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Electromyographic Analysis and Its Role in the Athletic Shoulder

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Abstract

In 1944, Inman made some conclusions regarding shoulder function that have become the foundation of a classic model. Clinical observations of the athletic shoulder and its associated common injuries have demonstrated selective weakness of specific rotator cuff muscles rather than generalized muscle impairment. Shoulder mechanics during athletic activities have been evaluated dynamically with electromyography (EMG), which has helped to formulate a base for optimal rehabilitation. Dynamic EMG and high-speed film analysis have been used to evaluate the shoulder during throwing, swimming, tennis, and golf. Evaluation of shoulder function in these various sports revealed that although rotator cuff function is important in all, the emphasis and role of individual muscles varied. The importance of serratus anterior muscle activity to stabilization and protraction of the scapula has been consistently reported. The muscles about the shoulder act according to their mechanical qualities and are function- or sport-specific. A thorough understanding of the mechanics of the normal and pathologic shoulder constitutes the foundation for training and rehabilitation strategies.