

First reported case of *Actinomyces funkei* in the lower extremity

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Statement of Purpose

Necrotizing fasciitis infections can be detrimental in any patient, these infections tend to be poly microbial in nature and can pose difficulty in treatment requiring extensive surgical debridement and intravenous antibiotics. These infections pose a greater risk to a large number of the diabetic population who also tend to have other co morbidities such as kidney disease, neuropathy and peripheral arterial disease. In the present case, we report on a 56 year old diabetic female who presented with an aggressive gas forming infection which cultures grew back *Actinomyces funkei* and *Staphylococcus capitis*. As far we are aware this is the first reported case of *Acintomyces funkei* in the lower extremity as well as the first reported case of in the United States in the literature. The patient required multiple extensive surgical debridement's, long term intravenous antibiotics, and extensive wound care. The end result due to the patients poor vascular status after multiple bypass attempts, was a below knee amputation.

Literature Review

Actinomyces species are filamentous gram-positive bacilli, mainly belonging to the human commensal flora of the oropharynx, gastrointestinal tract and urogenital tract (1). *Actinomyces funkei* was first isolated and described from clinical specimens in the year 2001 from three human samples (2). All reported cases of *Actinomyces funkei* have been isolated from poly microbial infections (4). Prolonged bacterial cultures in anaerobic conditions are necessary to identify the bacterium and typical microscopic findings including necrosis with yellowish sulfur granules and filamentous gram positive fungal like pathogens (1). No reports of *Actinomyces funkei* have been reported in the United States and the most recent case reported in the literature was in the United Kingdom in a case of Fournier's gangrene in which required extensive surgical debridement as well as intravenous antibiotics.

Case Study

A 56 year old female with a history of DM, CKD, PAD, GERD, peripheral neuropathy presented to the ED with the complaint of pain, redness and swelling to her left foot. Patient has an extensive surgical history with over 5 peripheral arterial stent procedures in each leg and multiple foot surgeries. Patient was originally seen by an outside physician who diagnosed her with gout and placed her on indomethacin. On physical exam, localized erythema was noted to the dorsum of the left forefoot extending to the ankle with fluctuance palpable mass noted with ascending cellulitis and proximal streaking noted. Pain on palpation was noted over the dorsum of the left foot. Dorsalis pedis and posterior tibial pulses were non palpable bilaterally with capillary refill time less than 6 seconds. A 1st digit amputation was to the left hallux. A hyperkeratotic lesion was also noted sub 1st metatarsal head.

Case Study



Figure 1. Initial pre operative x rays



Figure 2. Initial pre operative x rays



Figure 3. Initial pre operative x ray

Left foot x rays (Figure 1 - 3) showed extensive edema on the dorsum of the left foot as well as extensive soft tissue emphysema tacking along the dorsum of the left foot extending from the distal forefoot to the anterior ankle indicative of cellulitis with aggressive gas forming pathogen and high suspension of necrotizing fasciitis with chronic osteomyelitis. Patients LERNEC score was at 12 points being over 90% likely for necrotizing fasciitis. Ultrasound of the soft tissue showed extensive soft tissue edema and an echogenic foci concerning for air also concerning for necrotizing fasciitis or gas forming pathogen (Figure 4 - 6). Patient was planned for incision and drainage with wide excision and debridement. Patient underwent multiple debridement's while on continued IV antibiotics.

