Vascular Access Infection Associated with Methicillin-Resistant *Staphylococcus aureus* Nasal Carriage in a Hemodialysis Patient

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Dear Sir,

Infection with methicillin-resistant *Staphylococcus aureus* (MRSA) is one of the major opportunistic hospital infections. MRSA infections cause significant morbidity and mortality in compromised hosts, particularly in the hospital environment. A high incidence of MRSA nasal carriage (MRSA-NC) has been frequently reported in chronic dialysis patients. There is a high risk of bacteremia in hemodialysis (HD) patients with MRSA-NC as well as a high incidence of exit-site infections or peritonitis in patients treated with continuous ambulatory peritoneal dialysis (CAPD) [1, 2]. Few reports have found severe vascular access infections associated with MRSA-NC in HD patients immediately after the vascular access operation. We herein report a case who suffered from vascular access infection associated with MRSA-NC.

A 79-year-old male undergoing maintenance HD was referred from another hospital because of vascular access complications. The patient had been operated on for a primary standard arteriovenous fistula (AVF) for vascular access in the left forearm, but a few days later the access had failed owing to *S. aureus* infection, and a similar operation for the vascular access had been performed in the right elbow area, but the access had failed again because of severe infectious bleeding due to MRSA, and the right brachial artery had been partially resected and reconstructed because of the access infection to the artery. The patient had taken sufficient energy and proteins before operations, and had been in good health. Causes of access infections were not clearly elucidated. Physical examination at the time of admission to our hospital revealed: access operation scars in bilateral arms, a body temperature of 36.0°C, a heart rate of 78 beats/min, and blood pressure of 132/72 mm Hg. Laboratory studies showed: hemoglobin 9.4 g/dl, hematocrit 28.8%, white cell count 5,400/ μ l, platelets 12.8×10^4 / μ l, blood urea nitrogen 32 mg/dl, serum creatinine 6.5 mg/dl and total protein 6.0 g/dl. Physical examination and laboratory investigation established no inflammation. According to bacteriological examinations, microscopical examinations of sputum, blood, and throat swab were negative for MRSA, and urine cultures were sterile. However, nasal swab culture disclosed

MRSA. It was considered that his previous episodes of AVF infection were related with MRSA-NC. After cefazolin, gentami-cin, and vancomycin were administered intravenously, nasal swab culture was negative for MRSA. Then a radiocephalic AVF for vascular access was placed in the patient with the same antibiotic therapy to be continued until removing the stitches after the access operation. The following operative procedure was performed: the skin was sterilized by popidone iodine. Under local anesthesia, a skin incision (4 cm) was made along the radial artery at the left forearm. The radial artery and cephalic vein were easily exposed. The artery was visually moderate in arteriosclerotic changes, the diameter of the artery was 3.5 mm, and that of the vein was 4 mm. The radiocephalic AVF was created using 7-0 Prolene with a continuous suture

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of side-to-side anastomosis. The orifice of the AVF was 6 mm in diameter. The distal venous side of the anastomosis was ligat-ed. The skin was closed in one layer using 3-0 nylon. The access murmur and thrill was very well. The whole procedure was uneventful.

As a result, we succeeded in making a permanent vascular access in the patient. He was discharged and became an HD outpatient. It was demonstrated that the vascular access infection in our patient was associated with MRSA-NC. At the time the patient had received the first operation for vascular access, he had not yet been subjected to HD. Therefore, MRSA-NC had already occurred before the induction of HD. It is generally considered that the carriage rate of MRSA ranges from 10 to 30%, reaching as high as 60% in HD patients. There is a high risk of MRSA infection in the NC of a patient on CAPD or HD [1-4]. It is reported that dropout, particularly from CAPD, is significantly attributable to MRSA infection [1]. Oral antibiotic therapy is generally known to eradicate MRSA-NC in 60-90% of patients, for example, bacitracin, rifampicin, tetracy-cline, or ofloxacin are recommended [2]. In topical (nasal) antibiotic therapy, it is re-

ported that mupirocin (pseudomonic acid) was very effective, and nasal mupirocin led to the eradication of MRSA-NC in 96.3% of cultures, thus reducing the incidence of MRSA-related infections [1, 3]. However, the management of MRSA-NC is difficult. Even if nasal cultures are negative for MRSA, recolonization will occur 3 or 4 weeks after the antibiotics are stopped. As mupirocin was not approved in Japan, the nasal administration of mupirocin was not an alternative treatment strategy. We administered antibiotics (vancomycin, gen-tamicin, cefazolin) intravenously before the access operation. We verified that the nasal culture of the patient showed no MRSA before we performed the radiocephalic AVF operation. Hence there was no infectious episode on the AVF postoperatively. We have found little in the literature regarding vascular access complications due to MRSA-NC. In a case with frequent vascular access infections, it should be tested whether the case is MRSA-NC or not. In case of MRSA-NC, we should firstly eradicate MRSA-NC by appropriate therapies, and then perform the vascular access operation. In addition, prophylactic antibiotic therapy is further recommended.

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372

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Takeda/Nakamoto/Yasunaga/Nishihara/ Matsuo/Urabe/Goya