Pericardiectomy for a patient with constrictive pericarditis and multivessel coronary artery disease

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A B S T R A C T

INTRODUCTION: Pericardiectomy for patients with constrictive pericarditis and multivessel coronary artery disease is rare. Therefore, there is limited experience of pericardiectomy in these patients.

PRESENTATION OF CASE: We performed only pericardiectomy under the support of intra-aortic balloon pumping (IABP) for a patient with tuberculous constrictive pericarditis and multivessel coronary artery disease who refused to accept revascularization. The postoperative course was uneventful.

DISCUSSION: There is limited experience of pericardiectomy in patients with constrictive pericarditis and coronary artery disease, especially in those who want to perform only pericardiectomy and refuse to accept revascularization. There has only been one case report of a patient who had constrictive pericarditis and coronary artery disease, and hemodynamic instability postoperatively who did not have revascularization performed. Cardiopulmonary bypass facilitates dissecting grossly thickened pericardium off the heart and coronary artery exposure, but is associated with higher mortality and reoperation rates, renal failure, and atrial fibrillation. In our patient, cutting grossly thickened pericardium to expose the coronary artery under cardiopulmonary bypass was unnecessary because he refused to accept revascularization. Therefore, we performed only pericardiectomy under the support of IABP to avoid hemodynamic instability.

CONCLUSION: Performing only pericardiectomy under the support of IABP for a patient with constrictive pericarditis and multivessel coronary artery disease is safe and effective as long as the left ventricular ejection fraction is normal.

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1. Introduction

There is limited experience of pericardiectomy for patients with constrictive pericarditis and coronary artery disease, especially in those who want only pericardiectomy performed and refuse to accept revascularization. We report such a patient who had only pericardiectomy performed under the support of intra-aortic balloon pumping (IABP). The patient had an uneventful postoperative course. The work has been reported in line with the SCARE criteria [1].

2. Presentation of case

A 61-year-old man presented with a 4-month history of progressive biventricular failure with predominantly right heart symptoms. He had a history of tuberculosis pericarditis and type 2 diabetes mellitus. He was hospitalized with dyspnea, edema of the lower extremities, and pleural effusion. Computed tomography showed noncalcified pericardial thickening (Fig. 1). Coronary angiography detected major multivessel disease (Fig. 2) and an echocardiogram showed that the ejection fraction was 53% and fractional shortening was 27%. An electrocardiogram indicated sinus rhythm, left precordial lead low voltage, and T-wave alternans. Combined detection of cardiac markers (electrochemiluminescence) showed the following: N-terminal pronatriuretic peptide level, 1098 pg/ml; creatine kinase isoenzyme MB level, 2.42 ng/ml; myoglobin level, 21.00 ng/ml; and quantitative serum cardiac troponin T level, 18.26 ng/ml. The patient refused to have revascularization. Therefore, only pericardiectomy was performed.

With the support of IABP, pericardiectomy was performed through median sternotomy under general anesthesia. After the operation, central venous pressure declined from a preoperative value of 18 mmHg to a postoperative value of 5 mmHg. The postoperative course was uneventful. The patient was extubated within 24 h and discharged with oral medications for coronary artery disease 21 days after the operation. A histological examination of resected pericardium confirmed chronic inflammation (Fig. 3). After 6-months’ follow-up, the patient remained in New York Heart Association class I functional status with complete resolution of pleural effusion (Fig. 4). Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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Fig. 1. Computed tomography scan shows thickening of the pericardium (arrows).

Fig. 2. Coronary angiography shows a completely obstructed left anterior descending coronary artery, completely obstructed right coronary artery, and the origin of obtuse marginal branch stenosis.
3. Discussion

Constrictive pericarditis and coronary artery disease are common diseases. However, the presence of both of these diseases in one patient is rare [2–5]. In the literature, three patients with combined pericardectomy and revascularization on-pump or off-pump had an uneventful recovery [2–4], and one patient had only pericardectomy performed with hemodynamic instability postoperatively [5]. Therefore, there is limited experience of pericardectomy in patients with constrictive pericarditis and coronary artery disease, especially in those who want to have pericardectomy only performed and refuse to accept revascularization.

Performing coronary artery bypass in patients with constrictive pericarditis is challenging for exposure of the coronary artery, especially in patients with multivessel coronary artery disease. Therefore, surgery for patients who have both constrictive pericarditis and multivessel coronary artery disease need support of cardiopulmonary bypass to facilitate dissecting grossly thickened pericardium off the heart and coronary artery exposure [2,3].
lesions only present in the anterior descending artery, pericardectomy and revascularization can be performed off-pump [4]. Our patient refused to have revascularization, which placed doctors in a dilemma. While there has been only one previous report of a patient who accepted pericardectomy, but refused revascularization [5], this provides limited experience. In our patient, pericardectomy removed all of the anterior pericardium between the phrenic nerves from the great vessels superiority down to the diaphragmatic surface as usual. Although some authors believe that relief of symptoms after incomplete pericardectomy is suboptimal and may be an inferior procedure [6–8], this issue remains controversial [9,10].

Unlike the case described by Liwei and Wang [5], hemodynamic instability was not present in our patient with the support of IABP. IABP is the most frequently used mechanical cardiac assist device in patients with high-risk coronary artery disease, and this device increases myocardial oxygen supply and decreases myocardial oxygen demand. Therefore, use of an IABP in the perioperative period can reduce complications and decrease the length of stay in the intensive care unit. Additionally, cardiopulmonary bypass is always used in the condition of total pericardectomy and in patients with hemodynamic instability [7]. However, cardiopulmonary bypass is associated with higher mortality, a higher reoperation rate due to bleeding, postoperative renal failure, and atrial fibrillation [11,12]. Cardiopulmonary bypass was not necessary in our patient and IABP was sufficient to ensure coronary artery blood flow and hemodynamic stability.

We consider that constrictive pericarditis is due to impairment of diastolic ventricular filling caused by a thickened pericardium. The influence of ventricular systolic function in this patient may have been minimal because the medical history was not long (4 months). Multivessel coronary artery disease always affects ventricular systolic function, but the EF of this patient was normal. Therefore, we believe that the effect of multivessel disease on ventricular systolic function in this patient was not serious. Consequently, hemodynamic stability is guaranteed using an IABP.

4. Conclusion

Performing only pericardectomy under the support of IABP for a patient with constrictive pericarditis and multivessel coronary artery disease may be safe and effective as long as the left ventricular ejection fraction is normal.

Conflict of interest

The authors declare to have no conflicts of interest.

Funding

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Ethical approval

Ethical approval was not required for this study because it’s normal medical treatment. So, ethical approval has been exempted by our institution.

Consent

An oral and a written informed consent were obtained from the patient for publication of this case report and accompanying images.

Author contribution

Ansheng Mo participated in patient clinical practice, contributed to collection and analysis of data, design, drafting the manuscript. Xiaoping Yang participated in patient clinical practice.

Registration of research studies

No.

Guarantor

Ansheng Mo.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.ijscsr.2018.06.034.

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