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CORRESPONDENCE

Carbapenem-resistant *Acinetobacter baumannii* mediastinitis after aortic graft implantation successfully treated by adjunctive gentian violet irrigation and antibiotic combination therapy

To the Editor,

Carbapenem-resistant *Acinetobacter baumannii* (CRAB) has increasingly emerged as an important nosocomial pathogen,[1–3] and the postoperative mediastinitis complicating mediastinal abscess caused by CRAB is rare. It is a refractory and has severe complication associated with high morbidity and mortality. With great interest, we read the article by Leu et al[1] in the *Journal of Microbiology, Immunology and Infection,* which reported that combined antibiotic therapy of imipenem/colistin reveals the *in vitro* synergistic activity against CRAB infections. However, the clinical experience of adjunctive disinfectant agents combined with antibiotics therapy for CRAB mediastinitis complicating surrounding abscess of the aortic grafts is rare. Here, we report a patient with type A aortic dissection complicated with postoperative mediastinitis and abscess formation due to CRAB infections. Conventionally, the postoperative aortic implant infection complicating with surrounding abscess needs the excision of the prosthetic graft,[4] but the patient was successfully treated by adjunctive gentian violet irrigation, surgical debridement, and tigecycline/colistin/sulbactam combination therapy.

A 47-year-old male patient was diagnosed as type A aortic dissection at admission. He received total aortic arch replacement + frozen elephant trunk implantation + bilateral subclavian arteries bypass surgery after admission. He suffered from a complication of stroke with consciousness disturbance and weakness of right side upper and lower limbs on postoperative Day 1. A computed tomography (CT) scan of the brain revealed a massive ischemic infarct in the left side middle cerebral arterial territory. He received anticoagulant agents and prophylactic antibiotic therapy with vancomycin 1 g intravenously (IV) q. 12 hours for 2 days because he had a methicillin-resistant *Staphylococcus aureus* furuncle 1 year earlier. The sputum culture from the endotracheal tube showed CRAB at the 2nd week, but chest radiography revealed no infiltration patch, so the sputum culture with CRAB was considered as colonization. Unfortunately, he had fever, chills, and turbid drain fluid from the chest tube on the postoperative Day 14. The CT scan of the chest showed much fluid accumulation, the location of which was anterior to the aortic graft (Figure 1A). He received surgical debridement immediately for the mediastinitis and surrounding abscess of the aortic graft. Empiric antibiotic therapy of ceftazidime 2 g IV q. 8 hours and amikacin 500 mg IV daily were administered. The species identified by matrix-assisted laser desorption ionization-time of flight mass spectrometry available 4 days later was *A. baumannii* genospecies 2. The susceptibility test of blood and pus isolates were resistant to carbapenems, ampicillin/sulbactam, cefoperazone/sulbactam, amikacin, ciprofloxacin, and piperacillin/tazobactam, but sensitive to tigecycline and colistin respectively. The minimal inhibition concentration of meropenem was $\geq$8 mg/L, ampicillin/sulbactam $\geq$16 mg/L, tigecycline $\leq$1 mg/L, and colistin $\leq$1 mg/L. The patient had persistent fever, leukocytosis, and residual turbid fluid from the drain tube after the second surgical debridement on postoperative Day 21 (Figure 1B). Parenteral antibiotics was therefore changed to tigecycline 50 mg every 12 hours and colistin 4 MU every 12 hours, with added sulbactam 1 g every 6 hours as combination therapy. We added 500 mL of 0.02%

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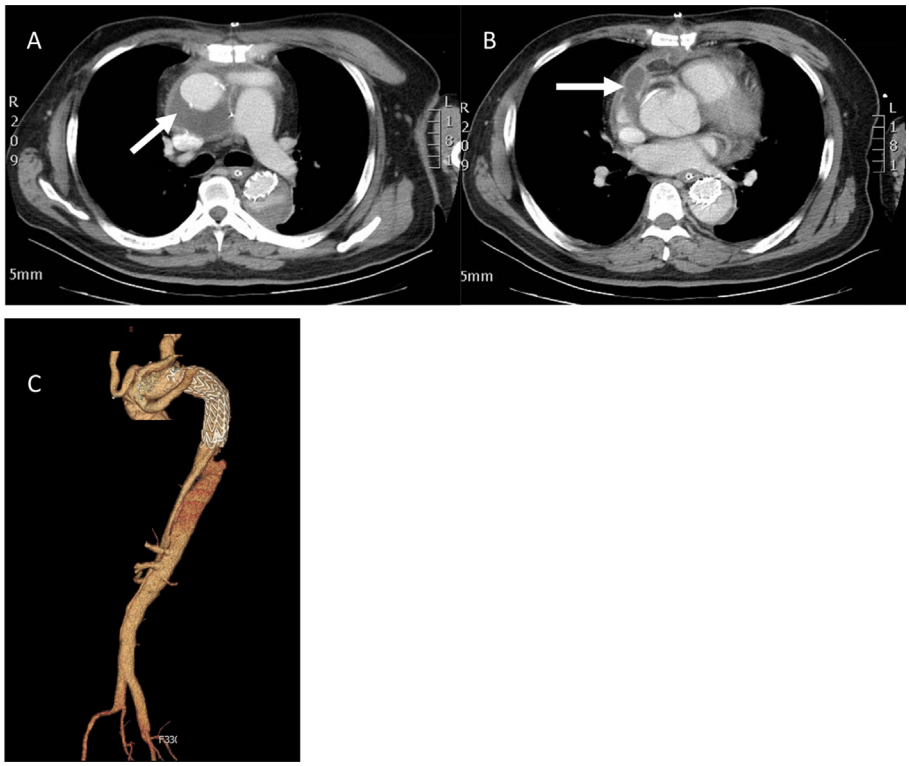

