INSTABILITY OF THE KNEE RESULTING FROM LIGAMENTOUS INJURY

A PLEA FOR PLAIN WORDS

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The word "obscurity" seems appropriate when discussing instability of the knee resulting from ligamentous injury. The subject is complex enough without introducing semantic pitfalls. The snag is that different authors use different terms to describe the same condition; moreover the words they use are neither self-evident nor devoid of ambiguity.

Take the commonly used phrase "anteromedial complex instability". Those who have mastered its meaning have done so, not by understanding the words themselves, but (after a struggle) from the context and from accompanying diagrams. In themselves the words could be taken to mean that ligamentous laxity permits the femur to move excessively in an anteromedial direction, or that the tibia does so, or that the complex (whatever that is) is itself unstable. Or consider "lateral pivot shift". Does this imply that the pivot (whatever that is) has shifted laterally? In fact it has shifted medially.

No wonder the average reader skims a new article uncomprehendingly, or plods his way painfully to partial understanding. We should, I suggest, not be surprised at this verbal difficulty. The whole subject has only recently emerged from the surgical dark ages, and it would be quite unreasonable to expect that the authors who introduce descriptive terms should, as well as being surgical masters in a new and difficult field, necessarily be masters of communication.

As a non-master in this field, I decided, six years ago, to stand back and look at the scene as a whole; and, having done so, to try to formulate a vocabulary which might avoid the current difficulties. It seemed sensible to begin by using words which were themselves simple, whose meaning was unequivocal, and which were already familiar in a different but related field—that of fractures. A simple way of describing displacement at a fracture is to say that one fragment, relative to the other, has been tilted, shifted or twisted. Thus the lower fragment of a femoral shaft fracture may be tilted backwards or forwards or to either side; it may be shifted backwards or forwards, towards the medial side or

towards the lateral side, or proximally, causing overlap; and it may be twisted so that its anterior surface faces more medially or more laterally.

These words can conveniently be used to describe the abnormal movements of one component (the tibia) in an unduly lax knee.

Tilt. It may be possible to tilt the tibia into varus or into valgus.

Shift. It may be possible to shift the tibia too far forwards or too far back.

Twist. The medial condyle of the tibia may subluxate forwards or backwards; and the lateral condyle likewise.

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Compare these terms with others in current use. Take "anteromedial ligament instability" for example. It needs explanation; in fact it means that the medial condyle subluxates forwards. Then why not say so? Similarly, "anterolateral complex instability" means that the lateral condyle subluxates forwards, "chronic medial ligament instability" that the tibia tilts into valgus, and so on. In each case it is simpler to describe the abnormal movement than to use terms which have to be explained.

Clinical examination should be directed towards demonstrating these abnormal tibial movements, which can of course occur in combination. Describing the movements is more valuable than naming the damaged ligaments, first because debatable assumptions of aetiology are avoided, and secondly because naming the excessive movements immediately points to the needs which treatment aims to satisfy.

Treatment

When it comes to describing the operative treatment for ligamentous laxity, the scope for confusion of meanings is still greater; indeed the phrase "mutually incomprehensible chaos" suggests itself. Can any reader deny that, when he sees a new procedure described (as he does all too frequently) his heart sinks just a little? And he is learned or lucky if, by the time he has finished reading, it has not sunk to rock bottom. Again the problem is largely linguistic and again it may be possible, with simple words, to provide the lifeline he seeks; or at least a few clutchable straws. Expressed simply, the damaged structure can be reattached, reinforced or replaced—the three Rs.

Reattachment in this context implies tightening. It is convenient to think of the capsule and ligaments as a sleeve, and to reattach one or other end in such a way as to take up the slack, so restricting the movement which was excessive. Thus excessive sideways tilt can be reduced by tightening one or other *side* of the sleeve, reattaching it in a vertical direction—the proximal end more proximally, or the distal end more distally. Excessive twist can be reduced by moving the attachment of the sleeve horizontally; thus if the medial condyle subluxates forward, the slack can be taken up by moving the distal attachment of the sleeve further forward, or the proximal attachment further backward (or both). Nicholas' "Five-One-Reconstruction" (*J*

Bone Joint Surg 1973;55-A,899-922), for example, involves moving the lower end of the capsule forwards and distally as well as moving the upper end backwards and proximally.

Excessive forward or backward shift can probably not be corrected by simple reattachment; reinforcement or replacement will be needed.

Reinforcement speaks for itself, but it is useful to remember the two varieties, dynamic and static. Transposing the *pēs anserinus* is a good example of dynamic reinforcement: the corrective force is applied via an active muscle complete with its nerve supply. The pivot shift operation exemplifies a static reinforcement: the strip of fascia lata which is used to tighten and reinforce the collateral ligament probably acts as a tenodesis. Dynamic procedures are less likely to stretch with repeated stress.

Replacement is of three kinds. Thus the anterior cruciate ligament can be replaced by a strip of the extensor mechanism (tendon, bone and ligament) which is rerouted through the lateral femoral condyle and fixed to the tibia; though apparently dynamic this probably acts as a tenodesis. Or the ligament can be replaced by an artificial one made of metal and plastic and positioned along the line of the original ligament; there is of course a tendency for such artificial structures to break or loosen. The third variety is an "induced" ligament: a length of carbon fibre is inserted, aiming to stimulate the formation of ligamentous fibres; this technique is still largely experimental.

The purpose of the three Rs is to encourage simplicity and comprehension. Whenever a "new" operation appears, it is relatively easy with these terms to decide what kind of procedure is being described, and then to see how it differs (if at all) from others in the same category.

In this article I have sought to identify and to describe in plain words what is wrong and what to do about it—that is, the nature of the disability and the procedures needed for its remedy. I have not attempted to detail the technicalities of each procedure, nor have I even mentioned the problems of diagnosing and treating the acute injury. I realise that only when expert primary management is widely available will the problem of instability decline; but my present objective is strictly limited—it is to foster the use of simple and unambiguous terms and thereby to facilitate understanding and communication.