

A rare case of *Wolfffabrtilimonas chitiniclastica* infection in California



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INTRODUCTION

We report a case of *Wolfffabrtilimonas chitiniclastica* in the setting of neck, upper portion of the back, and right shoulder wounds with maggot infestation. *W chitiniclastica* is a gram-negative, aerobic, and nonmotile rod with strong chitinase activity.¹ Reports of this pathogen in humans are very rare, with only 9 published cases of human infection within the contiguous United States, 1 patient in Utah,² 2 patients in Ohio,^{3,4} 1 patient in Washington,⁵ 2 patients in Kentucky,⁶ 1 patient in Pennsylvania,¹ and 1 patient in North Dakota.⁷ Here, we report an early case of this bacterial infection in California. The patient was a 51-year-old woman diagnosed with *W chitiniclastica* bacteremia secondary to maggot-infested skin ulcers.

CASE REPORT

A woman in her 50s with a history of substance abuse and homelessness presented to the emergency department for evaluation of severe pain from large open ulcers on her neck, upper portion of the back, and right shoulder, which contained dozens of live maggots (Fig 1). The ulcers were previously biopsied 2 years previously and diagnosed as basal cell carcinoma; however, she was lost to follow-up at that time.

The ulcers contained abundant necrotic material as well as maggots, and their borders were erythematous and indurated, leading to concern for cellulitis. Although she was afebrile, she had a leukocytosis (15.0 K/ μ L; reference range, 4.0-11.0 K/ μ L). Wound cultures were obtained prior to starting treatment

with clindamycin, vancomycin, and piperacillin/tazobactam. She was taken to the operating room where the wounds were debrided, irrigated, and biopsied. She was admitted for intravenous antibiotics and wound care, and the infectious disease department was consulted.

Wound cultures obtained at the time of admission returned positive for only 2 bacteria: *W chitiniclastica* and *Providencia stuartii*. *W chitiniclastica* is a gram-negative bacterium found on maggot larvae and has been reported to cause bacteremia after wound infections.^{1,8} *Providencia stuartii* is a gram-negative bacterium found in water, soil, and animal reservoirs, and is a common cause of catheter-associated urinary tract infections.⁹

Antibiotic sensitivity data for the *W chitiniclastica* isolate were reported by the clinical laboratory (Table D), and the patient completed an additional 7-day course of ciprofloxacin 500 mg twice daily and amoxicillin/clavulonate 875 mg twice daily with resolution of the leukocytosis and reduction in erythema around the wound.

Subsequent oncologic evaluation of her advanced basal cell carcinoma indicated involvement of her axillary lymph nodes as well as metastasis to the lung, both confirmed by pathologic diagnosis on fine-needle aspiration, and she was started on the hedgehog signaling pathway inhibitor vismodegib.

DISCUSSION

In patients infected with *W chitiniclastica*, the clinical course has been reported as ranging from

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Fig 1. Wound with maggots present in the upper portion of the back.

Table I. Antibiotic susceptibilities for *Wohlfahrtiimonas chitiniclastica* isolated from the patient

Antibiotics	<i>Wohlfahrtiimonas chitiniclastica</i>
Cefepime	Susceptible
Ciprofloxacin	Susceptible
Gentamicin	Susceptible
Piperacillin/tazobactam	Susceptible
Tobramycin	Susceptible
Trimethoprim/sulfamethoxazole	Susceptible

modest wound infection to severe bacteremia, potentially resulting in septic shock and death.^{1,2,8,10} *W chitiniclastica* can be recovered from standard bacterial tissue culture and has also been isolated from blood culture.^{1,3,4,6-8,10-13}

Most reported infections have been associated with comorbid diseases of the skin, including ulcers, wounds, gangrene, and cellulitis.⁸ This suggests that bacterial transmission occurs through damaged skin and mucosal membranes.^{1,3,8} The patient described here had a chronic wound due to long-standing and ulcerated basal cell carcinoma, which served as a breeding ground for flies to lay their eggs. These subsequently developed into larvae (maggots), which feed on devitalized tissue. Notably, this is only the second case of *W chitiniclastica* associated with malignancy. The first case was reported in a

75-year-old man with squamous cell carcinoma with maggot infestation.¹

Anatomically, sites of wound infection reported with cases of *W chitiniclastica* bacteremia are diverse and include the face,^{7,11} scalp,¹¹ shoulder,¹² umbilicus,¹³ groin,¹⁰ sacrum,¹³ ischium,⁴ and the lower extremities.^{1-3,5,14,15}

Additional risk factors for *W chitiniclastica* infection include increasing age, low socioeconomic status, alcoholism, peripheral vascular disease, and open chronic wounds.^{1,2} Individuals with low socioeconomic status, homelessness, and poor hygiene are particularly susceptible to ectoparasitism. Notably, arthropods such as body lice, ticks, fleas, and fly larvae should be considered possible vectors of bacterial infections (including *W chitiniclastica*) in such populations.^{11,13}

Most patients infected with *W chitiniclastica* received antibiotics, but despite this treatment, fatalities have occurred.⁸ For instance, one patient was reported to have died of invasive infection by *W chitiniclastica* despite prompt antibiotic therapy.^{8,10} Fortunately, *W chitiniclastica* is typically susceptible to β -lactam antibiotics, including penicillins, cephalosporins, and carbapenems.⁸

In conclusion, we report a case of *W chitiniclastica* in California, specifically in a skin cancer patient with chronic open wounds and maggot infestation. Clinicians should be aware of this potential pathogen in high-risk populations, particularly those who do not have good access to regular wound care. The diagnosis is commonly associated with chronic ulcerated wounds but has also been reported in skin malignancies, such as squamous cell and, now, basal cell carcinoma. Keeping chronic wounds covered with breathable bandages to prevent insect access to devitalized tissue may prevent colonization by insect-borne bacteria. Further research is needed to understand the pathogenic progression of *W chitiniclastica* infection in human tissues and whether antibiotic resistance could develop.

Conflicts of interest

None disclosed.

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