

Vasculorama

Dialysis-catheter related bacteremia

A positive blood culture drawn from a dialysis catheter does not necessarily mean that the catheter is the source of the infection. Ideally concomitant blood cultures should be drawn from the catheter site as well as from a peripheral vein, but this is not always practical. More often, especially in outpatient settings, the nurse draws a blood culture and empiric treatment is begun after a cursory examination to rule out other obvious causes of fever. A negative catheter blood culture virtually rules out catheter related bacteremia. A positive one, however, may simply represent colonization and requires that alternate sources of infection be considered (Am J Kidney Dis 44: 779).

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Dealing with infected catheters

There are three ways of dealing with an infected dialysis catheter: First, to remove it, which leaves the patient without vascular access and requires placing a temporary non-tunneled catheter. Second, to exchange the infected catheter over a guidewire, which results in quite a high cure rate of the bacteremia. Third, to instill an antibiotic-heparin lock solution, which has a 60-70% cure rate but a 2% *Candida* superinfection rate? In the presence of *Enterococcus* infections, however, this third approach is contraindicated (ibid).

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Sensitivity to epoxy resin

Two hemodialysis patients developed systemic eosinophilia and had an allergic contact dermatitis at the site of an arteriovenous fistula. Results of initial investigations ruled out most other possibilities, and it was eventually determined that the problem

was hypersensitivity to the epoxy resin connecting the stainless steel needle to the silicone tubing. This finding was later confirmed by patch testing, and the patient was managed by changing the type of needle and applying a steroid cream locally (Am J Kidney Dis 45: E23).

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Cryotherapy for venous stenosis

Percutaneous balloon cryotherapy is a potentially useful new technology used to treat rapidly recurring venous stenoses of arteriovenous grafts. Nitric oxide is introduced into the lumen of a special "cryoballoon", becomes transformed into a gas and in the process expands the balloon, thus reducing the temperature temporarily, freezing the neointimal venous hyperplastic cells, and causing necrosis or apoptosis without disrupting the matrix structure. In five patients with rapidly recurring stenosis the time to stenosis or thrombosis was significantly increased with this approach (Am J Kidney Dis 45: E27).

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Embolising centrally stenosed fistulas

The ideal way to treat the grossly edematous arm caused by venous hypertension is to reestablish the venous circulation by angioplasty. When this is not feasible the fistula may have to be ligated – a procedure that can be difficult if there is easily elicitable bleeding or if adequate local anesthesia cannot be easily obtained. An alternative approach is to establish another access and then embolize the fistula. This is achieved by stopping the blood flow with a detachable balloon and then occlude the vein with the use of coils, detachable balloons, covered stents, microcoils, or tissue-adhesive Histoacryl (Nephrol Dial Transplant 20: 199).

Central venous stenosis still a problem

Central venous stenosis remains a not infrequent complication seen in dialysis patients, even though subclavian vein cannulation has been largely abandoned in favor of using the internal jugular. In Canada this issue was studied over a period of 14 months in a series of 133 patients undergoing venography for slow blood flow, high venous pressure, delayed fistula maturation, or edema of the face or arm. Of these only 18 patients had subclavian vein insertions. Greater than 70% central stenosis was found in 55 (41%) patients – roughly half in the superior vena cava or innominate vein and half in the subclavian vein or at its junction with the cephalic. Of this study population 100 patients also had co-existent peripheral stenosis. The patients with central stenosis were found to have been on dialysis for longer periods of time and, as expected, had a history of multiple catheter insertions. Outcome was generally unfavorable, most patients continuing to have access problems and exhibiting a high mortality (ASAIO J 51: 77).

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Middle molecules and vascular damage

A host of uremia retention products could also contribute to vascular damage and arteriosclerosis in dialysis patients. Some of these compounds cause oxidative or carbonyl stress by releasing harmful enzymes or generating advanced glycation products. Elevated homocysteine levels have been suspected to increase the risk of cardiovascular disease, as has impaired endothelium-dependent vasodilatation due to the inhibition of nitric oxide generation by excessive accumulation of ADMA (asymmetrical dimethylarginine) (Kidney Int 66: 1719).

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Venous anastomosis stents may be helpful

Venous anastomosis stents appear to prolong the life of arteriovenous grafts. In a recent study they were used in patients who had previous angioplasty of the same lesion within three months, whose lumens collapsed immediately after angioplasty, or who had significant residual stenosis after angioplasty. With the use of stents graft longevity was

somewhat prolonged. Six month survival was 63% unaided and 81% with additional intervention, at least giving time to allow maturation of a newly placed access and avoiding catheter use. Stents do not, however, prevent new venous hyperplasia developing at sites outside of the intravascular stent itself (Kidney Int 67: 678, 772).

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Different types of stents available

A variety of different types of stents are now available. They may be made of stainless steel (Wallstent, Gianturco), nitinol [nickel and titanium alloy] (e.g. SMART, Symphony, Memotherm) or as coated stents (nitinol/titanium coated with Dacron (e.g. Cragg) or cobalt/titanium coated with PTFE (e.g. Wallgraft). It appears that not all stents have necessarily the same efficiency (Kidney Int 67: 772).

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More stenoses in grafts than in fistulas

The outcome of venography is different for AV grafts and in fistulas. This was shown in a clinical monitoring program in which patients were investigated because of such findings as absent thrill, distal edema, difficulty in cannulation, aspiration of clots, excessive post-dialysis bleeding, or declining measured Kt/V. The likelihood of finding a significant stenosis was substantially lower in fistulas than in grafts. By fistulogram venous stenoses were found in two thirds of grafts but in only 40% of fistulas. Patients with grafts were more likely to have two or more stenoses and they were also more likely to have stenoses at the venous outlet. Only 10% of patients had evidence of central stenosis (Am J Kidney Dis 44: 859).

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