Hospital-acquired Skin and Skin-structure Infection in COVID-19 Infected Patient with Prolonged Hospitalization

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Figure 1. (A) The abscess on day 25 of hospitalization. (B) Spontaneous rupture of the abscess on day 26 of hospitalization after 1 day of oral linezolid therapy. (C,D) The wound post-debridement on day 29. (E) The wound on day 32 of hospitalization.

A 53-year-old woman presented to emergency department with the chief complaint of worsening dyspnea. Further diagnostics revealed a positive PCR result for SARS-CoV-2 and she was admitted with COVID-19 pneumonia and received intravenous (iv) as well as oral medications. The patient did not have known comorbidities such as hypertension or diabetes mellitus. On the 10th day of hospitalization, the patient complained of pain and redness in the right lower forearm where iv catheter was inserted. The iv line was immediately removed but a new iv line was placed adjacent to the previous site. Similar complaint ensued, and the iv line was subsequently also removed. On the 11th day the patient developed signs of superficial thrombophlebitis in the two sites, and the patient continued to receive iv medications through iv line placed in her left arm. The inflammation did not subside, and the patient was assessed as having cellulitis on the 15th day of hospitalization. Intravenous ampicillin-sulbactam was subsequently started, and the wound care was done using saline compress and topical gentamicyn applied twice daily. Cutaneous abscess initially developed on the 17th day of hospitalization, with a punctum of 0.5 cm in diameter. The patient continued to receive the same treatment until a large abscess with a diameter of 5 cm was formed (**Figure 1A**) on the 25th day of hospitalization. The patient was eventually transferred to the care of infectious disease specialist and assessed as having a bacterial skin and skin-structure infection. Previous antibiotics were stopped, IV line was removed, and all treatment was switched to oral medications. The patient was immediately started on oral linezolid after wound tissue was sent for culture. After 1 day of linezolid, the abscess ruptured spontaneously (**Figure 1B**). A surgical consult was made, and debridement was performed on day 27. The patient PCR for SARS-CoV-2 eventually came back as negative, and all signs and symptoms of pneumonia had resolved on day 28. The wound healing showed significant progress on day 29th (**Figure 1C**). The tissue culture came back with *Pseudomonas aeruginosa*, a common pathogen for hospital acquired infection. On day 32 (**Figure 1D**), there were still two wounds on the forearm with the size of 2 x 2 cm and 7 x 2.5 cm. The edema had resolved and there was no sign of cellulitis surrounding the wound. The base of the wounds consisted of subcutaneous tissue and granulation tissue with moderate exudate (phase 2 wound healing). Slough, eschar, and necrotic tissue were not present on the wound. Foam dressing was used and dressing change was done every 3 days or earlier if the dressing saturated. Although the healing of the wound showed significant progress, to avoid further prolonged hospitalization, wound treatment was continued at home and reconstruction using local flaps was planned electively.

Acute bacterial skin and skin-structure infections (ABSSSI) is defined in 2013 by the US Food and Drug Administration as a bacterial cellulitis/erysipelas, major skin abscesses, and wound infections.[1] The Infectious Diseases Society of America (IDSA) in 2014 classifies skin and soft-tissue infection (SSTI) as either non-purulent (which includes cellulitis, erysipelas, and necrotizing infection) or purulent (including furuncle, carbuncle, and abscess).[2] Among hospitalized patients with SSTI, healthcare-associated infections account for 73.5% of all cases.[3] Notably, skin and skin-structure infections caused by *Pseudomonas aeruginosa*, a common hospital pathogen, was reported to cause higher total cost and longer hospital length of stay compared to non-*P. aeruginosa* cases,[4] despite causing only approximately 5.7% of all healthcare-associated SSTIs. Infection with *P. aeruginosa* should always be considered in non-healing skin infections in patients with prolonged hospitalization and antibiotic exposure.[2] Tissue culture, preferably taken by surgical debridement, should be promptly performed; and when hospital-infection is suspected, appropriate antibiotics should be started along with removal of all devitalized tissue and to promote skin and soft tissue healing. Expedited discharge should be considered when possible, with adequate antibiotic treatment and follow up for definitive wound treatment.

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