Heart transplantation or combined heart/kidney transplantation? 
Even one renal biopsy may fool you

Martin Haas¹, Renate Kain², Gert Mayer¹ and Rainer Oberbauer¹

Department of Internal Medicine, Division of Nephrology, and ²Department of Ultrastructural Pathology and Cell Biology, University of Vienna, Vienna, Austria

Key words: biopsy; combined heart and kidney transplantation; interstitial fibrosis

Introduction

It is usually assumed that one renal biopsy, i.e. a random sample of 10–20 out of the approximately 2 million glomeruli, provides reliable information on which clinical decisions can be based. That this may not always be the case is illustrated by the following.

Case report

A 59-year-old male patient with a history of long standing diabetes mellitus type II and coronary heart disease was put on the cardiac transplant waiting list because of progressive heart failure. At that time his

Fig. 1. A kidney biopsy specimen (AFOG, × 60). Glomeruli show slight increase in mesangial matrix, tubuli are focally atrophic and arterioles show segmental hyalinosis.

Correspondence and offprint requests to: Dr R. Oberbauer, Univ. Klinik für Innere Medizin III, Klinische Abteilung für Nephrologie und Dialyse, Währinger Gürtel 18–20, A-1090 Vienna, Austria.

© 1999 European Renal Association–European Dialysis and Transplant Association
serum creatinine was normal and he had proteinuria of 0.7 g/day. Subsequently, his kidney function deteriorated and he had to be placed on dialysis 6 months later. A kidney biopsy was performed to determine, if the patient should be listed for simultaneous kidney and heart transplantation. As can be seen from Figure 1, moderate arteriolosclerosis and mild mesangial expansion was found compatible with early diabetic nephropathy. Only 50% of all glomeruli showed these mild sclerotic lesions. Of note, interstitial fibrosis was mild and focal and it was concluded, that after successful heart transplantation the kidney function should recover and therefore a simultaneous renal transplantation was considered inappropriate. The patient was then maintained on dialysis for another 4 months as no compatible donor heart was available. At this time a second staging renal biopsy was performed which, in contrast to the initial biopsy, revealed more marked interstitial fibrosis and progressive glomerular sclerosis in 75% of all glomeruli (Figure 2). The patient was put on the waiting list for combined kidney and heart transplantation.

Teaching point

Renal biopsy is the gold standard to assess renal damage including patients with congestive heart failure. When grave clinical decisions have to be made it is wise to consider sampling error or galloping deterioration of renal lesions and to perform repeat biopsies.

References


Comments

In chronic heart failure, various regulatory mechanisms are activated in order to maintain perfusion of the vital organs. In the kidney, renal plasma flow decreases earlier than glomerular filtration rate due to efferent vasoconstriction mediated by elevated angiotensin II levels, but other vasoconstrictors, e.g. AVP, catecholamines and endothelins are also elevated. Most of these hormones have been shown to accelerate renal interstitial fibrosis and glomerular scarring [1,2]. Intense renal vasoconstriction during the 4 months waiting period may explain the marked aggravation of renal scarring noted between the first and second biopsy. We cannot exclude, however, that the sampling error in the first biopsy led to underestimation of the degree of irreversible renal damage.

Fig. 2. Kidney biopsy specimen from the same patient three months later (AFOG × 60). Glomeruli show overall increase of mesangial matrix. The interstitium is diffuse fibrotic as seen by an increase of space between the tubuli with thickened basement membranes. Almost all arterioles exhibit marked hyalinosis.