

Invited Speaker Abstract

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Stress fracture pathophysiology

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Stress fractures in bone result from repeated application of loads below the fracture threshold. They are not associated with a specific history of trauma. Rather, they are frequently reported in soldiers, ballet dancers, joggers and other individuals who have increased their levels of repetitive-type physical activities. As such they have often been regarded as a mechanical fatigue-driven process. However, stress fractures also occur as a result of more moderate loading circumstances as seen in older individual, implicating processes other than mechanical fatigue. Thus, their pathogenesis is poorly understood. In this talk, we will examine two major hypotheses for cause of stress fractures, i.e., stress fractures as 1) a mechanical-driven process and 2) a biologically-driven process. The roles of biomechanics, bone structural and material properties, and clinical evidence and experimental models will be discussed in context to each of these hypotheses.