

### Statement of Purpose

The purpose of this case study is to present an unusual occurrence of 5th finger septic arthritis and tenosynovitis (L) and abscess of foot (R) requiring multiple Incision and Drainage, likely secondary to dental cleaning leading to septicemia and hematogenous seeding.

### Procedures

**Procedure #1:** Left small finger excisional debridement of subcutaneous tissue, extensor tendon, and PIP joint capsule. Irrigation of small finger PIP joint, Performed by orthopedic surgery.

**Procedure #2:** Right Foot I&D; Findings: extensive amount of purulent drainage in dorsal and plantar compartments of foot as well as within the sinus tarsi and calcaneocuboid joint. Culture, anaerobic and aerobic (swab from foot) collected. Upon reaching a point where no purulent drainage was able to be expressed from any of the 5 incisions, using a pulsed lavage the incisions were flushed with 3000 mL of normal saline. This was followed with flushing the wounds with 450 mL of Irrisept solution. It was determined at this time that the wounds would need to be packed open. 2 g of vancomycin powder was mixed with 1-inch iodoform packing at this time. All 5 incisions were packed with the iodoform packing and left open.

**Procedure #3:** Right Foot I&D with Closure

Interval MRI reveals significant improvement since previous MRI; however, a 1.2 x 1.2 x 1.7 cm fluid collection noted medial to calcaneus

**Procedure #4:** Right Foot I&D

**Procedure #5:** Right Ankle I&D; Excision of Wound 2 cm Right Ankle

### Case Study

The patient is a 69-year-old female with significant past medical history of adenoma of right adrenal gland, hyperlipidemia, major depression, prediabetes. She initially presented to the ED 5 days prior for right foot swelling (Fig. 1). She relates that 2 days later, she had left hand swelling and blistering of her left 5th digit (Fig. 2). Patient relates that currently the swelling has not worsened since initial presentation in ED. She relates that she is unable to bear weight on the right leg. She denies any trauma to the right foot or left hand. She denies any previous diagnoses of gout, RA, psoriasis. She relates that a rheumatologist is supposed to see her. She relates that ortho might do an I&D of her left hand the following day. She denies any N/V/F/C, SOB or chest pain. She denies any other pedal complaints. Patient reports of dental cleaning around 2-3 weeks ago. Infectious Disease believes this is likely the source of septicemia and hematogenous seeding to the joints. MRI Foot Right W WO Contrast ordered at time of consultation reveals at the plantar aspect of mid foot there is a rim enhancing fluid collection measuring 1.4 x 1.0 x 6.3 cm, indicating an abscess. At plantar aspect of the forefoot at medial aspect there is a rim enhancing fluid collection measuring 0.8 x 2.2 x 1.0 cm, indicating a 2nd abscess. At the dorsal aspect of the hind foot there is a rim enhancing fluid collection measuring 4.1 x 1.3 x 3.7 cm, also indicating an abscess with several smaller adjacent abscesses/phlegmons (Figs. 3 and 4). The patient was taken to the OR for Right Foot I&D. 5 total incisions were made (Figs. 5 and 6), incisions were flushed and irrigated, and packed open with 2 g of vancomycin powder and iodoform packing. Returned to OR 4 days later for Right Foot I&D with Closure. 7 days s/p Right Foot I&D with Closure, patient still having continued pain and swelling. Interval MRI Foot Right W WO Contrast obtained. Significant improvement since previous MRI; however, a 1.2 x 1.2 x 1.7 cm fluid collection noted medial to calcaneus. 9 days s/p Right Foot I&D with Closure, returned to OR for Right Foot I&D. 6 days later, return to OR for Right Ankle I&D; Excision of wound 2 cm right ankle. 4 days s/p Right Ankle I&D; Excision of wound 2cm right ankle patient relates improvement in pain level. 5 days s/p Right Ankle I&D; Excision of wound 2 cm right ankle, patient discharged to SNF. The patient spent a total of 29 days in the hospital.



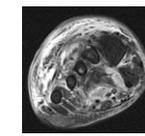
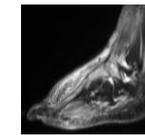
Fig. 1: Initial presentation of R foot



Fig. 2: Initial presentation of L 5th digit, Hand



Figs. 5 and 6: Clinical presentation at 1<sup>st</sup> post-operative dressing change



Figs. 3 and 4: Initial MRI R Foot demonstrating multiple fluid collections i.e. abscesses

### Analysis and Discussion

Due to the unusual clinical presentation associated with GAS as mentioned by Brook et al., this can involve swelling and tenderness. Lacking the commonly associated clinical manifestations of infection including erythema, calor and often clear portals of entry it's common for GAS to be missed on initial presentation. When conservative workup of negative x-ray and constitutional symptoms is encountered, suspicion for underlying infection should be considered. Detailed history to include procedures involving any variation of dental work is of necessity, as shown by the incidence of GAS from the oral cavity site. Advanced imaging is imperative for diagnostic diagnosis of pathological infection and surgical planning to drain and excise all tissue affected by necrotizing fasciitis secondary to GAS. In the case of our patient, time was of the essence as this patient was in the demographic considered elderly that has poor mortality outcome.

### Literature Review

Xiaoqing et al., related that the oral cavity can act as the site of origin for dissemination of pathogenic organisms to distant body sites. Poor oral hygiene can increase numbers of bacteria colonizing the teeth 2-10 fold, thus introducing more bacteria into tissue and the bloodstream. Yumoto et al., illustrated that two major pathways by which oral bacterial infectious diseases affect systemic disease. Bacteremia as a direct pathway, oral bacteria residing in the oral cavity invaded blood vessels in dental pulp and periodontal tissues and then reach not only the heart but also the large blood vessels and various organs to cause systemic diseases. Respiratory being the other. Systemic diseases can include arthritis, necrotizing fasciitis, osteomyelitis, impetigo, cellulitis, pyoderma. Brook et al., obtained 83 specimens from patients with necrotizing fasciitis from June 1973-1990. 14 of those specimens were from the leg. Clinical presentation involved swelling and tenderness. Intensive surgical and medical therapy that includes the administration of IV fluids and management of septic shock are the hallmarks of treatment for NF. From 2005-2012 Nelson et al., reviewed the epidemiology of Invasive group A streptococcal infections in the United States. 9,557 cases were identified, 1,116 deaths (11.7%). GAS most frequently isolated from joint spaces 766 cases (8%), bone 175 cases (2%), muscles 172 (2%), 70% of elderly patients presenting with STSS alone and 56% of those with NF as their only syndrome died of their infections. Interesting to note, they correlated consistent seasonal patterns of invasive GAS infections with a peak in winter and early spring.

### References

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