



POSNA

The Core Curriculum

Puncture wounds of the foot

Objectives

1. Describe the natural history of an untreated puncture wound of the foot the 1) penetrates only soft tissue, and 2) penetrates the metatarsal head
2. Describe the incidence of cellulitis and osteomyelitis after initially treated puncture wounds of the foot
3. Discuss the role of footwear in the genesis of Pseudomonas osteomyelitis of the foot secondary to a puncture wound
4. Describe a treatment plan for 1) initial management of a puncture wound of the foot, and 2) delayed presentation of a clinically inflamed great toe following a puncture wound

Discussion points

1. What is optimum initial management for an innocent appearing puncture wound? For an obviously dirty wound?
2. What is the risk of osteomyelitis if the patient sustaining a puncture wound is barefoot?
3. What is the data base for current recommendations for antibiotic management of osteomyelitis secondary to puncture wounds?
4. What is the effect of delayed diagnosis on prognosis?
5. Are laboratory studies valuable in the assessment of osteomyelitis following puncture wound?

Discussion

Since the 1960's, a number of reports of puncture wound of the foot have clearly established the pathogenesis and management of this entity. 98% of puncture wounds result from stepping on a nail. Cellulitis subsequently develops in 8-15%, osteomyelitis in 0.6-1.8%. The prevalence of Pseudomonas as the offending organism appears to be a result of its presence in the sole of tennis shoes; although it has also been found in work boots, any warm moist environment can foster its presence. There are no fixed protocols for the initial management a puncture wound; debridement and irrigation with a 19G needle have been recommended. Especially dirty wounds do warrant initial debridement. Soft tissue infections are generally secondary to staph aureus, and bone or cartilage are secondary to pseudomonas, so no antibiotics are indicated at the time of injury. Laboratory values are normal and are not helpful. Typically, the patient will re-appear at 2-3 days or later if cellulitis or osteomyelitis has occurred. Wound exploration is indicated and if bone or joint infection has occurred, one of the newer beta-lactam antibiotics are usually administered, ceftazidime is presently favored. The duration of therapy necessary has not been established; it is interesting to note that one of the first patients reported with this problem, by Johanson, was treated

only with surgical debridement. A 5 to 7 day course of antibiotics is probably sufficient if adequate debridement has been performed. Prognosis seems directly related to delay in diagnosis after injury. Green and Bruno reported minimal complications with early treatment. If there was a 10 to 14 day delay, there was sometimes residual deformity. A week delay essentially assured residual deformity.

References

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