

# Traumatic Wound Infection with *Graphium*

Chun-Liang Wu<sup>1</sup> · Chien-Ming Chao<sup>2</sup> · Wei-Ting Lin<sup>3</sup>

<sup>1</sup> Department of Internal Medicine, Chi Mei Medical Center, Liouying, Tainan, Taiwan

<sup>2</sup> Department of Intensive Care Medicine, Chi Mei Medical Center, Liouying, Tainan, Taiwan

<sup>3</sup> Department of Orthopedics, Chi Mei Medical Center, Tainan, Taiwan

*Graphium* species are filamentous fungi and belong to the family of *Ascomycota*. They have been recovered from soil, plant debris, woody substrates, manure, and polluted water, and most of them are plant pathogens. In contrast, human infections caused by *Graphium* spp are extremely rare. Herein, we reported the first published case of *Graphium* traumatic wound infection in an immunocompetent patient. Surgery was performed and amphotericin was added into the antimicrobial regimen for better coverage of the fungus. The postoperative course was smooth, and the patient was discharged uneventfully. This is one of the most extensive series presented in our country. In the developed countries, death rates in burn series have been reported below 5% in recent years, while our mortality rate was found to be 7,37%.

**Keywords:** Wound infection, graphium

## Introduction

*Graphium* species are filamentous fungi and belong to the family of *Ascomycota*. They have been recovered from soil, plant debris, woody substrates, manure, and polluted water, and most of them are plant pathogens (1). In contrast, human infections caused by *Graphium* spp are extremely rare (2-4). Thus, the clinical significance of this pathogen remains unclear due to limited knowledge. Herein, we report the first published case of *Graphium* traumatic wound infection in an immunocompetent patient.

## Case Presentation

A 38-year-old woman presented with painful deformity of the right elbow and right ankle, and severe abdominal pain after an accidental 3-story fall onto her right side. She denied any history of significant medical illness. Her body temperature on arrival was 37°C, pulse rate 85 beats per minute, respiratory rate 20 per minute, and blood pressure of 90/58 mmHg. Physical examination showed cubitus valgus deformity of the right elbow with an open wound and bone exposure (Figure-1), varus deformity of the right ankle, and tenderness in

**Corresponding Author:** Dr. Wei-Ting Lin, Department of Orthopedics, Chi Mei Medical Center, Tainan, Taiwan.

**E-mail:** aapriliaa@gmail.com

**Received:** Dec 18, 2018    **Accepted:** Feb 29, 2018

**Published:** March 29, 2018

This is an Open Access article distributed under the terms of Creative Commons Attribution Non-Commercial License which permits unrestricted non-commercial use, distribution, and reproduction in any area, original work is properly cited.

The Ulutas Medical Journal © 2018



the lower pelvis. Radiography of the right elbow revealed a comminuted fracture of the right supracondylar humerus, Gustilo type-II (Figure-2). In addition, radiography of the pelvis and lower limbs disclosed a comminuted fracture of the right femoral inter/sub-trochanter, right bimalleolar fracture, fractures of the bilateral pubic rami, right transverse process of the L5, and left distal tibia, and a displaced fracture of the left middle fibular shaft. Laboratory studies were as follows: white blood cell count,  $21.5 \times 10^9$  /L with neutrophil predominance (83.8%); serum creatinine, 0.82 mg/dL; alanine aminotransferase, 179 U/L; sodium, 141.3 mmol/L; and C-reactive protein, 103.7 mg/dL (reference value, < 0.8 mg/dL).

**Figure-1.** Deformity of the right elbow with an open wound and bone exposure.



Computed tomography of the whole body revealed liver and spleen lacerations, pelvic fracture and hemoperitoneum. Because of her unstable hemodynamic status and progressive dyspnea, she received aggressive fluid resuscitation, massive blood transfusions and intubation for acute respiratory failure. Emergency

angiography showed petechial hemorrhage in the bilateral internal iliac arteries and liver, and she received successful transarterial embolization to stop the bleeding. Empirical antibiotic treatment with flomoxef was prescribed for traumatic wound infection over the right elbow. After her hemodynamic status stabilized, surgical intervention with repeated wound debridement of the right elbow was done.

**Figure-2.** Radiography of the right elbow shows as a comminuted fracture of right supracondylar humerus and soft tissue swelling.



A sample of the gross turbid discharge with wound tissue was sent for cul-ture, and the wound specimen grew *Graphium* spp. The fungus which was identified by \*MALDI-TOF Mass Spectrometer and had a best identification score of 1.841, which indicated genus-level identification. Thus, amphotericin was added into antimicrobial regimen for better coverage of the fungus. The postoperative course was smooth, and she was discharged uneventfully. Follow-up in the outpatient clinic showed that the wound healed well.

## Discussion

The present report demonstrated an unusual fungus - *Graphium* spp. which caused a traumatic wound infection in an immunocompetent patient. The source of infection could have been the soil where the patient fell. To the best of our knowledge, definite *Graphium* spp.-associated human infections are rare, and only two human cases have been reported previously. In 2007, Kumar reported a case of *Graphium basitruncatum* with a presentation of persistent fungemia and skin lesions in a patient with acute leukemia (2). In 2012, El Feghaly reported a case of *G. basitruncatum* fungemia in a child post stem-cell transplantation.<sup>3</sup> In contrast to previous reports (2, 3), our patient had a traumatic wound infection and no significant immunocompromised condition. As seen in this case, *Graphium* spp. can cause traumatic wound infection in an immunocompetent patient, further expanding the disease spectrum of *Graphium* spp. infections.

In vitro antifungal susceptibility tests showed the MICs for the isolates in Kumar et al.'s report were amphotericin B, 0.5 µg/ml; itraconazole, >16 µg/ml; voriconazole, 8 µg/ml; caspofungin, 2 µg/ml; fluconazole, >64 µg/ml (2), and in El Feghaly et al.'s report, were amphotericin B, 8 µg/ml; itraconazole, >16 µg/ml; voriconazole, >16 µg/ml; posaconazole >16 µg/ml (3). The patient with leukemia was post chemotherapy, and had clinical improvement with liposomal amphotericin B, but the improvement coincided with recovery of neutrophils and was temporary (2). The stem cell transplantation recipient died under treatment with amphotericin and anidulafungin (3). Our patient had a favorable clinical response to amphotericin B and repeated surgical debridement. In summary, the clinical response was different between our

case and previous reports, probably because of the significantly different immune status. Because of limited experience with *Graphium* spp. infections, the optimal antifungal treatment remains unclear. Therefore, further largescale in vitro and in vivo studies are warranted to establish the appropriate treatment guidelines for this unusual fungus.

## Conclusion

In conclusion, we describe the first case of a traumatic wound infection caused by *Graphium* spp. in an immunocompetent patient. Her clinical condition responded well to antibiotics and wound debridement.

## Reference

1. Okada, G. Genus *Graphium*. *J Antibact Antifung Agents* 1994; 22: 45-54.
2. Kumar D, Sigler L, Gibas CF, Mohan S, Schuh A, Medeiros BC, et al. *Graphium basitruncatum* fungemia in a patient with acute leukemia. *J Clin Microbiol* 2007;45:1644-1647.
3. El Feghaly RE, Sutton DA, Thompson EH, Fu J, Wickes BL, Al-Zubeidi D, et al. *Graphium basitruncatum* fungemia in an immunosuppressed child post stem-cell transplantation. *Med Mycol Case Rep* 2012;1:35-38.
4. Apostol JG, Meyer SL. *Graphium* endophthalmitis. *Am J Ophthalmol* 1972;73:566-569.