

CASE REPORT

Staged off-pump coronary artery bypass grafting and radical nephrectomy in a patient with multivessel coronary artery disease and a renal tumour

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SUMMARY

Coronary artery diseases and neoplastic disorders are the leading causes of morbidity and mortality in the elderly. Recently, controversial approaches have been raised about the treatment of cases with concomitant occurrence of coronary artery diseases and malignancies. The detrimental effects of cardiopulmonary bypass on neoplastic cells are always a challenge for such cases. We present a case of a large renal tumour associated with a recently symptomatic coronary artery disease which was successfully treated with staged off-pump coronary artery bypass grafting followed by radical nephrectomy. In such patients, off-pump revascularisation is favourable in order to decrease the risk of cancer spreading when compared to traditional on-pump cases. In our opinion, staged off-pump coronary arterial revascularisation followed by definitive surgical treatment for the malignancy is a safe and effective treatment modality in patients with coronary artery disease and oncological diseases.

BACKGROUND

Cardiovascular and oncological diseases are the leading causes of death among the elderly population.¹ In the last decade, controversial approaches have raised about the treatment of cases with concomitant occurrence of these two entities. The first discussion was focused on the risks of simultaneous surgical treatments of critical coronary artery disease (CAD) and the neoplastic disorder.² Afterwards, detrimental effects of cardiopulmonary bypass (CPB) on neoplastic cells drew attention, which may lead to uncontrolled local and systemic spread of the malignant cells, even leading to the growth of hidden malignancies.³ Surgical management of coronary artery disease associated with malignancy can be successfully performed with a patient based algorithm. In this case, we present a large renal tumour associated with recently symptomatic coronary artery disease which was successfully treated with staged off-pump coronary artery bypass grafting (OPCAB) for multivessel disease followed by radical nephrectomy.

CASE PRESENTATION

A 59-year-old man was admitted to the hospital with haematuria and right-sided flank pain. His medical history was unremarkable, but he was an ex-smoker (20 packs/year). On physical

examination a right-sided blunt flank mass was palpated. Diagnostic workup revealed a 10×12 cm right-sided renal tumour (figure 1). Preoperative workup included screening for distant metastasis which was found to be negative. The patient was scheduled for a right radical nephrectomy but meanwhile, he experienced a sudden onset chest pain spreading to his left arm. ECG showed a recent inferior myocardial infarction. Coronary angiography was performed which revealed the multivessel coronary artery disease at left anterior descending (LAD) artery, diagonal and right coronary arteries with an acute occlusion of circumflex artery (figure 2). Echocardiography revealed an ejection fraction of 45–50% with mild mitral regurgitation. Primary percutaneous coronary intervention was performed for the acutely occluded circumflex artery and antegrade flow was provided without stenting. Afterwards, elective coronary artery bypass grafting (CABG) was scheduled and surgery for renal tumour was cancelled. Following general anaesthesia, sternotomy was performed. Pericardium and bilateral pleura were widely opened and multiple stay sutures were placed. Left internal thoracic artery and vena saphena magna were harvested. Following systemic heparin administration, an activated clotting time of 300 s was achieved. Two stay sutures (6/0 polypropylene) with pledgets on the upper side of the target coronary arteries were placed to stabilise the proximal and distal parts of the anastomosis region for each bypass (figure 3). Haemodynamic stability was maintained with fluid administration and trendelenburg position. CABG for the target vessels was successfully performed on beating heart without the

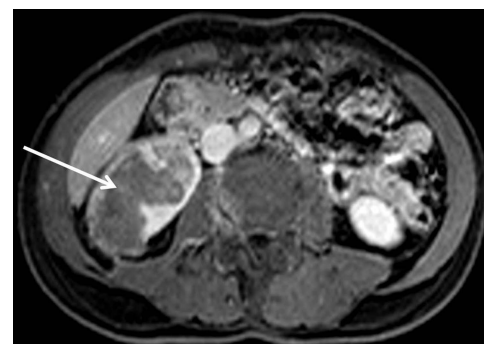


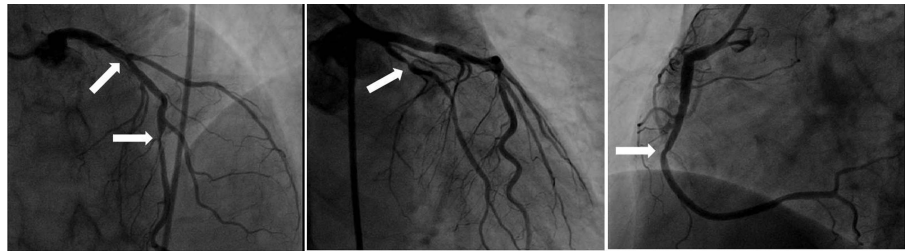
Figure 1 Large renal tumour at the MRI of the right kidney (arrow).



