

Etiology and Evaluation of Elbow Stiffness

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The elbow is predisposed to developing contractures and stiffness due to its specific anatomy and potential for serious injury. This is due to the high degree of congruency of the joint, close proximity of muscle to joint capsule, propensity for comminuted fractures and unique response of the joint capsule to trauma. Management has improved in recent years due to a better understanding of elbow biomechanics and development of newer surgical approaches and techniques as well as rehabilitation concepts. Understanding the etiology and proper clinical evaluation of the stiff elbow are important in achieving a successful treatment outcome.

The stiff elbow can develop from traumatic, congenial or acquired (arthritis, burns, paralysis, sepsis) conditions. Post-traumatic contractures resulting in elbow stiffness are by far the commonest cause and result from collateral ligament and capsular injury or articular incongruity. The initial force of injury, extent of periosteal stripping, degree of intra-articular involvement and length or immobilization all influence the development and extent of contracture.

Post-traumatic elbow contractures are usually classified as extrinsic – anterior or posterior capsule, osseous bridge or intrinsic – articular adhesions, articular deformity. In most cases, capsular contracture is almost always present. Intrinsic causes usually have extrinsic contractures as well.

The post-traumatic contracture is usually initiated by pain, haemarthrosis or swelling. Subsequent limitation of motion results followed by development of contracture. Mature scar formation or established articular bony deformity eventually results in irreversible change if treated non-surgically. The changes can be characterized in stages: Bleeding (hours), edema (days), early scar formation (weeks), organized fibrous scar (months).

In clinical evaluation, it is important to establish the patient symptoms, required activities of daily living and limitations, the direction of most needed motion (flexion vs extension) and details of previous treatment. Physical examination will determine the degree of contracture, elbow stability/congruency, deformity and presence of neurological problems.

Plain X-rays of the elbow are the only investigations needed in most cases. A tomogram can be useful in bony ankylosis or articular deformity. MRI scans are not often required.