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CT of the Wrist: A Tailored Approach[1]

THE role of computed tomography (CT) in imaging of the wrist is continuing to change with widespread availability of CT, decreasing popularity of conventional tomography, and increasing availability of magnetic resonance (MR) imaging. Conventional tomography has lost favor for several reasons, including the time involved in obtaining good-quality images, problems with patient motion and discomfort, and blurring and superimposition of bone detail (1–3). MR imaging has an expanding role in the wrist, particularly in imaging the soft-tissue structures (eg, carpal tunnel contents, extensor tendons, and neoplasia) and the bone marrow of the carpal bones to evaluate for entities such as avascular necrosis, bone marrow edema, occult fractures, and neoplasia (4).

Indications for wrist CT include evaluation of acute trauma, particularly occult or complex fractures (5); assessment of healing of fractures (1) and the postsurgical wrist (6); evaluation of potentially clinically significant lucent defects; and definition of osseous detail to explain an abnormal finding on a bone scan or MR image associated with normal plain radiographs.

Various wrist positions have been described for CT imaging: axial (1,5, 7–9), coronal (8,10), sagittal (1,5,7), and long axis of the scaphoid (2,3,6, 11). Hindman et al and Quinn et al encourage the use of two planes for assessment of carpal and metacarpal fractures (1,5,7). Biondetti et al describe the use of coronal versus axial positions (8). All of the described positions have different specific indications. However, we could find no author who has attempted to emphasize the use of various hand and wrist positions for CT, which are determined on the basis of each specific presenting patient problem.

The purpose of this article is to suggest a tailored approach to wrist CT designed to answer the presenting clinical question. We will describe a new position for assessing the scaphotrapeziotrapezoid (STT) joint, reemphasize the value of obtaining scans perpendicular to the bone surface of interest, and encourage the use of additional scanning planes when the clinical question is not answered by means of images obtained with the patient in the initial scan position. This article is based on our ongoing clinical experience and is not designed to be a retrospective study of our patient population.

GENERAL PRINCIPLES

1. The patient's wrist must be positioned comfortably to ensure there is no patient motion. This can easily be accomplished by using folded bed sheets and pillows. We suggest that the wrist be securely taped to the CT table to prevent wrist movement.
2. Maximal bone detail is obtained by using a high-resolution bone algorithm and a longer scan time. Thin sections (2 mm) with contiguous 2-mm or overlapping 1-mm section intervals are preferred.
3. When acquiring CT data, it is useful to enlarge the area of interest for maximal anatomic detail. We do not require the other wrist for comparison unless we are imaging the distal radioulnar joint or looking for information about anatomic variance that would necessitate imaging of the opposite normal side.
4. One of the scanning planes should be perpendicular to the bone surface, joint margin, or fracture line of clinical interest.
5. Metal hardware artifact is maximally reduced if the scanning plane is parallel to the long axis of the hardware (Fig 1b); however, such placement of the metal part may not always be possible. When it is possible, this will limit the number of images that will have metal artifact.
6. With some ingenuity, scans of the wrist can usually be obtained in the appropriate planes with all forms of cast (Fig 2b).

MATERIALS AND METHODS

A variety of positions have been described and used; each has its own indications. These are the axial, coronal, sagittal, and long axis of scaphoid (oblique sagittal and oblique coronal) positions. A previously undescribed (to our knowledge) position is the oblique position to show the STT joint.

Axial Projection

This was the first position described and is well documented in the literature (1,5,7–9). Depending on patient habitus and physical condition, the hand can be positioned prone, neutral with radial side dependent, or elevated or supine (Fig 3). Both hands can be imaged simultaneously if necessary for comparison (Fig 3d). Indications for axial imaging include (*a*) visualizing the palmar and dorsal bone surfaces, as well as the circumferential cortical detail of each bone; (*b*) demonstrating fractures of the distal radius and hook of the hamate; (*c*) imaging the distal radioulnar joint and its dorsal and palmar radioulnar

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Index terms: Radiology and radiologists, How I Do It • Wrist, abnormalities, 43.40 • Wrist, CT, 43.1211 • Wrist, fractures, 41.43, 43.41

Radiology 1992; 183:13–20

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Abbreviation: STT = scaphotrapeziotrapezoid.

capsular ligaments, the intercarpal joints, the proximal and distal carpal rows, and the pisotriquetral joint; and (*d*) identifying dorsal and/or palmar subluxations of radius, ulna, carpal and metacarpal bones, or fracture fragments of these bones.

