A Case Report of Combined Radical Pericardiectomy and Beating Heart Coronary Artery Bypass Grafting in a Patient with Tubercular Chronic Constrictive Pericarditis with Coronary Artery Disease

Abstract
We here report a successful midterm outcome following combined off-pump radical pericardiectomy and coronary artery bypass surgery (CABG) in a 65-year-old male patient who was suffering from chronic constrictive calcified tubercular pericarditis with coronary artery disease. Simultaneous off-pump CABG and radical pericardiectomy for nonsurgical constrictive pericarditis is reported very rarely in English literature.

Keywords: Case report, constrictive pericarditis, coronary artery bypass grafting, off-pump, pericardiectomy

Introduction
Chronic calcified constrictive pericarditis is not rare, but its association with coronary artery disease is less reported. Surgical management of constrictive pericarditis as well as coronary artery disease without utilizing cardiopulmonary bypass (CPB) has become standard procedure individually. However, off-pump single-stage surgery combining both procedures has been reported very less. We describe here good outcome following off-pump combined procedure in a 65–year-old male patient for severe calcified constrictive pericarditis and coronary artery disease.

Case Report
A 65-year-old male nondiabetic, nonhypertensive, presented with complaints of dyspnea on exertion Class III and cough of 1-year duration with a history of antitubercular treatment for 9 months in a peripheral hospital. Clinical assessment revealed distended neck veins, pedal edema, ascites, and hepatomegaly. He had no chest pain/palpitation. Electrocardiogram showed low-voltage electric complexes in all leads without any ST segment abnormalities. Chest X-ray showed extensive circumferential pericardial calcification [Figure 1] and bilateral pleural effusion. Transthoracic echocardiography confirmed the diagnosis of constrictive pericarditis by characteristic hemodynamic changes and thickened pericardium of >15 mm. Left ventricular function was normal (left ventricular ejection fraction [LVEF]: 55%) without any regional wall motion abnormalities. Cardiac catheterization revealed diastolic pressure equalization of the right and left heart chambers, and coronary angiography showed severe proximal left anterior descending artery (LAD) disease.

The patient was taken for total radical pericardiectomy and coronary artery bypass surgery (CABG) through median sternotomy under general anesthesia. Preoperative central venous pressure was 18 mmHg. Left internal thoracic artery (LITA) was harvested. Both pleura opened. Radical pericardiectomy was performed over great arteries, ventricles, atria, and vena cava in beating heart. Heart was made free posteriorly to such an extent that coronary sinus (CS) was easily visible and heart could be lifted out from its silhouette [Figure 2a and b]. Hemodynamic stability improved after radical resection of calcified pericardium with near normalization of central venous pressure. After partial heparinization (15,000 IU to maintain Activated clotting time (ACT) >300 s), heart was lifted gently and a large
A gauge piece was placed posterior to left ventricle (LV). LITA to mid LAD anastomosis was performed using Medtronic Octopus stabilizer and intracoronary shunt without utilizing CPB [Figure 3a]. Postoperative recovery was uneventful. After 5-year follow-up, the patient remains in the New York Heart Association Class I functional status with normal ventricular function. Computed tomography (CT) angiogram performed after 2 years of surgery showed patent graft [Figure 3b] and good ventricular function.

Discussion

Tuberculous pericarditis affects 1%–2% of all patients of tuberculosis of chest, but its association with coronary artery disease is less reported due to younger age of involvement.[1] Simultaneous presentation of constrictive pericarditis of other etiology and coronary artery disease has been reported earlier.[2-3] Radical excision of pericardium without CPB is a safe, standard procedure, and the only curative treatment for tubercular constrictive pericarditis. CABG without CPB has become popular with recent advances in operative techniques, instrumentation, and anesthesia, especially in high-risk patient population.[3] CPB may pose extra risk in such high-risk patient. However, simultaneous coronary revascularization and pericardiectomy in a single-stage procedure without utilizing CPB has been reported very less.[4,5] Lifting of the heart is of paramount importance for performing beating heart bypass surgery, thus freeing of posterior LV wall to be done meticulously till the CS is easily visible. Coronary disease as an independent risk factor for early and late outcome after pericardiectomy is not reported in literature. Advanced age at presentation, reduced LVEF, right ventricular dilatation, atrial fibrillation, concomitant tricuspid regurgitation, high inotropic support, and low cardiac output are the bad predictors for early survival after pericardiectomy.[6]

Conclusion

We report a successful single-stage off-pump combined procedure of total radical pericardiectomy and CABG in an adult male patient with good midterm postoperative outcome. Follow-up serial echocardiography showed normal ventricular function and CT angiogram showed patent graft. CABG as an independent risk factor for outcome in cyclic citrullinated peptide remains to be studied. Avoidance of CPB in such compromised heart may offer beneficial outcome.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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