 minutes.,DETAILS OF THE PROCEDURE: ,The patient was brought into the operating room and laid supine on the table. After he had been interfaced with the appropriate monitors, general endotracheal anesthesia was induced and invasive monitoring lines including right IJ triple-lumen catheter and Cordis catheter, right radial A-line, Foley catheter, TEE probes were placed and interfaced appropriately. The patient was then prepped and draped from chin to bilateral ankles including the left forearm in the usual sterile fashion. Preoperative checkup of the left forearm has revealed good collateral filling from the ulnar with the radial occluded thus indicating good common arch and thus left radial artery was suitable for harvest.,After prepping and draping the patient from the chin to bilateral ankles including left forearm in the usual sterile fashion, proper time-out was conducted and site identification was performed, and subsequently incision was made overlying the sternum and median sternotomy was performed. Left internal mammary artery was taken down. Simultaneously, left forearm radial artery was harvested using endoscopic harvesting techniques. Simultaneously, endoscopic left leg saphenous vein was harvested using endoscopic minimally invasive techniques. Subsequent to harvest, the incisions were closed in layers during the course of the procedure.,Heparin was given. Pericardium was opened and suspended. During the takedown of the left internal mammary artery, it was noted that the left pleural space was globally softened and left lung was adherent to the chest wall and

mediastinum globally. Only a limited dissection was performed to free up the lung from the mediastinal structures to accommodate the left internal mammary artery.,Pericardium was opened and suspended. Pursestring sutures were placed. Aortic and venous as well as antegrade and retrograde cardioplegia cannulation was performed and the patient was placed on cardiopulmonary bypass. With satisfactory flow, the aorta was cross clamped and the heart was arrested using a combination of antegrade and retrograde cold blood cardioplegia. An initial dose of about 1500 mL was given and this was followed by intermittent doses given both antegrade and retrograde throughout the procedure to maintain a good arrest and to protect the heart.,PDA was exposed first. The right coronary artery was calcified along its course all the way to its terminal bifurcation. Even in the PDA, calcification was noted in a spotty fashion. Arteriotomy on the PDA was performed in a soft area and 1.5 probe was noted to be accommodated in both directions. End radial to side PDA anastomosis was constructed using running 7-0 Prolene. Next, the posterolateral obtuse marginal was exposed. Arteriotomy was performed. An end saphenous vein to side obtuse marginal anastomosis was constructed using running 7-0 Prolene. This graft was then apposed to the diagonal and corresponding arteriotomy and venotomies were performed and a diamond shaped side-to-side anastomosis was constructed using running 7-0 Prolene. Next, a slit was made in the left side of the pericardium and LIMA was accommodated in the slit on its way to the LAD. LAD was

exposed. Arteriotomy was performed. An end LIMA to side LAD anastomosis was constructed using running 7-0 Prolene. LIMA was tacked down to the epicardium securely utilizing its fascial pedicle.,Two stab incisions were made in the ascending aorta and enlarged using 4-mm punch. Two proximal anastomosis were constructed between the proximal end of the saphenous vein graft and the side of the aorta, and the proximal end of the radial artery graft and the side of the aorta separately using running 6-0 Prolene. The patient was given terminal dose of warm retrograde followed by antegrade cardioplegia during which de-airing maneuvers were performed. Following this, the aortic cross clamp was removed and the heart was noted to resume spontaneous coordinated contractile activity. Temporary V-pacing wires were placed. Blake drains were placed in the left chest, the right chest, as well as in the mediastinum. Left chest Blake drain was placed just in the medial section where dissection had been performed. After an adequate period of rewarming during which time, temporary V-pacing wires were also placed, the patient was successfully weaned off cardiopulmonary bypass without any problems. With satisfactory hemodynamics, good LV function on TEE and baseline EKG, heparin was reversed using protamine. Decannulation was performed after volume resuscitation. Hemostasis was assured. Mediastinal and pericardial fat and pericardium were loosely reapproximated in the midline and chest was closed in layers using interrupted stainless steel wires to reappose the two sternal halves, heavy Vicryl for

musculofascial closure, and Monocryl for subcuticular skin closure. Dressings were applied. The patient was transferred to the ICU in stable condition. He tolerated the procedure well. All counts were correct at the termination of the procedure. Cross clamp time was 102 minutes. Bypass time was 120 minutes. The patient was transferred on Neo-Synephrine, nitroglycerin, and Precedex drips.