Hindman et al (5) advocate this projection as the single most useful plane for detecting occult fractures involving the carpal and metacarpal bones; however, this depends on the plane of the fracture line.

Advantages of the axial plane include ease of positioning, direct comparison with the other hand, and provision of a plane not possible with conventional tomography. Two main disadvantages of this projection are that more sections are needed to cover the entire carpus and that the anatomy is generally less familiar to radiologists than anatomy in the coronal projection.

Coronal Projection

Two different positions have been described (8,10). The most convenient method we have found is that of Pennes et al (10) (Fig 4a, 4b), since there is no need for a wrist holder (Fig 4c) and it allows assessment of the radiocarpal joint with more radiocarpal surface area in apposition than when the wrist is prominently extended or flexed, as is desired with the Vannier fixture.

With the Pennes position, ideally the wrist is slightly flexed or extended at the radiocarpal joint so that neither the forearm nor the metacarpal bones are in the scanning plane; this reduces streak artifact. Care must be taken in positioning to obtain a true coronal axis and to recognize if the wrist is oblique. This will enable ease in interpretation of the scan and decrease the number of CT sections necessary to demonstrate the entire wrist. With the Pennes position, the forearm and hand can be secured by placing bed sheets or sponges on both sides of the hand and forearm or by fixing the wrist to a rigid holder and taping the forearm and hand to the CT table to keep them stable.

Indications for the coronal projection include displaying inter- and intraosseous anatomy of the carpal and metacarpal bones, radius, and ulna; the radiocarpal, intercarpal, and carpometacarpal joint margins and the implied cartilage thickness; and the status of intercarpal and other wrist fusions.

Advantages of this projection are that it correlates well with plain radiographic and bone scan views, making interpretation easier. It provides a good anatomic survey of the wrist to locate an abnormality and necessitates the least number of sections to scan the entire wrist, including the radiocarpal, distal radioulnar, and carpometacarpal joints.

The major disadvantage of this projection is that the dorsal and palmar surfaces of the wrist bones are not well evaluated. A disadvantage of the Pennes position is that the wrist can easily roll to an off-lateral (oblique coronal) position if care is not taken in securing the wrist during positioning. The Vannier method with use of the wrist holder has the disadvantage that the wrist is maintained in considerable extension, thus producing less apposition between the radius and proximal row of the carpus.

Sagittal Projection

The direct sagittal technique is also well documented (1,5,7) and can be performed with the patient prone (Fig 2a) or supine. Ideally, there should be slight radial or ulnar deviation at the radiocarpal joint to reduce any streak artifact from the radius and ulna. Alternatively the wrist could be positioned in neutral position with slightly less than 90° of flexion at the elbow; however, this could produce an image that is more oblique sagittal with respect to the carpal bones and may be more difficult to interpret.

The main indications for the sagittal view are the need to demonstrate the third metacarpal, capitate, lunate, and radius axis; the dorsal and palmar cortices of wrist bones; and the dorsal and/or palmar subluxations between the carpal, radiocarpal, and/or carpometacarpal joints.

This is also an excellent second projection with which to evaluate separation and depression or elevation of distal radius fracture fragments (Fig 5g).

Advantages of the sagittal projection are that it correlates with the lateral plain radiograph and is a valuable complementary axis to either the coronal or axial planes, particularly in fracture assessment.

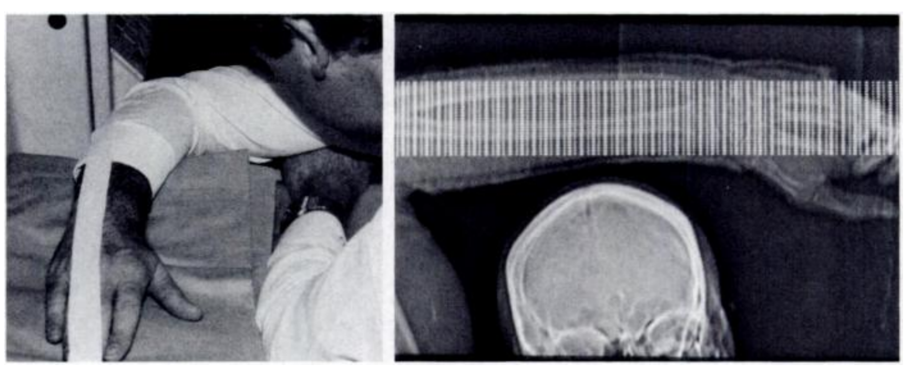
The major disadvantage of this projection is that it is inadequate to evaluate the radial and ulnar borders of osseous wrist structures.

