Chapter 3

Functional and Radiographic Anatomy
Functional Anatomy

The distal end of the radius is appropriately considered the anatomic foundation of the wrist joint. The wrist joint is dependent on the bony and ligamentous integrity of this foundation for its mobility and its capacity to support an axial load. Beginning 2 cm proximal to the radiocarpal joint at its metaphyseal flare, the end of the radius is uniquely designed to function as the anatomic bridge uniting the hand to the forearm.23,26,43

The human wrist joint is distinguished from that of lower primates by having a radiocarpal joint. The development of the triangular fibrocartilage complex and loss of a well-defined articulation between the ulna and carpus enhanced the ability of the upper limb to position the hand in space.26,27

The articular surface of the distal radius is biconcave and triangular, with the apex of the triangle directed toward the styloid process; the base represents the sigmoid notch for articulation with the ulnar head (Fig. 3.1). The surface is divided into two hyaline cartilage-covered facets for articulation with the carpal scaphoid and lunate bones. A well-defined ridge traversing from the dorsal to the palmar surface separates the two facets. The facets are concave in both the anteroposterior (AP) and radioulnar directions.

The palmar surface of the distal end of the radius is relatively flat, extending volarly in a gentle curve. A tubercle is present midway, across from which arises the radioscapholunate ligament. In addition, a smooth impression is present on the styloid process, which represents the site of origin of the stout radioscapholunate and radiotriquetral intrascapular ligaments (Fig. 3.2).

The dorsal aspect of the radius is convex. Lister’s tubercle serves as a fulcrum around which passes the extensor pollicis longus tendon. A flattened

Figure 3.1. (left) Articular surface of the distal radius is biconcave and triangular. The surface is divided into two hyaline cartilage-covered facets for articulation with the scaphoid and lunate. The facets are concave in both the anteroposterior (AP) and radioulnar directions.

Figure 3.2. (right) Volar radius and ulna are the sites of origin of the cortical restraining ligaments supporting the carpus. Stout radiocarpal and ulnocarpal ligaments maintain the normal kinematics of the radiocarpal articulation.