

Massive Gas-forming Gangrene in a Diabetic Foot Infection

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Clinical Image

This 63-year-old woman with type 1 diabetes on hemodialysis burned her heel three months previously. Despite surgical debridement and topical silver sulfadiazine the wound worsened, with the development of purulent secretions and fever to 39°C, leukocytosis (35,900/mL), an elevated c-reactive protein (420 mg/L), but with a low creatine kinase (20 IU/L). Repeated aerobic and anaerobic cultures of wound tissue grew only *Streptococcus agalactiae*, *Staphylococcus aureus* and *corynebacteria* (unspciated). She was treated with intravenous meropenem and vancomycin, but infection progressed and she was transferred to our hospital.

Examination of her foot revealed erythema, warmth, purulence, crepitus, and wet gangrene (Figures 1 and 2). Examination of the affected foot revealed sensory peripheral neuropathy but no circulatory impairment. Plain radiographs showed massive gas in the entire foot (Figure 3). Computed tomography confirmed extensive gas, making the plantar aponeurosis clearly visible (Figure 4).

She underwent immediate aggressive operative wound debridement, and then repeated bedside debridement. Repeat bacterial cultures of wound tissue grew only *Streptococcus agalactiae* and coagulase-negative *Staphylococcus*. Clindamycin was added to the meropenem and vancomycin therapy. Over 6 months her infection resolved and the foot healed without amputation (Figure 5).

Gas-forming gangrene is an uncommon, but potentially catastrophic, clinical presentation of diabetic foot infection. It is often misdiagnosed as clostridial gas gangrene, leading to rapid, but potentially unnecessary amputation before definitive diagnosis. While gas-forming infections



Figure 1:



Figure 2:



Figure 3:

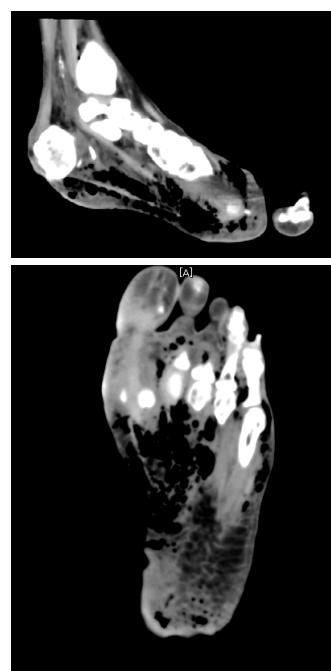


Figure 4:

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Figure 5:

may be caused by *Clostridium* species, those in the diabetic foot are more often associated with mixed aerobic (and sometimes anaerobic bacteria) and usually have a more gradual progression and better prognosis. Successful treatment with limb preservation requires rapid and accurate clinical and microbiological diagnosis, urgent surgical

debridement, appropriate antibiotic therapy and sometimes hyperbaric oxygen therapy. In our patient treatment with extensive debridement and clindamycin, which suppresses staphylococcal and streptococcal toxin production, likely helped salvage her foot.

References

1. Bessman AN, Wagner W (1975) Nonclostridial gas gangrene. Report of 48 cases and review of the literature. JAMA 233: 958-963.
2. Brucato MP, Patel K, Mgbako O2 (2014) Diagnosis of gas gangrene: does a discrepancy exist between the published data and practice. J Foot Ankle Surg 53: 137-140.
3. Finkelstein B, Kamble R, Ferdinando E, Mobarakai N (2003) Autoamputation of the foot caused by untreated gas gangrene: a case report. J Foot Ankle Surg 42: 366-370.
4. Lipsky BA, Berendt AR, Cornia PB, Pile JC, Peters EJ, et al. (2012) Infectious Diseases Society of America clinical practice guideline for the diagnosis and treatment of diabetic foot infections. Clin Infect Dis: e132-e173
5. Russell NE, Pachorek RE (2000) Clindamycin in the treatment of streptococcal and staphylococcal toxic shock syndromes. Ann Pharmacother 34: 936-939.