Long Axis of Scaphoid (Oblique Sagittal) Projection

Three positions along the long axis of the scaphoid have been described (2,3,11). We prefer the method described by Sanders (11) and like to have the wrist in ulnar deviation when possible (Fig 1a). This lengthens the scaphoid on the initial topogram and allows easier selection of the long axis of the scaphoid. Care must be

a. b.

Figure 1. Scaphoid long-axis (oblique-sagittal) positioning. **(a)** Slight to full ulnar deviation at the radiocarpal joint will allow easier visualization of long axis of scaphoid (parallel to a line between Lister tubercle [white arrowhead] and base of first metacarpal [black arrowhead]) on topogram and on subsequent CT images. **(b)** Topogram shows axis of oblique sagittal scan plane is nearly parallel to the long axis of the metallic screw (arrowheads), to reduce metal artifact.

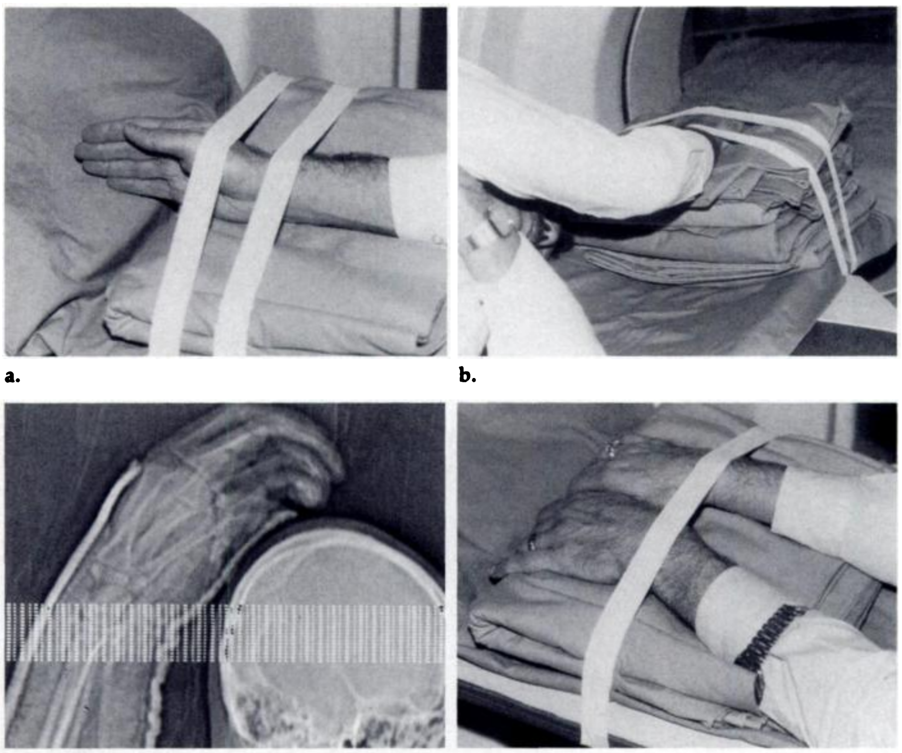


a. b.

Figure 2. Sagittal positioning. **(a)** Slight radial or ulnar deviation at the radiocarpal joint is desirable to reduce streak artifact from the radius and ulna. **(b)** Topogram demonstrates supine positioning for sagittal images.

taken to familiarize oneself with the anatomy in this projection to avoid mistaking the joint space between the capitate and scaphoid for a fracture of the scaphoid waist. In patients with metal hardware transfixing the scaphoid, artifact can be decreased by choosing a plane parallel to the long axis of the metal hardware (Fig 1b) (Wilson AJ, oral communication, 1990).

The principal indication for this plane is evaluation of scaphoid fractures to show the position of fracture fragments, the status of grafts to aid fracture union, and the status of healing or nonunion. If this CT position is repeated with the wrist in full extension, possible abutment between a dorsal exostosis at the fracture site and the radius can be evaluated. Abutment could also be shown with direct sagittal CT with the wrist in full extension; however, this would not have the advantage of also displaying the long axis of the scaphoid. Similarly, motion between fracture fragments could be identified if such information is desired, as has been described with tomography (12).



a. b. c. d.

