Antibiotic Resistance Develops in a Diabetic Patient Case Study

Vancomycin-resistant *Staphylococcus aureus* (VRSA) was isolated from the exit site of a dialysis catheter in a 40-year-old diabetic with a history of peripheral vascular disease, chronic renal failure, and chronic foot ulcers. A few months earlier, the patient’s gangrenous toe had been amputated. Following that surgery, the patient developed bacteremia with methicillin-resistant *S. aureus* from an infected hemodialysis graft. Vancomycin, rifampin, and graft removal successfully treated the infection.

A few months later, when the catheter exit site infection appeared, the area was cultured and the catheter removed, successfully treating the infection. A week later, the patient’s chronic foot ulcer again appeared infected. Vancomycin-resistant *Enterococcus faecalis* (VRE) and *Klebsiella oxytoca* were cultured from the ulcer. The patient recovered after wound care and systemic treatment with trimethoprim/sulfamethoxazole.

Analysis of the VRSA isolate revealed that it contained the *van* A gene for vancomycin resistance and the *mec* A gene for oxacillin resistance.

* *How do you think the* Staphylococcus aureus *strain ended up with the gene for vancomycin resistance?*
* *What is one possible mechanism for genetic transfer of antibiotic resistance from one organism to another?*
* *Why would this particular patient be at increased risk for infection with VRSA?*