Fracture classification

A response to Bernstein et al

Bernstein and his coworkers have taken a novel approach to the classifications of fractures. The basis is that they should lead to a defined treatment, and that a separate categorisation of the unique identity of the injury should allow meaningful evaluation of outcome. This could be seen as a futile intellectual exercise, or as stimulation for us to review how and why we try to classify fractures. The latter is undoubtedly the approach to adopt.

The grade-C classification of Bernstein et al is clearly useless to any thinking fracture surgeon, but the grade-B classification is their largest group and could, perhaps, serve as a baseline from which we can progressively develop any future systems.

Their grade-A classification has stringent criteria. The Oxford English Dictionary defines 'to classify' as "to arrange or distribute in classes according to a method or system". They claim to have evaluated 66 systems of fracture classification. There is not that number of true systems: rather there are many arbitrary codifications of ranges of types of fracture at single anatomical sites. For example, the Garden 'classification' of fractures of the femoral neck is not part of a wider system. It is relatively easy, however, to construct a Garden-type classification for other fractures and pair the findings one-to-one with unique treatments. This would create a grade-A clinical classification.

Their theoretical goal is to devise a broad system, but this is unsustainable in the long term for a variety of reasons. First, we are still unable to match a unique injury with a proven regime of treatment. Injuries are so protean as to be almost infinitely variable; there cannot be a group identity and many of our treatments are empirical and insignificantly tested. Secondly, as the authors rightly state, if such a system was available it would lead to fundamental changes in therapeutic attitudes and possibly self-destruct. Any future system of fracture classification will be a compromise. It will need to be dynamic and capable of evolution in the light of advancing knowledge.

The chosen system should have a number of levels through which the classifier may descend, each layer contributing more to the uniqueness of the expression of the injury. The upper layers should provide a working identity for the fracture and serve as the basis on which the surgeon may practise his art. Let us never forget that surgery is just that. To attempt to define surgery as pure science is a delusion; it is a scientific art and any classification will remain a tool in the hands of the artist. The acceptance of compromise is not failure but should be a foundation on which to build.

Analysis of the lower and progressively more focused levels of such a system would enable the expression of the ultimate uniqueness of the injury in a way which is detailed enough for fracture researchers. The AO system of Müller et al is designed in this way, and it has stood up reasonably well to the test of clinical practice. It is now in common use in major fracture centres, has been accepted by major trauma journals, and represents a major step forward in defining a fracture for both clinical and research purposes.

It is a system and therefore learnable; its upper layers are certainly memorable. The first two digits, which define the anatomical site, have not entered the everyday parlance of the fracture surgeon, but the ABC groups and their numerical subgroups are commonly used in clinical communication. One would not expect to hear of a comminuted T fracture of 13, but one will often hear of a C3 injury of the distal humerus. Such acceptance must indicate a degree of value in everyday communication as well as in research.

The Müller system is indeed systematic: it offers a structure of levels to serve various needs, it addresses the complexity of the fracture and it is becoming accepted. It does not yet deal well with pure dislocations, or fractures of the patella, the scapula, the hand or the foot. Some malleolar fractures are difficult to categorise and proximal humeral fractures remain a problem. Because a good system is imperfect there is no reason to discard it, but an excellent reason to continue its improvement. We must continue to test the method 'in vitro' and 'in vivo' by using it, in conjunction with soft-tissue grading and validated outcome measures, to construct injury-treatment pairs. This will produce many difficulties, due to the classification itself or to a reflection of poor therapeutic decision-making. This will add to the virtues of the system, extending and refining it by redrawing the partitions to which Bernstein et al refer.

The problem of the unique nature of an injury, referred to by Nicoll as the 'fracture's personality', must ultimately be categorised and expressed in terms comprehensible to both the fracture surgeon and the researcher who needs rapid data manipulation. Bernstein et al end their paper by mentioning, with inappropriate brevity, the need to categorise associated soft-tissue status and associated injuries. This
is at the very heart of giving surgeons the tools which they need.

In 1896, Stanley Boyd\(^3\) of the Charing Cross Hospital in London, made the prophetic statement that “The most important divisions of fractures – simple, compound, complicated - are based upon the condition of the soft parts; less important varieties rest upon the conditions of the bone”. This is now undisputed.

The most common soft-tissue grading in association with fractures is that of Gustilo, Mendoza and Williams.\(^4\) Brumback and Jones\(^5\) have concluded, however, “that interobserver error in the use of the Gustilo-Anderson classification system for open fractures is moderate to poor, that the agreement is case-dependent, and that this method may not be an adequate basis for decisions concerning treatment or for the comparison of published results”. The soft-tissue categorisation used by the AO Foundation is based on the concepts of Tscherne and his Hanover group.\(^6\) It has certain limitations, but provides a springboard for developing a better classification.

The full alphanumeric code which may eventually be assigned to a given injury may well be indigestible to a clinician, although ideal for data processing. It would be reasonably straightforward to link groups of codes with a series of agreed clinical terms for the practising surgeon. It seems infinitely better to do this than to have two parallel classification systems.

Despite my commentary and criticisms, I believe that Bernstein and his coworkers have rendered a valuable service in concentrating attention on the living and dynamic nature of injury classification. Their work will stimulate further progress in this important field.

C. L. COLTON

REFERENCES