Case Study

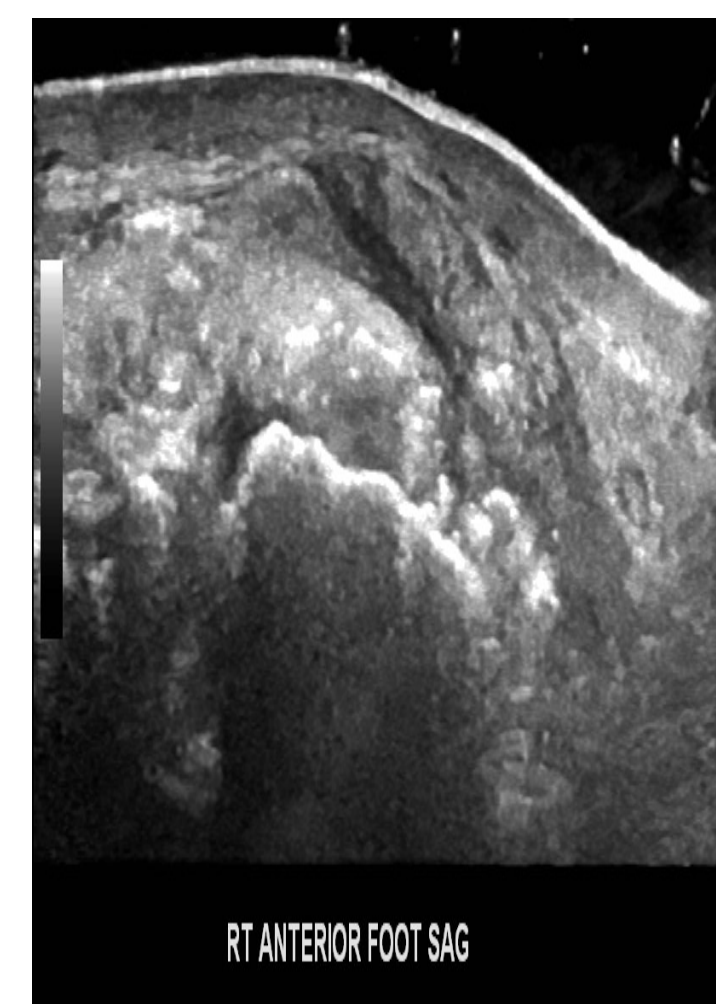


Figure 5. Initial pre operative ultrasound

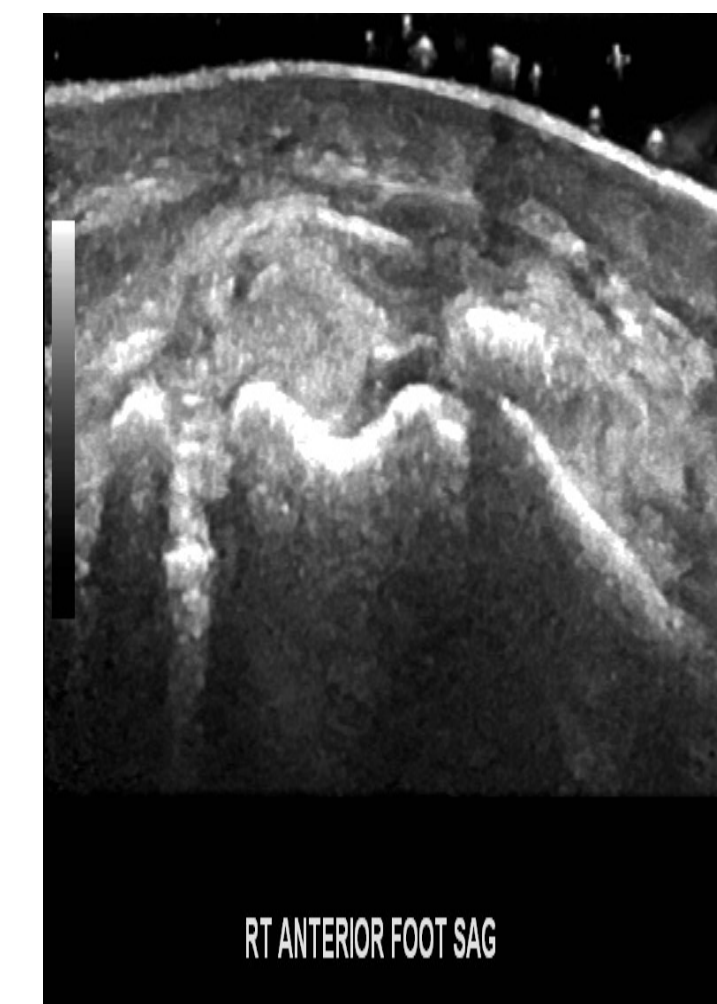


Figure 6. Initial pre operative ultrasound



Figure 7. Clinical picture before delayed primary closure



Figure 8. Clinical picture POD 3 following delayed primary closure

Results



Figure 6. Clinical picture POD 10 following delayed primary closure

Piperacillin/Tazobactam and Vancomycin provided excellent coverage for treatment of the complicated *Actinomyces funkei* infection. After one week, Vancomycin was discontinued. The patient was then placed on Piperacillin/Tazobactam outpatient for 6 weeks. The patient continued with multiple intraoperative and in office debridement's. Bone biopsy's preformed were negative for osteomyelitis. The patients vascular status continued to deteriorate. Multiple attempts at revascularization failed. The continued deterioration of the patients vascular status resulted in a recommendation of a below knee amputation per the vascular team. The patient underwent a BKA, which healed uneventfully.

Discussion

As far we are aware this is the first reported case in the lower extremity as well as the first reported case of *Actinomyces funkei* in the United States. The patients infection was treated with broad spectrum antibiotics which resulted in a favorable outcome, however the patients poor vascular status resulted in the below knee amputation. As far as necrotizing fasciitis infections, they can be detrimental in any patient, these infections tend to be poly microbial in nature and can pose difficulty in treatment requiring extensive surgical debridement and intravenous antibiotics. These infections pose a greater risk to a large number diabetic patients who also tend to have other co morbidities such as kidney disease, neuropathy and peripheral arterial disease and microvascular disease.

References

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