Figure 3. Variations in positioning for axial imaging of the wrist. It is important to support and securely tape the hand and forearm in position to prevent wrist movement during study. Minimum tape is used here for ease of illustration. **(a)** Wrist in neutral position with radial side elevated. **(b)** This position can be used for a patient with a long arm right-angle cast. **(c)** Topogram demonstrates unusual positioning necessary to obtain axial images of the left wrist in a patient with multiple injuries that prevented movement from the supine position. **(d)** Prone positioning of the wrists when the other wrist is required for normal anatomy. Wrists can similarly be positioned in neutral or supine positions.

The main advantage of this projection is that it allows assessment of palmar and dorsal displacement and/or angulation of scaphoid fracture fragments, gapping at the fracture site, and development of a "humpback" deformity (dorsal exostosis) at the healed or healing scaphoid fracture site (Fig 6b, 6c).

Some disadvantages of this projection include the difficulty encountered when one is learning to understand this view, the restricted information provided by this view about the scaphoid, the slight difficulty in positioning the wrist to keep the "zoomed" area of interest centered on the scaphoid, and the need to position the wrist so that the Herbert screw and/or Kirschner wires are parallel or nearly parallel to the CT plane so that metal artifact is minimized.

Oblique STT Projection

To our knowledge, this projection has not been previously described. The wrist is positioned above the head with the patient prone as for the sagittal projection. The wrist is then overpronated 45° (Fig 7a) or, alternatively, the wrist could be in 45° of supination.

The oblique STT projection allows visualization of the joints among the scaphoid, trapezium, and trapezoid in the same projection and is excellent for assessing the interrelation of these joints, particularly arthrosis and arthrodesis (Fig 7b–7e).

Other Projections

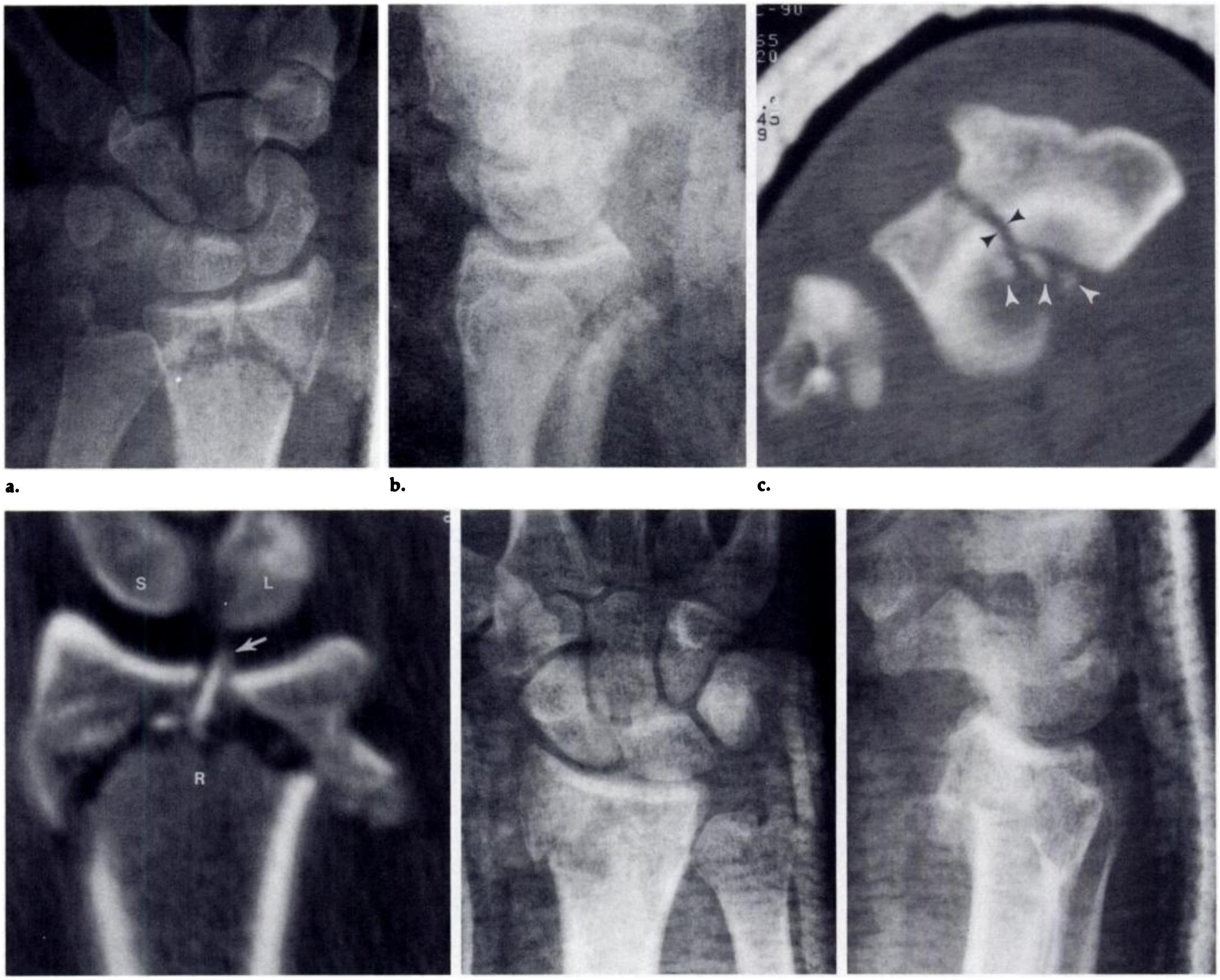
Similarly, other oblique positions or positions in flexion, extension, or radial or ulnar deviation may be devised as needed to answer a clinical question, providing the radiologist understands the purpose of the examination. It is mandatory that the patient's wrist be secured immobile in a comfortable position for the duration of the CT examination.

