

Editorial

Classification of long bone fractures in children

Classification systems have been introduced for a variety of orthopedic conditions over the years, and for many of them—including fractures—several systems have been suggested. More comprehensive classification systems are useful for pooling of data from publications over time, to compare data in different publications. Also, systematic reviews would benefit greatly from a uniformity in terminology. Few classification systems have emerged from systematic development, evaluation, validation, and implementation. It would seem important to involve professional societies and journals to persuade researchers to use validated classification systems when reporting outcomes.

In their systematic review regarding the reliability of reliability studies of fracture classifications, Audigé et al. (2004) concluded that most studies found that fracture classifications were not generally reliable in terms of observer agreement and accuracy. Furthermore, most reliability studies were heterogeneous in their approach and methods of evaluation, and were therefore not without flaws. The authors stated that “the development and adoption of a systematic methodological approach for the development and validation of fracture classifications is needed”.

Audigé et al. (2005) went on to suggest an approach to future development and validation of classification systems in orthopedics. A 3-phase system was proposed:

- Phase 1: Development of the classification system (or revision of an existing system) by clinical experts often involving several classification-modifying iterations, and evaluation of reliability (inter- and intra-rater reproducibility) and accuracy.
- Phase 2: Multicenter agreement studies in clinical practice, involving a large number of cases and numerous raters representing multiple levels of expertise. At the end of this phase, investigators should be able to agree that the system is acceptable; otherwise further modifications will be needed.
- Phase 3: A prospective clinical observational phase, conducted to assess the clinical relevance and usefulness in terms of prognosis and treatment. This phase should ideally include several prospective clinical studies to corroborate the robustness of the system.

The first comprehensive fracture classification system was published in 1990 by the AO group, and was merged with the Orthopaedic Trauma Association (OTA) classification and developed further (Marsh et al. 2007). It was hoped that the classification would lead to better patient care and encourage clinical research.

Building on this work, an international AO workgroup led by Theddy Slongo developed the fracture classification system for long bone fractures in children, and published their phase-1 observations in 2006 (Slongo et al. 2006). Phase-2 observations were published the following year (Slongo et al. 2007), together with the publication of the comprehensive AO-OTA adult fracture classification.

The current issue of *Acta Orthopaedica* has 3 articles concerned with the classification of long bone fractures in children (Joeris et al. 2017a, b, Audigé et al. 2017). The reliability and accuracy of this comprehensive children’s fracture classification have previously been reported (Slongo et al. 2006). 2 of the 3 current studies represent early phase 3 evaluation, while the one on multifragmentary long bone fractures is a phase-2 evaluation. We look forward to further expansion of the phase-3 documentation incorporating a collection of prospective data, preferably from several clinics to relate the classification to prognosis and treatment. The most important claim, that a comprehensive classification will lead to better patient care, remains to be firmly established.

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