Figure 1. (A) Computed tomography of the chest revealed massive fluid accumulation in the mediastinal cavity (white arrow). (B) There was some residual abscess surrounding the periaortic area after the second surgical debridement (white arrow). (C) Computed tomography and angiography revealed no evidence of reinfection of the aortic graft after adjunctive gentian violet irrigation and antibiotic combination therapy.

gentian violet solution, four times a day, with continuous closed irrigation for 3 days, then intermittent irrigation with 500 mL solution three times a day for 7 days, then intermittent irrigation with 500 mL solution twice a day for 20 days, for a complete course of 30 days. The turbid discharge decreased day by day and the fever subsided. He received combination therapy with the above three antibiotics for 42 days. The patient's third operation revealed no fluid accumulation, and the result of the bacterial culture from the mediastinal area by using irrigated saline showed negative growth. He received the left pectoralis major flap coverage, and split thickness skin graft on the surgical wound of anterior chest wall after the CT scan revealed no evidence of reinfection 1 month later (Figure 1C). The patient was followed up at outpatient clinic for 6 months and there was no complication or side effect of gentian violet irrigation.

Gentian violet solution (triphenylmethane) is known to be a potent antibacterial agent for methicillin-resistant *S. aureus* and *Pseudomonas aeruginosa*.[4–6] The efficacy of rifampicin, povidone—iodine, or gentian violet has been reported in the literature.[4–6] The advantages of gentian violet solution include the less deposition on necrotic tissue and lack of local irritant action. The disadvantage of this agent is its high viscosity even at low concentrations.[4] In our patient during the irrigation period, there was occasional obstruction of the drainage tube. However, the combination of antibiotics (tigecycline/colistin/sulbactam) and the adjunctive irrigation of gentian violet is considered to be an effective treatment for CRAB mediastinitis post aortic graft surgery.

Conflicts of interest

All authors have no conflicts of interest to declare.

References

1. Leu HS, Ye JJ, Lee MH, Su LH, Huang PY, Wu TL, et al. Synergy of imipenem/colistin methanesulfonate combinations against imipenem-nonsusceptible multidrug-resistant *Acinetobacter baumannii*. *J Microbiol Immunol Infect* 2014;**47**:406—11.
2. Ku WW, Kung CH, Lee CH, Tseng CP, Wu PF, Kuo SC, et al. Evolution of carbapenem resistance in *Acinetobacter baumannii*: an 18-year longitudinal study from a medical center in northern Taiwan. *J Microbiol Immunol Infect* 2015;**48**:57—64.
3. Teng SO, Yen MY, Ou TY, Chen FL, Yu FL, Lee WS. Comparison of pneumonia- and non-pneumonia-related *Acinetobacter baumannii* bacteremia: impact on empiric therapy and antibiotic resistance. *J Microbiol Immunol Infect* 2015;**48**:525—30.
4. Ishikawa S, Katayama Y, Mishima H, Ohnishi K. Successful treatment of an infected vascular graft. *Interactive Cardiovasc Thoracic Surg* 2013;**16**:79—80.
5. Igari K, Jibiki M, Terasaki H, Kudo T, Sugano N, Inoue Y. Preservation of infected prosthetic grafts by irrigation with gentian violet solution. *Jpn J Vasc Surg* 2010;**19**:625—9.
6. Igari K, Jibiki M, Kudo T, Sugano N, Inoue Y. Drainage surgery followed by postoperative irrigation with gentian violet for prosthetic graft infection caused by methicillin-resistant

Staphylococcus aureus. *Eur J Vasc Endovasc Surg* 2011;**41**: 278—80.

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