

# CONCOMITANT THYMECTOMY AND OFF-PUMP CORONARY ARTERY BYPASS SURGERY (OPCAB) IN A PATIENT WITH PURE RED-CELL APLASIA

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*Although, thymomas and pure red-cell aplasia are very rare neoplasms and information on thymomas complicated by pure red-cell aplasia is limited on the literature, it is exceptionally rare for the patients with coronary artery disease and pure red-cell aplasia to undergo concomitant thymectomy and off-pump coronary artery bypass (OPCAB) surgery. We present a 55-year-old patient with pure red-cell aplasia, secondary to a thymoma who underwent simultaneous thymectomy and OPCAB surgery with an uneventful surgical outcome.*

*Key Words: Thymoma, off-pump coronary artery bypass*

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**T**hymomas are relatively rare epithelial neoplasms that are known to be associated with autoimmune diseases such as myasthenia gravis (MG), hypo-gammaglobulinemia or pure red-cell aplasia (PRCA). Information on thymomas complicated by pure red-cell aplasia is limited. Fifty percent of all patients with pure red-cell aplasia will have a thymoma. Medical treatment is indicated, unless a thymoma is present. We describe a rare case of a patient with pure red-cell aplasia secondary to a thymoma who underwent concomitant thymectomy and off-pump coronary artery bypass grafting with an uneventful surgical outcome.

## CASE REPORT

A 55-year-old man was admitted to the hospital with atypical angina pectoris, fatigue, palpitation and slight jaundice. In his past medical history, he had occasionally suffered from chest pain for two years and was suffering from weakness, palpitation and jaundice for three

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months. The patient lived in a rural area and this was the first time that he underwent a complete medical examination. He appeared critically ill and lost six kilograms in weight during the previous three months. His physical examination revealed nothing abnormal but a heart rate of 98 beats/minute and diminished respiratory sounds on the left side of the chest. He had severe anemia with a hematocrit value of 21.3% and hemoglobin value of 7.1 gr/dl. A bone marrow material aspiration examination revealed severe erythroid hypoplasia with no evidence of malignancy which led to the diagnosis of pure red-cell aplasia.

The chest roentgenogram followed by a computed tomography of the chest revealed the presence of a mass, located in the left part of the anterior mediastinum, which was proven to be a thymoma after a computed tomography guided needle biopsy. During these tests, the patient experienced two episodes of angina pectoris with ECG changes. An echocardiogram revealed wall motion abnormalities on the anterior wall with a left ventricular ejection fraction of 45%. Coronary angiogram was performed and surgical lesions with critical stenosis were found in three coronary arteries. Because of the possible thymoma induced anemia, thymectomy and concomitant off-pump coronary artery bypass surgery operation was scheduled.

He underwent a routine median sternotomy. A well-encapsulated mass located in the left part of the anterior mediastinum was encountered. The tumor, which originated from the left lobe of the thymus, was removed with the surrounding mediastinal fat tissue. The resected surgical material, weighted 450 grams with the dimension of 11x6x7 centimeters. Histological examination revealed it to be an encapsulated lymphocyte rich type thymoma at Stage 1 according to Masaoka and colleagues classification. (1) After the first part of the operation, harvesting of the left internal mammary artery, as there was no thymic involvement, was performed while saphenous vein conduit was harvested from the right leg, simultaneously. Heparin, 2 mg/kg was administered and, three bypass grafts were performed with the aid of Octopus III (Medtronic Inc., Minneapolis, Min.)

off-pump coronary artery bypass graft (CABG) stabilizer. Transit time flowmeter measurement (TTFM) was performed, as routinely in all off-pump cases, showed good mean flows and pulsatile indexes indicating non-obstructive flows for all three grafts. The patient had an uneventful recovery after the surgery. Although, he received no specific treatment for anemia except for the two units of blood transfusion in the early postoperative period, his hematological test results improved rapidly and, he was discharged from the hospital on day 10 with a hemoglobin concentration of 9 gr/dl, and a hematocrit value of 27%. Six months after the surgery, he remained in good condition with a hematocrit value of 28% without receiving blood transfusion or immunosuppressive therapy.

## DISCUSSION

Pure red-cell aplasia is a rare parathymic syndrome, which is an unusual cause of anemia, reticulocytopenia, and severe erythroid hypoplasia of the bone marrow. (2) Although, pure red-cell aplasia occurs in only 5% of patients with a thymoma, 33-50% of adults with pure red-cell aplasia will have thymoma. Clinically, pure red-cell aplasia portends a poor prognosis with only 25-30% of the patients with this pathology undergoing a thymectomy. For the majority of patients who present with a localized tumor, surgical extirpation remains the standard treatment. (3) Concomitant lesions of the heart and thymus are not very common. Management of the patient, presenting with a concomitant disease basically depends on the strategy of the surgeon. The presence of severe coronary artery disease may increase the morbidity of thymectomy. In addition, a two-stage procedure has the drawback of longer overall hospital stay and the risk of resternotomy. The use of cardiopulmonary bypass (CPB) for the resection of invasive thymomas and the performance of concomitant coronary artery bypass grafting and thymectomy have been described before (4,5) When confronted with a patient with critical coronary artery lesions and symptomatic thymoma, we decided to perform a one stage operation under a median sternotomy incision believing it offered the

best exposure for complete excision of the tumor as well as performing the bypass grafts. CABG performed without the use of cardiopulmonary bypass has become increasingly popular in recent years. Some authors have shown that off-pump coronary revascularisation is associated with a marked decrease in the systemic inflammatory response and its attendant morbidity. (6) Provocation of various inflammatory cascades is greatly diminished by obviating the need for extracorporeal circulation and although this may not be of great importance in low or moderate risk patients, certain high risk patients like the ones' with malignancies may be one of the subgroups that can benefit from off pump techniques. The immunological effects of CPB have always been a concern in patients with malignant disease. Although not proven, it has been postulated that attempts to resect neoplasms during CPB may inadvertently lead to the systemic seeding of malignant cells. (7) In addition, there is a potent immunosuppressive effect of CPB, which may be detrimental to the long-term prognosis of patients with malignancies. Indications for off-pump CABG may change between institution, however evidence suggests that the advantage of off-pump techniques are more clearly observed in high risk patients who present with comorbidities like obstructive lung disease, cerebrovascular disease, impaired renal function, aortic atherosclerosis and malignancies. (8) However, more data is needed to support this conclusion. In our case, off-pump CABG provided a reasonable alternative to conventional bypass surgery. It remains to be seen whether the red cell aplasia will stay in remission during the long-term follow up. To our knowledge, this is the first reported case of extirpation of a thymoma in a patient with red cell aplasia and concomitant off-pump CABG.

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