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Figure 2 Multiple stenotic lesions (arrows) at the coronary angiography views of left anterior descending (left) artery, circumflex (middle) and right coronary arteries (right).



usage of a mechanical cardiac stabilisation device (LAD, diagonal, obtus marginalis branches and right coronary artery). Any haemodynamic instability was not encountered as well as any ischaemic changes in ECG. The sternum was approximated with 12 interrupted steel wires in order to maintain effective stability during the positioning for the subsequent nephrectomy. The perioperative period was uneventful; the patient was extubated at the third hour after operation and he was discharged at the fourth day of surgery on aspirin therapy. Two weeks after the operation, oral antiplatelet drug was ceased and subcutaneous low-molecular-weight heparin was started. At the third postoperative week, the patient was operated for the right renal tumour and radical nephrectomy was performed. The tumour arising from middle pole of the kidney was 10×10 cm. The pathological examination of the specimen confirmed papillary renal cell carcinoma at a pathological stage of T3a according to National Comprehensive Cancer Network classification. The antiplatelet treatment was initiated at the second postoperative day. Any coronary adverse event or sternal instability was not encountered in the postoperative period.

OUTCOME AND FOLLOW-UP

The patient was discharged without any complication and he is free of symptoms or recurrence of the tumour at the sixth month follow-up.

DISCUSSION

Treatment strategy for the concomitant CAD and malignancy depends on multiple factors. Patients with acute coronary syndrome, unstable angina pectoris or acute myocardial infarction should undergo myocardial revascularisation before their surgical treatment for neoplastic diseases is scheduled.⁴ On the other hand, stable coronary artery disease can be managed medically, which does not preclude the definitive treatment of the neoplastic disease.⁴

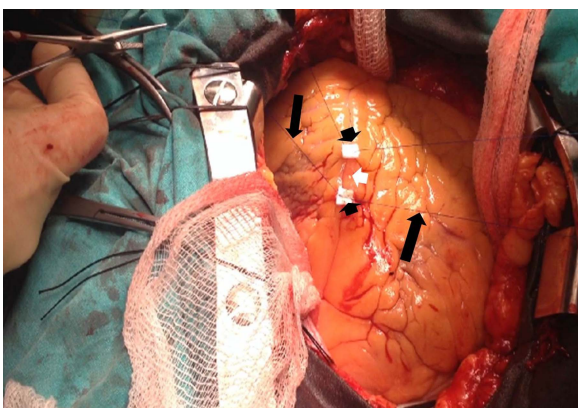


Figure 3 Operative view of the off-pump coronary artery bypass grafting with stay sutures (black arrows) and pledgets (black arrow heads) providing a bloodless and stable zone for the anastomosis of the target vessel (white arrow head).

The nature of the malignant disease also has effect on decision-making. When solid organ malignancies are considered like the renal carcinoma in our case, the preoperative evaluation and imaging workup becomes important. A large mass with local invasion will probably necessitate a more radical resection and postoperative adjuvant chemotherapy and/or radiotherapy, which definitely obligates an unobstructed coronary arterial circulation. In such cases, OPCAB is undoubtedly favourable in order to decrease the risk of cancer spreading when compared to CPB usage.

In patients whom a surgical treatment is planned for the concomitantly present CAD and malignancy, OPCAB must be the choice of coronary revascularisation whenever possible. Trendelenburg position and intravenous fluid administration are the two basic precautions to provide the haemodynamic stability during the OPCAB procedure. We keep the serum potassium levels above 4.5 mEq/L in the preoperative period in order to decrease the risk of arrhythmia.

In our opinion, staged coronary arterial revascularisation with OPCAB followed by definitive surgical treatment for the malignancy is a safe and effective treatment modality in patients with CAD and oncological diseases. The preceding off-pump coronary revascularisation provides a safe treatment opportunity for malignancy including the surgery, chemotherapy and/or radiotherapy.

Patient’s perspective

The patient quickly recovered from off-pump coronary artery bypass surgery followed by a safe and successful complete resection of the tumour without any significant delay in the treatment of the malignancy.

Learning points

- ▶ Cardiovascular diseases are frequent in oncology patients when the age range is taken into account.
- ▶ Management of coronary artery stenosis may require surgical intervention in these patients.
- ▶ Staged approach can safely be performed which provides with safer treatment circumstances in terms of oncological surgery, chemotherapy and/or radiotherapy.
- ▶ Off-pump revascularisation must be the choice whenever possible when the detrimental effects of cardiopulmonary bypass on cancer are considered.

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