TAILORED APPROACH

Tailoring a CT study to the clinical question takes no extra CT time once

a. b. c.

Figure 4. Coronal positioning. **(a, b)** Pennes positioning **(a)** before and **(b)** after securing forearm for coronal imaging. The radiocarpal joint is slightly flexed. Bed sheets or other objects placed along both sides of the hand and wrist can help keep the wrist from rolling out of position during the procedure. **(c)** A wrist is supported for coronal scanning by using the Vannier wrist holder. The gantry has not yet been angled.



a. b. c.

d. e. f.

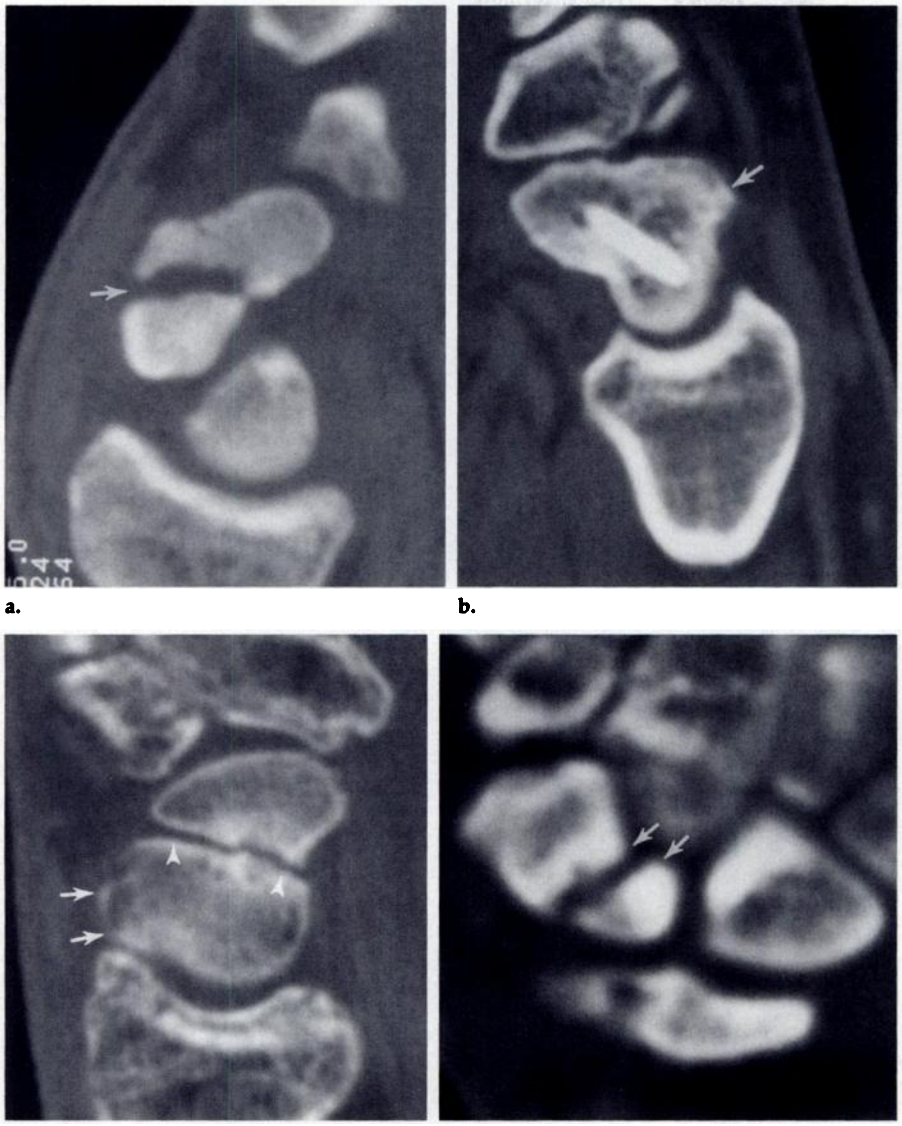
g.

