

TENDON INSERTION INTO BONE
-Anatomy and its surgical reconstruction-

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The knowledge of the anatomy and pathology of the tendon insertion into bone of the rotator cuff is to be understood by shoulder surgeons who perform cuff repairs either by open or arthroscopic procedure.

The tendon insertion consists of four identical zones histologically: tendon, unmineralized fibrocartilage, mineralized fibrocartilage and bone. This fundamental structure is similar both in humans and quadrupedal animals, such as dogs, rabbits or mice, although the amount of fibrocartilage varies, most probably, by reflecting its biomechanical demand: the distribution of the traction or compression force within. The attempt to make a model of the reconstruction of this insertion, in the literature and our experience, showed a technical difficulty of keeping the structure because of the excessive traction force applied to the tendon resulting an avulsion of the tendon from the surgically produced trough of the humerus.

In our study of the experimental fascia autografting to the supraspinatus tendon defect, chondrocytes started to appear at 2 weeks after surgery and increased rapidly thereafter at the fascia-bone junction. Although a tidemark was not seen, remodeling of direct insertion with fibrocartilage was almost complete by 8 weeks. In other study by Uthoff et al, with direct suturing of the cut tendon into the bone trough, both the cellularity of the underlying bone and thickness of the subacromial bursa were significantly increased in the operated shoulders after 2 weeks. The cellularity of the stump of the tendon, however, was significantly decreased in the operated shoulders, which suggested the source of cells which contribute to build a new tendon insertion into bone are from the underlying bone and subacromial bursa.

Although the human degenerative tendon might have less potential in reconstructing the new tendon insertion into bone, these data must be considered in determining the procedure of cuff surgery.