Thrombolysis of Blocked Hemodialysis Catheter Using Recombinant Tissue-Type Plasminogen Activator

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Dear Sir,

A complication of any long-term central venous access catheter is blockage secondary to thrombus formation around portals in the catheter tip. This complication has been treated by either removal of the catheter or various protocols involving heparin with streptokinase (SK) or urokinase (UK). We present a case of the successful use of recombinant tissue-type plasminogen activator (rt-PA) in treating a thrombus associated with a dual-lumen Silastic hemodialysis catheter.

The patient was a 54-year-old woman with chronic renal failure secondary to polycystic kidney disease. A renal transplantation had been unsuccessful, and abdominal sepsis had complicated this. Peritoneal dialysis was not feasible because of previous major abdominal surgery, while several unsuccessful attempts had been made to form arteriovenous fistulae. A subcutaneously tunnelled, cuffed, dual-lumen central venous catheter (Quinton HemoCath) was inserted into the right atrium via the supraclavicular route.

On 9 separate occasions over the first 18 months it was necessary to use thrombolytic therapy to obtain satisfactory flows for dialysis. The usual protocol consisted of infusing a solution containing 125,000 IU of SK and 5,000 IU of heparin made up to a volume of 500 ml with 0.9% saline over 20 h (i.e. 6,250 IU/h of SK and 250 IU/h of heparin) into each lumen of the catheter. She had developed a fever on several occasions over the infusion periods, despite prophylactic hydrocortisone therapy.

On this occasion (45 months after catheter insertion) the protocol had been unsuccessful despite doubling the dose of SK. It was assumed that SK had become ineffective because of SK-related antibody formation. Two-dimensional echocardiography demonstrated a thrombus adherent to both the catheter tip and the wall of the right atrium (fig. 1a).

Fig. 1. Echocardiography showing a thrombus (TH) adherent to the catheter tip and the wall of the right atrium (a) and 30 min after successful thrombolysis (b).

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In view of the patient's access history and the improbability of further renal transplantation it was desirable that this catheter remained usable. Cost (NZ \$ 25,000 UK vs. NZ \$ 950rt-PA) and difficulty in obtaining adequate amounts of UK [1, 2] prompted the use of rt-PA. A solution containing 50 mg rt-PA and 50 ml of 0.9% saline was infused through one lumen of the catheter over 4 h (50 mg of rt-PA equivalent to 29,000 IU). Repeat echo-cardiography 30 min later

demonstrated the disappearance of the thrombus and free movement of the catheter tip with each cardiac cycle (fig. 1b).

In our view, rt-PA can provide effective and safe thrombolysis of central venous catheter-associated thrombi and has the advantages over SK of being nonantigenic and activated only in the presence of fibrin. Therefore rt-PA should allow successful repeat treatments.

References

Delaplane D, Scott JP, Riggs TW, Silverman BL, Hunt CE: Urokinase therapy for a catheter-related right atrial thrombus. *J Paediatr* 1982;100:149–152.