

NSS for an RCC in a patient with renal insufficiency after heart transplant because of right ventricular tumor

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The effect of the immunosuppressive therapy on the development of neoplasms has become the object of an ever increasing interest for clinicians all over the world. The literature on neoplasms development in the course of therapy following transplants has confirmed a considerable increase in the incidence of neoplasms of the skin and lymph nodes. Organ neoplasms developing in patients after transplants are characterized by increased progression, poor cellular diversification and a more unfavorable prognosis than in the general population. The aim of the study is to present the case of a nephron-sparing surgery of a renal tumor (NSS) without any intraoperative ischaemia in a 55-year-old female patient with an orthotopic heart transplant and renal insufficiency following a prolonged immune suppression. It is estimated that the patients at the highest risk of neoplasm development are those in the first months after transplant, especially heart transplant. They require maximum doses of immunosuppressive drugs. In the case of patients with initial renal insufficiency the duration of ischaemia of the organ operated on should be minimized, and if possible, surgery should be conducted without clamping the renal pedicle. The surgical treatment of RCC (renal cell carcinoma) in transplant patients does not require any reduction in the amount of the immunosuppressive drugs.

Key Words: NSS ◊ RCC ◊ heart transplant ◊ immunodeficiency

INTRODUCTION

The effect of the immunosuppressive therapy on the development of neoplasms has become the object of ever-increasing interest to clinicians all over the world. The literature on neoplastic development in the course of therapy following transplants has confirmed a considerable increase in the incidence of neoplasms of the skin and lymph nodes. Organ neoplasms developing in patients after transplants are characterized by increased progression, poor cellular diversification, and a more unfavorable prognosis than in the general population [1]. It seems that the patient groups found at the highest risk of the negative effect of immune suppression are those after heart transplants. The maximum doses of drugs in combination with the prolonged survival period after transplant (5-year survival, estimated as 70%) require particular oncological attention. Kidney cancer is among the 10 most common cancers in both men and women. Based on rates from 2007–2009, 1.49% (one in 67) of men and women (Non-Hispanic Caucasians) born today will be

diagnosed with cancer of the kidney and renal pelvis at some point during their lifetime [2]. Only a few cases of occurrence of this type of neoplasm in patients after heart transplant have been described so far. The literature lacks reports on the incidence of renal neoplasms in patients after heart transplant operations performed because of a tumor of that organ.

This study presents the case of a nephron-sparing surgery (NSS) for a renal tumor without any intraoperative ischemia in a 55-year-old female patient with an orthotopic heart transplant and renal insufficiency following prolonged immune suppression.

MATERIAL AND METHODS

In March 2010, a 55-year-old female patient with an orthotopic heart transplant was admitted to the Department of Urology to undergo surgical treatment for a right-kidney tumor. On the day of admission the patient was given tacrolimus in a 2 x 6 mg dose. The physical examination showed no significant deviations from normal and the family history was non-contribu-

tory. The laboratory tests indicated an increased creatinine level up to 185 $\mu\text{mol/L}$, which was related to chronic renal failure following the post-transplant therapy with cyclosporine. The heart transplant was conducted in 1999 due to a tumor of the right ventricle and considerable myocardial insufficiency classified as 3rd/4th NYHA degree. The surgery, which used extracorporeal circulation, was uncomplicated. In the post-operative period, a considerable worsening of the function of the transplanted organ had been observed twice due to acute cell rejection, as confirmed by the biopsy results. The regression of the lesions was accomplished with intensive treatment with cytolytic drugs and glucocorticoid therapy. The patient was discharged with an indefinite recommendation to take Cyclosporine (2 x 50 mg), Azathioprine (1 x 200 mg), and Encorton in the maintenance dose (20 mg/day). The excised cardiac tumor was described as a hamartoma originating from the septum and wall of the right ventricle. Within 11 years after the transplant, the patient had developed arterial hypertension, hypercholesterolemia, and chronic renal insufficiency. In February 2010, a two-day episode of hematuria occurred. The ultrasound examination of the abdomen revealed the presence of a 5-cm hyperplastic lesion in the right kidney. The ultrasound findings were confirmed by a CT-scan (Fig. 1), which demonstrated a fairly well-circumscribed mass that was subjected to a non-homogenous post-contrast enhancement and modeling of the renal calyceal-pelvic system without any trace of stasis. The patient was qualified to an organ-sparing procedure. The surgery was conducted under general anesthesia. The right kidney was dissected free with a 5-cm in diameter mass visible in its central part. During the operation, a decision was made to resign from clamping the renal vessels in order to reduce the risks of ischemia and aggravation of the insufficiency of the organ operated on. A grayish solid mass encapsulated by a pseudocyst was enucleated (Fig. 2). The cavity remaining after tumor removal was filled with a collagen sponge, which was coated with human coagulation factors (fibrinogen and prothrombin), and hemostatic sutures were applied to the renal parenchyma to obtain complete hemostasis. During the procedure, the patient lost approximately 500 mL of blood. The decrease in the blood morphology parameters was equalized with the transfusion of two units of blood during the surgery and another two units in the subsequent days of convalescence.

RESULTS

Immediately after the surgery the patient did not require intensive care. The antibiotic and antithrombotic prophylaxis that was routinely used in the ward was started. On the first post-operative day, a sudden deterioration of the parameters describing



Figure 1. CT-scan: Fairly well-circumscribed mass that was subjected to a non-homogenous post-contrast enhancement and modeling of the renal calyceal-pelvic system.

