Hemodialysis Using a Tenckhoff Catheter for Venous Access and a Double Pump for Blood Flow

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Dear Sir,

We read with keen interest the paper by Vanholder et al. [1]. During 27 months, ending December 1987, 21 patients with end-stage renal disease (ESRD) and 6 patients with acute renal failure (ARF) were hemodialyzed in our center with an adult-sized, single cuff, silastic Tenckhoff catheter used conventionally for peritoneal dialysis, as vascular access, placed surgically in the sub-clavian or internal jugular vein. Due to failure of multiple previous arteriovenous accesses or proven vascular steal phenomena, the only remaining option in these ESRD patients was an indwelling central-venous catheter.

During hemodialysis for 3–4 h, 2–3 days weekly, a double-pump system (BSM 22, Hospal) capable of providing high rates of arterial (150–200 ml/min) and venous flow and low rates of recirculation, was routinely used. A Tenckhoff catheter with a titanium adapter was aligned to a Y-connector attached to blood lines. Mean age of ESRD and ARF patients was $63 \pm (\text{SEM}) 4.1$ and 57.3 ± 6.7 years, respectively.

For ESRD patients in steady state, the following parameters were obtained: BUN 75 ± 3.3 mg/dl, creatinine 9.1 ± 0.7 mg/dl, potassium 5.1 ± 0.1 mmol/l, carbon dioxide 18.7 ± 1 mmol/l, phosphate 6.2 ± 0.3 mg/dl, hematocrit $23 \pm 1\%$. The extent of recirculation on hemodialysis in 7 ESRD patients was calculated to be $9.5 \pm 4\%$.

In ESRD patients, 96.1 ± 91.1 hemodialyses, per catheter, range 2–348, median 56, were obtained. In ARF

patients, 15.6 ± 4.2 treatments per catheter were done, range 6–31, median 12.

A total of 24 catheters were used in 21 ESRD patients; complications were: 6 instances of thrombosis, only 2 being intractable (with and without antithrombin III deficiency) needing catheter removal; 2 instances of *Staphylococcus aureus* septicemia (one needed catheter removal); 2 episodes of postoperative oozing of blood; and 1 episode of inadequate blood flow due to venous stenosis. Poor blood flow from intraluminal thrombosis could often be overcome with instillation of urokinase or aseptic manipulation with a Fogarty catheter. In our experience, peritoneal Tenckhoff catheters functioned well as HD access because of the multiple fenestration at their distal end, permitting bidirectional blood flow.

References

1 Vanholder, R.; Hoenich, N.; Ringoir, S.: Morbidity and Mortality of Central Venous Catheter Hemodialysis: A Review of 10 Years Experience. *Nephron* 47: 274–270 (1987).