Figure 5. Distal radius fracture. **(a)** Posteroanterior view and **(b)** lateral view of the left wrist in a cast show comminuted distal radius and ulna styloid fractures. The distal articular surface of the radius in the lateral view is in a neutral position. **(c)** Axial image shows lunate fossa diastasis (between black arrowheads) and comminution (white arrowheads). **(d)** Sagittal image shows rotated fragment (arrow) projecting into radiolunate fossa with comminution and impaction of distal radius (*R*). Identification of this fragment changed the management of this case by indicating the need for an operation to remove the fragment from the joint space. *L* = lunate, *S* = scaphoid. **(e)** Posteroanterior and **(f)** lateral views of the right wrist in a cast show a comminuted distal radius fracture, with 10° dorsal inclination of the distal articular surface of the radius. **(g)** Sagittal image shows depression of a central fragment (arrow) in the lunate fossa of the radius not evident on routine radiographs **(e, f)**. The palmar rim of the radius (white arrowhead) is displaced palmarly and rotated dorsally. The dorsal rim (black arrowhead) is displaced dorsally.

the radiologist is familiar with the indications and advantages of the different projections. No single technique is applicable to all diagnostic problems in the wrist. Some patients may require imaging in multiple planes, and, more important, improper positioning may render a CT examination of very little value because an abnormality was missed that would have explained a patient's symptoms.

When the radiologist is unfamiliar with the various positions, it is not unusual that positioning of the patient may take longer than the CT examination itself. This is especially true in the disabled, obese, or severely injured patient (Fig 3c). Once the radiologist becomes familiar with the various methods of wrist placement, the patient can be secured on the table in 2–3 minutes for any of the positions described herein. It should be rare that a desired wrist position cannot be obtained.

The following discussion is a suggested approach to solving various diagnostic wrist problems with CT.



a. b. c. d.

Figure 6. Scaphoid fractures. (Radius is at bottom of figures.) **(a)** Long-axis image shows dorsal gapping at fracture site (arrow). **(b)** Long-axis image shows a humpback deformity (arrow) secondary to healed scaphoid fracture. Streaking artifact from the Herbert screw is reduced by imaging parallel to the screw. **(c)** A long-axis image demonstrates nonunion (corticated margination) of a scaphoid waist fracture (arrowheads). An exostosis (arrows) on the dorsal proximal margin of the proximal scaphoid fracture fragment abuts the dorsal rim of the radius. **(d)** Coronal image illustrates radioulnar offset (between arrows), which cannot be assessed in long-axis projection.

Fractures

CT is useful in the detection of occult fractures suspected on the basis of physical examination findings and bone scintigrams when plain radiographs are normal. Simple displaced fractures usually will not necessitate CT unless the decision to operate is dependent on fracture fragment size or displacement. CT is useful in the evaluation of complex comminuted wrist fractures to guide management, especially when one is deciding whether to operate in questionable cases and for preoperative planning in patients who definitely require open reduction and internal fixation. Examination in two planes will frequently be necessary to assess fully the number and size of the fragments; the degree of displacement, depression or elevation, angulation, and rotation of fracture fragments; and the congruity of articular surfaces.

Distal radius.—When examining distal radius fractures, imaging in axial and sagittal planes with 2-mm contiguous sections is usually sufficient. With severe comminution, 2-mm-thick sections at a 1-mm interval may be necessary to show all the anatomy clearly. It may be desirable to obtain 2-mm-thick CT sections at 1-mm intervals in one position and at 2-mm intervals in the second position.

The axial projection provides a map of the distal radial articular surface that is useful to describe distal radius fracture patterns. It will show the degree of diastasis of radioscaphoid and radiolunate fossae fragments, palmar and dorsal cortical comminution, and tangent the distal radioulnar joint to assess incongruity of the articular surface (Fig 5c). The sagittal plane demonstrates congruity and angulation of radiocarpal joint surfaces and the degree of dorsal and palmar surface comminution (Fig 5d, 5g) and more clearly shows depression or elevation of distal radial articular surface fragments.

