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Infrared thermography is useful for ruling out fractures in paediatric emergencies.

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Sanchis-Sánchez E[1], Salvador-Palmer R, Codoñer-Franch P, Martín J, Vergara-Hernández C, Blasco J, Ballester E, Sanchis E, González-Peña R,Cibrián R.
Author information

[1]Department of Physical Therapy, Universitat de València, Valencia, Spain, enrique.sanchis-sanchez@uv.es.

Abstract

Musculoskeletal injuries are a leading cause of paediatric injuries and emergency department visits in Western countries. Diagnosis usually involves radiography, but this exposes children without fractures to unnecessary ionising radiation. We explored whether infrared thermography could provide a viable alternative in trauma cases. We compared radiography and thermal images of 133 children who had been diagnosed with a trauma injury in the emergency unit of a Spanish hospital. As well as the thermal variables in the literature, we introduced a new quantifier variable, the size of the lesion. Decision tree models were built to assess the technique's accuracy in diagnosing whether a bone had been fractured or not. Infrared thermography had a sensitivity of 0.91, a specificity of 0.88 and a negative predictive value of 0.95. The new lesion size variable introduced appeared to be of main importance to the discriminatory power of the method. Conclusion: The high negative predictive value of infrared thermography suggests that it is a promising method for ruling out fractures.

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