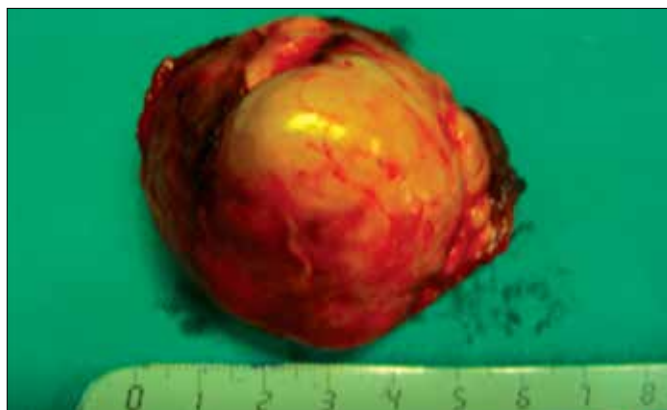


Figure 2. Enucleated tumor.

renal sufficiency was observed, namely oliguria and an elevation of serum parameters of creatinine up to 386 $\mu\text{mol/L}$ and potassium up to 6.7 mmol/L . On the second post-operative day, metabolic acidosis developed ($\text{HCO}_3^- = 22.0 \text{ mmol/L}$, $\text{pH} = 7.25$), creatinine increased to 450 $\mu\text{mol/L}$, potassium oscillated within 5.9 mmol/L , and the blood morphologic parameters deteriorated. The consulting nephrologist ordered intravenous furosemide, glucose with insulin, maintenance of the previously prescribed furosemide dose (80 mg/day), and the hydration with 2,000 mL. The control ultrasound examination showed a small perirenal hematoma. On the third post-operative day, the acute renal failure entered the phase of polyuria, the electrolyte parameters improved, and a considerable decrease in creatinine level was observed.

On the fifth post-operative day the patient's condition stabilized completely. On the fourteenth post-operative day the patient was discharged home in a very good general condition. The creatinine level on the day of discharge was 240 $\mu\text{mol/L}$, potassium was 4.6 mmol/L ,

and the perirenal hematoma was partially reabsorbed. The histopathologic examination of the excised tumor revealed papillary cell carcinoma, which did not exceed the capsule and was coated by a few millimeters of healthy tissue layer. The patient was advised to follow-up periodically in accordance with EORTC directives.

DISCUSSION

The risk of a neoplastic disease occurring *de novo* in recipients during immune suppression is estimated to be within 4% to 18% and is 100–times higher than in the general population. The risk of neoplasm development following a 10–year immune suppression has been estimated at 20% [3]. The most frequently described neoplasms in patients during immune suppression are derived from the lymphatic system and the skin, which is related to the viral etiology of these diseases (Kaposi's sarcoma – human herpes virus-8; non-Hodgkin's lymphoma – Epstein-Barr virus) [4]. It is estimated that the patients at the highest risk of neoplasm development are those in the first months after transplant, especially heart transplant. They require maximum doses of immunosuppressive drugs. Within the last 20 years, the survival period for patients after an orthotopic heart transplant has been prolonged. The five–year survival indices according to the American Heart Association are 72.3% for men and 67.4% for women, respectively. Chronic renal failure is observed in approximately 10% of patients 5–years after heart transplant and increases to 54% after 10–years of immunosuppressive drug intake. However, the ultimate renal failure requiring dialysis or kidney transplant is relatively rare [5].

Papillary renal cell carcinoma constitutes approximately 10–15% of neoplasms of renal origin. The incidence of renal papillary tumors is notably higher in hemodialysis and transplant patients than in the general population in which clear cell RCC accounts for

75–85% of tumors. The difference in histological distribution between RCC in renal transplant recipients and the general population is probably related to the presence of acquired cystic disease of the kidney (ACKD) in dialysis and transplant populations [6]. The effect of immunomodulatory therapy on an increase in the risk of neoplasm formation in an organ has not yet been confirmed unequivocally [7]. According to the literature, the surgical treatment of renal cell carcinoma (RCC) in transplant patients does not require any reduction of the immunosuppressive drugs prior to surgery. Optimal drug doses do not favor the progression of the neoplasm either [8]. Surgical organ–saving procedures are recommended with the shortest possible period of ischemia, remembering that the safe ones are the 20–minute warm ischemia and the 2–hour cold ischemia [9]. It seems obvious that in the case of the patients with the initially disabled kidney function, any ischemia of the organ operated on should be avoided. Based on the reports quoted above, surgical patients with renal carcinoma, while taking immunosuppressive drugs, require the very close multi–center specialist cooperation in the fields of intensive care, nephrology, and transplantology. In spite of the lower immunity to disease and numerous complications due to the post–transplant therapy, the patients with transplanted organs tolerate surgery quite well and the period of their recovery is not significantly longer in comparison with the general population. In view of a potentially greater risk of recurrence and appearance of disease, however, these patients should be monitored closely and regularly [10].

CONCLUSIONS

In light of the increasingly more frequent cases of post–surgical acute renal failure in such cases, surgery should be performed in referral units with access to the intensive care units as well as both the nephrology and dialysis wards.

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