Corynebacterium Striatum: A Concerning Pathogen of Osteomyelitis in the Diabetic Patient

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INTRODUCTION

- *Corynebacterium striatum(C. striatum)* is a gram positive bacteria classified as a Diphtheroid given that it is commonly nonpathogenic.
  - ✓ Diphtheroids are known to colonize skin and mucous membranes.
  - ✓ Diphtheroids are not routinely speciated when isolated on wound and bone cultures.
  - ✓ The clinical significance of the constant presence of Diphtheroids is not well understood with regards to diabetic foot infections and osteomyelitis.
- Few studies have been published addressing the presence of *C. striatum* in the setting of diabetic foot osteomyelitis.
- To our knowledge, no studies have been published reporting the presence of *C. striatum* as a pathogen on bone cultures.

METHODS

- **Participants**

Total # of Patients	4
Male Patients	66.67%
Female Patients	33.33%
Diabetes Mellitus	100%
Neuropathy	100%
Average Age	68.25

- **Procedure:**
  - Patients were included if they exhibited a diabetic foot wound of at least three months duration that failed to heal with local wound care and intermittent antibiotic therapy.
  - All patients included had diabetic neuropathy.
  - Retrospective review of all patient charts was completed with attention directed towards the following:
    - Duration of local wound care
    - Previous wound and bone cultures
    - Antibiotic therapy for soft tissue infection
    - Antibiotic therapy for osteomyelitis
    - Surgical interventions
- All patients were primarily treated by one wound care specialist[3] and one infectious disease specialist[2].
- All patients were treated with local wound care, antibiotic therapy, and surgical intervention.
- All patients were followed until complete wound closure.

RESULTS

Case 1:

- 72 y/o male presented with a dorsolateral foot wound that failed to heal with local care over 3 months.
- Multiple wound cultures taken revealed Diphtheroids which were not speciated. All initial antibiotic therapy was aimed at treating other isolated pathogens.
- The patient underwent surgical intervention for infection control & bone biopsy for culture.
- Surgical wound & bone cultures revealed *C. striatum* resistant to previous antibiotics the patient had received for extended periods of time.
- Proximal margins taken during surgery were noted to be negative for osteomyelitis denoting surgical cure. He was then treated with IV and then oral antibiotics aimed at *C. striatum* for a total of 6 weeks. He was followed until complete wound closure.

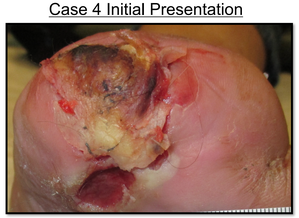
Case 1 Initial Presentation

Case 1 Final Visit

Case 2:

- 65 y/o female with sub-metatarsal five wound which failed to respond to local wound care and antibiotic therapy aimed at treatment of soft tissue infection.
- Wound cultures taken throughout initial treatment period revealed Diphtheroids which were not speciated. Again, initial antibiotic therapy was aimed at treating other isolates.
- The patient underwent surgical incision and drainage with bone biopsy which was sent for bone culture. Bone cultures revealed Diphtheroids which speciated to *C. striatum* in addition to other isolates.
- *C. striatum* was resistant to all previous antibiotics utilized to treat this patient.
- She received IV antibiotics for 6 weeks aimed at *C. striatum* treatment and was followed until complete wound closure.

Case 4 Initial Presentation



Case 4 Final Visit

Case 3:

- 65 y/o male presented with a left hallux wound of 2 months duration. He was treated with local wound care for 3 months and failed to heal.
- Multiple wound cultures taken revealed Diphtheroids and bone culture taken at initial surgery also revealed Diphtheroids which were not speciated or treated.
- He underwent multiple surgical interventions and extended courses of antibiotics for treatment of other isolates.
- The patient eventually underwent left hallux amputation at which time bone cultures were taken and resulted in *C. striatum.*
- He was treated with an extended course of IV antibiotics post-operatively and followed until complete wound healing.

Case 4:

- 71 y/o male presents with a non-healing left plantar foot wound. He failed to heal with at least 3 months of local wound care and intermittent antibiotic therapy.
- The wound was cultured multiple times prior to surgical intervention and noted to result with Diphtheroids, that were not speciated.
- Given progressive worsening of the wound, surgical intervention was carried out. Bone cultures taken resulted in Diphtheroids which speciated *C. striatum.*
- He was treated with antibiotics for >6 weeks post-operatively and followed until complete healing of the left plantar foot wound.

DISCUSSION

- All patients included in this series consistently displayed wound cultures that previously resulted with Diphtheroids. Given that Diphtheroids are not commonly thought to be pathogenic with regard to diabetic foot infections, speciation was not carried out early during treatment. Later, speciation of Diphtheroids consistently resulted with *C. striatum* in wound and bone cultures.
- These patients exhibited wound healing with treatment of *C. striatum* with surgical intervention and antibiotic therapy.
- *C. striatum* may be found as a contaminant in the immunocompetent patient, but may warrant treatment if noted in the immunocompromised patient, such as those with diabetes mellitus.
- *C. striatum* has been reported to cause osteomyelitis in other anatomic locations in patients who are immunosuppressed. Therefore, it is highly likely that in the immunosuppressed diabetic wound patients, *C. striatum* that is isolated, may warrant further work-up and treatment during early presentation.

CONCLUSION

- We report four cases of diabetic foot osteomyelitis with *C. striatum* noted as the causative agent shown with positive bone cultures.
- To our knowledge, this is the first study to report *C. striatum* osteomyelitis in the setting of diabetic foot wounds/infections.
- Our findings suggest that clinicians should consider *C. striatum* as a possible cause of osteomyelitis, especially when patients fail to heal diabetic foot wounds, that have previously and repeatedly displayed Diphtheroids from bone cultures.

References

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