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PURULENT PATHOLOGICAL MANIFESTATIONS OF THE FOOT IN SEVERE MANIFESTATIONS OF DIABETES MELLITUS

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Annotation: This article discusses some aspects of purulent pathology of the foot in diabetes mellitus.

Keywords: Purulent foot pathology, diabetes mellitus, treatment, diagnosis, method.

INTRODUCTION

A 60-year-old man with poorly controlled type 2 diabetes mellitus and associated neuropathy presents to his family doctor with a wound on the plantar aspect of his left foot. He has no history of foot ulcers. The ulcerating wound, which has been present for 6 weeks, has recently become purulent and foul smelling. The physician feels underlying bone when probing the ulcer with a sterile instrument. A superficial swab of the wound is performed, from which methicillin-susceptible *Staphylococcus aureus* and *Pseudomonas aeruginosa* are isolated. The physician considers the relevant components of the management of this patient's condition.

MATERIALS AND METHODS

Not all foot ulcers in patients with diabetes are infected. However, this patient's history and physical examination are suggestive of a mild to moderate diabetic foot infection (Table 1). At least 2 signs of inflammation (i.e., erythema, warmth, pain, induration or purulence) should be present to diagnose a diabetic foot infection. Factors shown to increase the risk of a diabetic foot infection include a history of diabetic neuropathy, recurrent ulcers or ulceration for more than 30 days, traumatic wound, peripheral vascular disease in the affected limb (e.g., ankle bra- chial index < 0.9) and renal impairment [1].

RESULTS AND DISCUSSION

This patient is hemodynamically stable with a new diagnosis of a diabetic foot infection. A proper wound culture should be done before antibiotic therapy is started. Swabs of the superficial surface of the ulcer are inadequate and are generally discouraged. Such samples are prone to contamination with commensal and colonizing organisms (such as *Pseudomonas* species and methicillin-resistant *S. aureus*) and will often fail to detect the true deep-tissue pathogens [2].

The duration of recommended antimicrobial therapy is determined by the extent of the infection, specifically whether there is underlying osteomyelitis. In the absence of complication (e.g., abscess or osteomyelitis), treatment for 7– 10 days is usually sufficient, although longer courses may be recommended for severe infections. In cases of osteomyelitis, treatment is typically for 6 weeks. The ability to probe to under- lying bone with a narrow, hard object is highly suggestive of infection with underlying osteomyelitis (positive likelihood ratio 6.4, 95% confidence interval [CI] 3.6–11). Despite their frequent use in these settings, both erythrocyte sedimentation rate and C-reactive protein level lack sufficient evidence to justify their use in diagnosing osteomyelitis. Plain radiographs, although insensitive for osteomyelitis (sensitivity 0.54, 95% CI 0.44–0.63), are appropriate firstline imaging tests and may also show underlying soft-tissue gas or foreign bodies [3]. Magnetic resonance imaging (MRI) should be done if radiographs appear normal but suspicion of osteomyelitis remains high, or if there is suspicion of soft-tissue abscess.

CONCLUSION

This patient should be informed that his wound may persist after he has finished the course of antibiotics. Frequent reassessment with débridements will assist in eliminating any potential pathogenic

reservoir and promote the formation of granulation tissue.

Table 1: Classification of severity and microbiological considerations in diabetic foot infection

Severity	Characteristics	Common causative pathogens
Mild		
Local infection involving epidermis and subcutaneous tissue	Local signs of inflammation in the absence of systemic signs and symptoms	Aerobic gram-positive cocci
Moderate		
Infection involving tissue deeper than epidermis and subcutaneous tissue	Local signs of inflammation with erythema > 2 cm in the absence ofsystemic signs	Acute, less extensive: aerobic gram-positive cocci Chronic, more extensive: gram-positive and gram-negative organisms, anaerobes
Severe		
Local infection with signs of systemic inflammatory response syndrome*	Hemodynamic compromise, metabolic disturbances (severe hyperglycemia, new onset renal insufficiency)	Gram-positive organisms (including MRSA), gram-negative organisms, anaerobes
Special considerations		
	Exposure to antibiotic agents in theprevious 1 mo	Gram-negative bacilli
	Previous history of MRSA infection or colonization within the last year, high local prevalence of MRSA, severe infection or prolonged wound	MRSA
	Frequent exposure to water, high local prevalence, warm climate	*Pseudomonas aeruginosa*

Note: MRSA = methicillin-resistant *Staphylococcus aureus*.
*The presence of more than 2 of the following signs and symptoms: temperature higher than 38°C or lower than 36°C; heart rate faster than 90 beats/min; respiratory rate faster than 20 breaths/min; partial pressure of carbon dioxide less than 32 mm Hg; leukocyte count greater than 12 or less than 4 cells/mL, or more than 10% bands.

CONCLUSION

This patient should be informed that his wound may persist after he has finished the course of antibiotics. Frequent reassessment with débridements will assist in eliminating any potential pathogenic reservoir and promote the formation of granulation tissue.

Pressure off-loading, improved glycemic control and ensuring adequate vascular supply to the limb are also important in wound healing. Adjunctive therapies such as hyperbaric oxygen, maggots and vacuum-assisted closure devices lack sufficient data at this time to be recommended as part of routine therapy. Multidisciplinary care by physicians, wound care experts and chiropodists to detect any new ulcers and

prevent future infections hasbeen shown to substantially reduce the rate of subsequent amputations, and its importance can-not be overemphasized.

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