



**Figure 1.11** Bursae and ligaments of the shoulder complex.

## NEUROVASCULAR ANATOMY

The rotator cuff is a frequent site of pathologic conditions, usually degenerative and often in response to fatigue stress (Kessler & Hertling 1983). Because degeneration may occur even with normal activity levels, the nutritional status of the glenohumeral structures is of great importance.

### Vascular Supply

The blood supply to portions of the rotator cuff is from the circumflex scapular and suprascapular arteries (Warwick & Williams 1973). These arteries supply principally the infraspinatus and teres minor muscle areas of the cuff. The anterior aspect of the capsular ligamentous cuff is supplied by the anterior humeral circumflex artery and occasionally by the thoracoacromial, suprahumeral, and subscapular arteries. Superiorly, the supraspinatus muscle is supplied by the thoracoacromial artery. The supraspinatus tendon has a region of relative avascularity 1 cm proximal to the humeral insertion, often including its insertion into the humerus (Rathbun & Macnab 1970, Rothman & Parke

1965). Rothman and Parke (1965) have reported hypovascularity in the tendon in 63% of 72 shoulders studied. In a study by Rathbun and Macnab (1970), an avascular area was found in all specimens and was unrelated to age. Abduction of the arm resulted in relaxation of the tension on the supraspinatus muscle and complete filling of vessels throughout the tendon. In addition, with increasing age, the area of avascularity also increases (Brewer 1979); thus, the potential for healing decreases with age. The other cuff tendons generally demonstrate good vascularity, except for an occasional zone of hypovascularity in the superior portion of the insertion of the infraspinatus tendon (Rathbun & Macnab 1970, Rothman & Parke 1965).

### Articular Neurology

Innervation of the shoulder region is derived from C5, C6, and C7; C4 also may add a minor contribution. The nerves supplying the ligaments, capsule, and synovial membrane are axillary, suprascapular, subscapular, and musculocutaneous nerves. Branches from the posterior cord of the brachial plexus also may supply the joint structures. Occasionally, the shoulder may receive a greater