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Original Research

The Use of a Tuning Fork and Stethoscope to Identify Fractures

Michael Bryan Moore, PhD, VATL, ATC

Radford University, Radford, VA

Abstract

Context: Nonradiographic tests to identify fractures rely on a patient's report of increased pain at the site of injury. These tests can be misleading and produce false-positive or false-negative results because of differences in pain tolerance. A painless technique using a tuning fork and stethoscope to detect fractures has undergone limited review in the athletic training literature.

Objective: To determine if the use of a 128-Hz vibrating tuning fork and stethoscope were effective in identifying fractures.

Design: Cross-sectional study.

Setting: University athletic training room or local orthopaedic center when fractures were suspected.

Patients or Other Participants: A total of 37 patients (19 males, 18 females) volunteered.

Main Outcome Measure(s): A diminished or absent sound arising from the injured bone as compared with the uninjured bone represented a positive sign for a fracture. Radiographs interpreted by the attending orthopaedic physician provided the standard for comparison of diagnostic findings.

Results: Sensitivity was 0.83 (10 : 12), specificity was 0.80 (20 : 25), positive likelihood ratio was 4.2, negative likelihood ratio was 0.21, and diagnostic accuracy was 81% (30 : 37).

Conclusions: The tuning fork and stethoscope technique was an effective screening method for a variety of fractures.

Keywords: false-negative results, false-positive results, assessment, auscultation

Michael Bryan Moore, PhD, VATL, ATC, provided conception and design; acquisition and analysis and interpretation of the data; and drafting, critical

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Michael Bryan Moore, PhD, VATL, ATC, PO Box 6957, Radford, VA 24142, e-mail: mbmoore@radford.edu

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