**Distal Hallux Pain in an Alpine Ski Racer**

Blair DF, Kiser HK, Pauly CE, Pauly SA, Tonge AM, Schoeder SA: Wenatchee High School, Wenatchee, Washington

**Background:** The subject is a 16 y/o female alpine ski racer. She suffered a case of "frostbite" on her right hallux in January 2007 as a result of snug fitting ski boots. This caused an open wound on the distal aspect of her great toe. A doctor examined the wound, which eventually healed after the season concluded in April. In winter of 2008, she tried new boots with multiple modifications to stretch the toe box, but continued to have minor cases of "frostbite." The second major episode occurred in February 2009. Her distal hallux turned purple with a blood-blister under the nail, slight edema, sensitivity, and dark red drainage from the wound. She also discovered a "significant lack of tissue" under the nail, but competed despite this condition. **Differential Diagnosis:** Ewing sarcoma, osteosarcoma, ostoemylelitis, gout, neuroblastoma, pressure osteonecrosis. **Treatment**: The athlete visited her pediatrician who treated the ulcerations and referred her to a podiatrist. The podiatrist's examination included measuring skin temperature (89° F involved side, 80° F contralateral). X-rays revealed erosive changes of the distal medial aspect of the right hallux and a cystic erosion of the distal lateral aspect of the hallux. MRI showed abnormal bone marrow edema and a mild amount of enhancement within the distal phalanx of the hallux. No cultures were obtained due to lack of discharge. Inflammatory markers were normal. Based on the above findings, physicians made a tentative working diagnosis of osteomylelitis. Surgery was performed on 3/19/2009. Dark, necrotic tissue was excised from the distal medial plantar aspect of the hallux. The bone was notably soft in this area. A partial excision of the distal tuft of the right hallux was performed. A bone culture was taken and revealed Streptococcus viridans and Coagulase-negative staphylococcus, confirming the osteomylelitis diagnosis. She was started on Zosyn IV immediately following the surgery. The incision was left open to allow for drainage and debridement, and she returned to the OR for closure of the incision three days later (3/22/2009). Upon release, she started a six-week course of clindamycin. The athlete progressed from non-weight bearing to a walking boot within the first week. She underwent rehabilitation to improve the function of her toe and was able to resume pain-free activities soon after. Her follow-up rehabilitation includes functional multi-planar core strengthening workouts with an ATC twice a week. **Uniqueness:** The question of why there was a two-year gap between the initial "frostbite" and the surgery/diagnosis is puzzling. It is still not clear if the initial ulceration was caused by cold injury alone or in conjunction with constant pressure to the area. The open lesion was an avenue for the bacteria to enter the tissue and infect the bone. We also question the point at which the bacteria actually entered the area. Did it "wall" itself off and lie semi-dormant for nearly two years, or was the first lesion solely cold/pressure related and the infection entered through the February 2009 lesion weeks before the diagnosis? Although final lab cultures definitively diagnosed the osteomyelitis, some of the soft tissue and bony pathology may be the result of pressure necrosis. **Conclusions:** The athlete returned to full activity and ski racing in June 2009. She noticed a slight deficit in balance, has

some difficulty transferring power through her great toe, and still has slight pain on the distal tip of the toe, especially with direct pressure. She is presently rated in the top three female ski racers in her age group in the Pacific Northwest and top 20 nationally. She actively trains six days per week and continues to race with high aspirations.

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