If for some reason a direct sagittal section is too difficult to obtain because of an unusual cast position, inability to position the gantry at a certain angle, or both, coronal CT may provide a second means of evaluating relationships between radial and ulnar fracture fragments—for example, depression of the scaphoid fossa with respect to the lunate fossa or central depression of either of these fossae with respect to radial and ulnar surfaces of the radius.

Scaphoid.—To evaluate scaphoid fractures, CT performed in the oblique sagittal plane (long axis of scaphoid) (Fig 1a) with 2-mm-thick sections at 1-mm intervals with the option of additional coronal 2-mm contiguous sections is suggested. The wrist should be positioned so that the long axis of the scaphoid is parallel to the scan plane. When a metal fixation screw or wire is present in the scaphoid, as mentioned above, the wrist should be positioned so that the wire or screw is parallel to the scan plane (Fig 1b). Palmar or dorsal fragment angulation, gapping at the fracture site (Fig 6a), and humpback deformity can be best assessed in the long-axis view (Fig 6b, 6c). Abutment of dorsal exostoses against the dorsal rim of the radius, as well as the status of fracture healing, can be well evaluated on the oblique sagittal view (Fig 6c). However, the coronal projection is better for assessing radioulnar offset between proximal and distal scaphoid fragments (Fig 6d), as well as the status of the scapholunate, radioscaphoid, and scaphocapitate joints and intercarpal cartilage thickness, any of which may be abnormal and may alter the management in some patients.

Other carpal bones.—Fractures of the hamate hook are best shown with the axial projection (13). Fractures of the other carpal bones may be surveyed most easily with the coronal view;

depending on the plane of the fracture, however, a second plane may be necessary. In general, axial and sagittal projections are useful second views for assessment of complex comminuted carpal fractures (7). We believe that the very hot bone scintigram is the most valuable test indicating a need for further evaluation with CT or sometimes MR imaging (4). In the presence of a very hot bone scan, CT in a second or even third plane may be necessary to show the fracture. Occassionally, only MR imaging may show a fracture line or evidence of bone contusion.

CT is also useful in assessing complications of fractures in some patients (1), for example, osteoarthritis, chondrolysis, intraosseous lucent defects, and hypertrophy of Lister tubercle. The projection used to assess each of these or other complications will be determined on the basis of the site of the pathologic condition present, as suggested by results of the physical examination, plain radiographs, and/or bone scintigrams.

Arthrodesis and Postsurgical Changes

CT has advantages over plain radiography and conventional tomography in assessing fusion because CT avoids overlapping bone surfaces seen on plain radiographs and blur seen on linear and complex motion tomograms (2,3). The degree of bone bridging or graft incorporation can be better assessed with CT (6) (Fig 7d, 7e). It is important to scan perpendicular to the arthrodesis or graft-bone interface to evaluate the status of graft incorporation or fusion. The exact position of fixation screws and wires relative to joints and soft-tissue structures can be obtained. Metal artifact is reduced if the scan plane is chosen carefully (Fig 6b). Even when many wires or other metal fixation devices create metal artifact, CT information is usually sufficient to answer the clinical question.

Evaluating Potentially Clinically Significant Lucent Defects Seen at Plain Radiography

Focal radiolucent intraosseous defects that communicate with the joint are thought to be more likely symptomatic than purely intraosseous lesions (Fig 8). This is especially true when the defect has focal tenderness and has focal increased uptake on the bone scintigram (L.A.G., unpublished data, 1991; Crandall RE et al, unpub-

