Cardiac metastasis due to pulmonary metastasis from a transitional cell carcinoma

Dorota Sobczyk*, Marcin Nosal, Jacek Myc, Grzegorz Trybowski, Izabela Gorkiewicz-Kot, Piotr Olejniczak, and Jerzy Sadowski

Department of Cardiovascular Surgery and Transplantology, Institute of Cardiology, Medical College of Jagiellonian University, Pradnicka 80, 31-202 Krakow, Poland

Received 8 March 2007; accepted after revision 25 March 2007; online publish-ahead-of-print 9 July 2007

We report a rare case of symptomatic cardiac metastasis from a transitional cell carcinoma of the renal pelvis diagnosed by echocardiography. A 75-year-old patient with a long history of neoplasm since 1999 and coronary artery disease with CABG in 2003, was admitted to our department. He underwent cardiac surgery using cardiopulmonary bypass with tumor excision. Histologically it was the same type of transitional cell neoplasm which was operated seven years before.

We present all medical history, detailed 2D and 3D echocardiography, intraoperative pictures and discuss possible chain of changes from renal pelvis cancer to clinical manifestation of cardiac mass. There is proved a rapid progression of cardiac tumor with clinical manifestation few months after control TEE examination without any evidence of cardiac mass. It is important that this is a very rare case of left heart metastasis from right side of circulatory system through pulmonary stage of cancer progression.

**KEYWORDS**
Cardiac metastasis; Transitional cell carcinoma; Pulmonary metastasis; Cardiac surgery; Echocardiography

**Case presentation**
A 75-year-old patient was admitted to our department because of hyperechogenic structure in the left atrium, diagnosed accidentally. Patient presented with symptoms of heart failure and anemia with syncope in the past. Patient had a long history of coronary artery disease. In 1986 non-STEMI of anterior wall with LBBB occurred. In 1998 patient survived cardiac arrest due to ventricular fibrillation. Severe primary arterial hypertension was diagnosed. In July 2003 STEMI occurred and in September 2003 patient underwent coronary artery bypass grafting in our clinic. Also a long history of neoplastic disease was present. In September 1999 a right kidney tumor was diagnosed with a prompt nephrectomy followed by cobalt radiotherapy in October–December. Histopathological examination showed transitional cell papillary carcinoma of renal pelvis, graded as G3, T3N2 (Stage IV). In April 2004 chest X-ray revealed a round shadow in the left lung. Marginal resection of the inferior lobe was performed. In November 2004 CT and chest X-ray showed recurrent tumor in the left lung. In December 2004 patient underwent left inferior lobectomy with partial resection of the chest wall (including two costae). Histopathology after both operations showed a solid non-microcellular, metastatic carcinoma of the lung, poorly differentiated with recent multifocal necrosis, probably metastasis of poorly differentiated transitional cell car-

*Corresponding author. Tel./fax: +48 12 423 39 00
E-mail address: dorotasobczyk@yahoo.com

Published on behalf of the European Society of Cardiology. All rights reserved. © The Author 2007.
For permissions please email: journals.permissions@oxfordjournals.org.

Figure 1 Chest X-ray, showing the round shape in the left pulmonary hilus.
cinoma. In June 2005 control chest X-ray revealed a shadow in the left pulmonary hilus (Figure 1), confirmed also by CT (Figure 2).

On transthoracic echocardiography examination, in our clinic, a massive concentric left ventricular hypertrophy, end-diastolic dimension of left ventricle 52 mm and diminished left ventricular function with LVEF 25–30%, regional wall motion abnormalities and paradoxical motion of interventricular septum were observed. In the left atrium the oval structure of mixed echogenicity was observed, adjacent to anterior mitral leaflet, obturating mitral orifice and protruding into the left ventricle in diastole (Figures S3–S10). 2D TTE did not allow to assess the entire structure and total dimension of the tumor but suggested origin in the enlarged left inferior pulmonary vein. 3D TTE was also performed, that confirmed 2D findings (Figures S11–S13).

Dimensions of the tumor were as follows 4.5 × 2.3 × 3.3 cm – taken from 3D TTE.

Patient was operated using cardiopulmonary bypass, cold crystalloid cardioplegia and in general hypothermy 28°C. A huge tumor, filling the whole left atrium, originating from left atrial appendage without any connection with mitral leaflets, was totally removed (Figures 3–5). Tumor was irregular in shape, with thrombi on its surface and focal necrosis.

Histopathology showed non-microcellular neoplasm, poorly differentiated, probably metastasis of transitional cell carcinoma. Early postoperative course was complicated by low cardiac output syndrome. On the seventh postoperative day patient was transferred in a good general condition to the county hospital. He died a month later because of the progression of neoplastic disease.
Conclusions

Transitional cell carcinoma of the renal pelvis accounts for only 7-10% of all kidney tumors. Infiltrative tumors which are likely to be poorly differentiated often lead to penetration through the urothelial wall and distant metastases. There are only four cases of cardiac metastasis from a transitional cell carcinoma reported in the literature. Malde et al. described ventricular rupture secondary to acute myocardial infarction caused by tumor emboli in the left circumflex artery. Both Kadono et al. and Lin and Telen reported cases of metastatic tumors in the right ventricle. Metastatic infiltration through the inferior vena cava may happen in the clarocellular renal carcinoma. Right-side metastases of transitional cell cancer of renal pelvis of bladder are likely to be a consequence of the same venous flow.

The patient described above had a transitional cell carcinoma of left renal pelvis, high grade (G3) and stage (T3N2) when diagnosed. After an immediate nephrectomy combined with radiotherapy he suffered from recurrent metastases of the left lung. Cardiac tumor in this case seems to be secondary to pulmonary metastasis, that had never been described before. Rapid progression and regionally expanding growth of the cardiac tumor is worth highlighting.

Since September 2003, when he underwent CABG, patient was regularly seen by a cardiologist. Control TTE examinations were also performed every 6 months with no evidence of cardiac masses in the left atrium.

Supplementary material

Supplementary data associated with this article can be found in the online version.

References