Stiff elbow is a complex and controversial condition whose diagnosis and management are both challenging and demanding. The elbow joint is disproportionately affected by loss of movement following even simple lesions and surgical procedures. It is unclear why the elbow tends to develop stiffness, although the presence of three highly congruent joints in the same capsule and synovial space, lateral and medial collateral ligament tension during the entire range of motion, and the very close relationship between tendons, muscles and skin probably go a long way toward explaining this feature. Accordingly, it is critical to assess the possible involvement of articular and periarticular tissues, particularly the integrity of the articular surface and joint congruency.

Although the transformation of fibroblasts into myofibroblasts appears to explain the development of stiffness at the biochemical level, a greater understanding of the biology of elbow stiffness is needed. Changes in the approach to elbow stiffness over the last twenty years and advances in treatment capacity have suggested new classification criteria, which based on the natural history of the condition afford a more accurate surgical management and a better interpretation of possible clinical outcomes. Elbow stiffness influencing factors, which are extremely important in formulating surgical indications and prognosis, should carefully be taken into account. For instance, the recently developed stiffness types and classification criteria, which based on statistical analysis, help to identify homogenous stiffness patterns thus enabling comparison of different treatments. On the other hand, it is quite common to see patients whose anatomical features and extrinsic/intrinsic or mixed contractures (as suggested by Morrey) can explain the origin of their stiff elbow. According to Morrey, most activities of daily living can be performed within a range of motion of 30°–130° in extension and flexion and of 50° in pronation and supination. The loss of extension compromises the use of the hand in the space around the body whereas the loss of flexion limits its use for grooming and self-care. Clearly, some individuals, such as athletes, have greater requirements: Morrey suggests that spending time with patients to assess their needs, as some patients are happy with uninspiring clinical results and others may be unhappy even with an increased range of motion.

Treating the elbow joint is still a challenge, especially in trauma patients. Notably, heterotopic ossifications and the time spent with elbow stiffness or joint deformities can induce severe clinical changes, but the increased range of motion provided by surgery may involve greater pain as well as the risk of joint instability. Therefore, in some patients whose elbow is pain free and provides a range of motion that meets their daily activities requirements, the possibility of avoiding surgery should be considered, explaining that the risks may not be justified by the possibility of transforming a functional elbow into one with a greater range of motion but with a degree of instability that can reduce the functional capacities. The timing of the excision of heterotopic ossifications is debated and ranges from soon after the first 40 days from the initial trauma to the clear x-ray evidence of its margin. At present the latter is the preferred option, although ongoing research may change our views.

Loss of range of motion can also be determined by ligament contracture, which must be considered especially in patients with calcium deposits in the substance of the tendon. Calcifications in the lateral ligament are different from deposits in the medial ligament and should be removed if they have the potential to affect isometricity, whereas retraction of the posterior bundle of the medial collateral ligament should be managed by tendon release. The ulnar nerve must always be assessed in patients with elbow stiffness, and the symptoms of nerve compression sought and identified. Problems connected with the ulnar nerve have the potential to impair patient outcomes.

Several aspects of elbow stiffness are clearly addressed in these theme issue articles, from clinical observation to the more complex cases that require hemiarthroplasty, interposition arthroplasty, or total arthroplasty. Although the advances in elbow surgery made in the last few years can address numerous problems and conditions, I do feel that further improvement of patient outcomes requires additional research work.

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