

## INTRODUCTION

- Osteomyelitis is present in 50% of severe infectious processes of diabetic foot infections<sup>1</sup> and a leading cause of nontraumatic lower limb amputations.<sup>2</sup>
- The recurrence rate is high even with antibiotic and surgical interventions.<sup>3</sup>
- Fungal osteomyelitis is very uncommon but increasing in incidence, likely due to increased recognition.<sup>4</sup>
- Fungal osteomyelitis is difficult to diagnose and treat, requires a prolonged pathogen-specific antifungal treatment for 6-12 months, and is associated with poor outcomes.<sup>5</sup>
- While fungal osteomyelitis has been caused mainly by *Candida* species, osteomyelitis due to *Trichosporon* species has never been reported.<sup>5</sup>

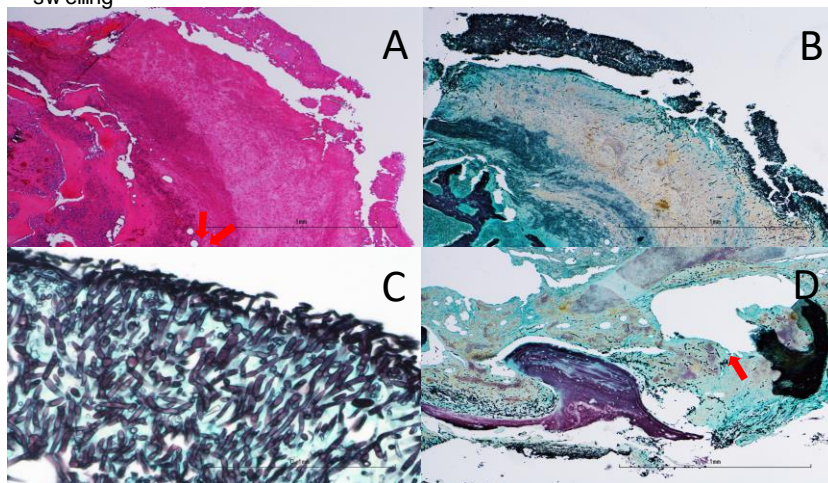
## CASE PRESENTATION

- A 78-year-old female patient with peripheral arterial disease and diabetes developed dry gangrenes complicated by osteomyelitis due to *T. asahii* in the distal phalange of the right hallux.
- The patient initially developed a diabetic foot ulcer on her right hallux after accidentally hitting it on a door, which progressed with dry gangrene and osteomyelitis (Figure 1) despite treatment including oral antibiotics, angioplasty, debridement, povidone-iodine, and collagenase ointment.
- The distal phalange of right hallux nearly auto-amputated and was easily removed by a Kelly blade.
- The bone culture grew *Trichosporon asahii* and the pathology findings were consistent with fungal osteomyelitis (Figure 2).
- She denied any exposure to common fungal sources, and she did not have any systemic symptoms.
- Voriconazole was initiated and resulted in initial pain and erythema improvement; however, her gangrenes extended further, likely because of her nonadherence and co-morbidities.
- She underwent a right foot guillotine transmetatarsal amputation eventually.

## FIGURES



**Figure 1:** Right foot with dry gangrenes in each toe as well as diffuse erythema and swelling



**Figure 2.** Histologic findings of the auto-amputated distal phalange of the right big toe illustrated by hematoxylin & eosin (H&E) stain and Grocott methenamine silver (GMS) special stain.

- A (H&E, 40X): The skin epidermis, dermis and subcutaneous tissue have extensive gangrenous necrosis, and the underlying bone involved by acute osteomyelitis.
- B (40X): There are abundant fungal organisms highlighted by GMS special stain predominantly in the epidermis, and superficial dermis.
- C (GMS, 400X): High power of the marked area in panel B demonstrates the copious fungal hyphae with septa indicated by the arrow s.
- D (GMX, 40X): The fungal organisms invade along the joint spaces and extend into the underlying trabecular bone indicated by the arrow, causing auto-amputation.

## DISCUSSION

- We report a case of *Trichosporon asahii* causing osteomyelitis in a patient with diabetic foot ulcer, diagnosed with bone culture and biopsy. Our success in identification of *T. asahii* is a result of sending bone culture and having a good relationship with microbiology and pathology departments.
- Fungal osteomyelitis is uncommon and under-recognized in diabetes foot infections. The prevalent species found in fungal osteomyelitis are *Aspergillus* (43.9%), *Mucormycosis* (31.0%), followed by *Candida* species (10.3%).<sup>6</sup> This is the first case of osteomyelitis due to *T. asahii*.
- Reaching fungal osteomyelitis diagnosis takes a long time as shown that only 10.9% of the cases reached a diagnosis in less than a month,<sup>6</sup> which may be because fungal culture or fungal stain on biopsy specimen may not be performed routinely.
- Trichosporon* species are found in nature, predominantly in soil, and has had a dramatically increased occurrence of infection in recent years, mainly in immunocompromised patients.<sup>7</sup>
- Blood stream infection, respiratory infection, urinary tract infection, skin infection and gastrointestinal tract infection caused *T. asahii* have been reported, however, osteomyelitis caused by *T. asahii* has never been reported.<sup>8</sup>
- Most invasive infections of *T. asahii* start with colonization of mucosal or cutaneous surfaces, are diagnosed by culture, and the azole class of antifungals is recommended for empiric treatment.<sup>8,9</sup>

## CONCLUSIONS

Fungal osteomyelitis should be seriously considered in those with non-healing wounds and other predisposing risk factors for fungal osteomyelitis, and steps should be taken to diagnose fungal osteomyelitis through bone culture, biopsy and imaging. Rare causes of fungal osteomyelitis should also be considered, including *T. asahii*.

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