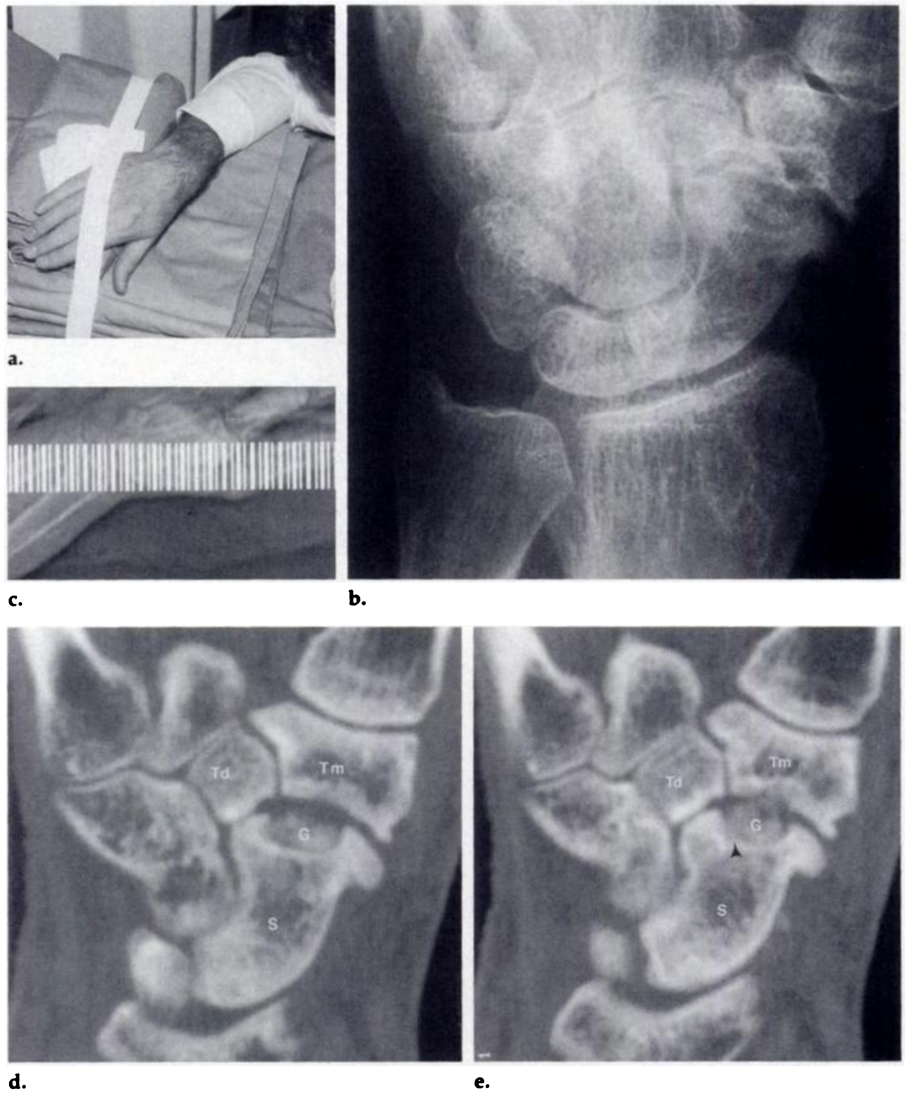


Figure 7. STT joint. **(a)** Oblique positioning of the wrist for visualizing the joints between the scaphoid, trapezium, and trapezoid. **(b)** Oblique posteroanterior view of the left wrist following STT fusion procedure. **(c)** Topogram shows oblique positioning. **(d, e)** Two representative images (progressing from palmar to dorsoradial) of the STT joint show a surgical defect with only questionable areas of bone graft (*G*) incorporation (arrowhead, **e**) involving the distal scaphoid (*S*) and no definite bridging between graft and the trapezium (*Tm*). *Td* = trapezoid.

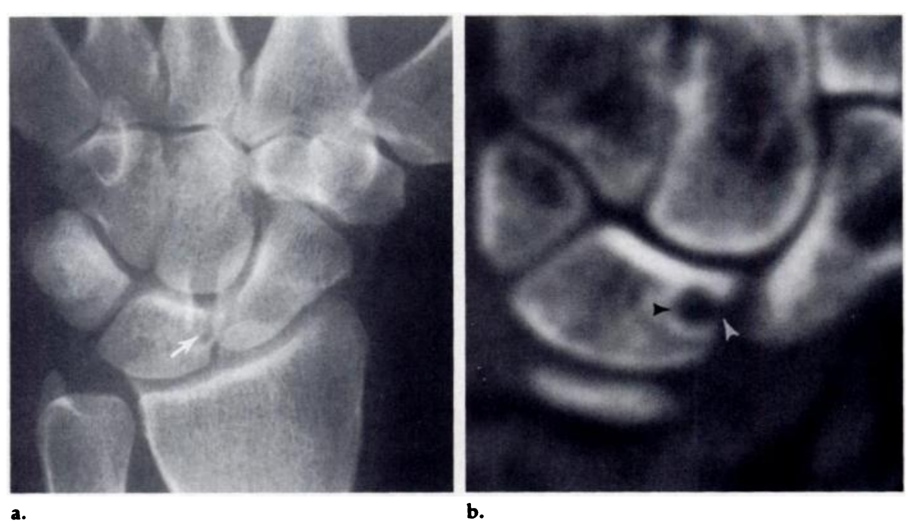
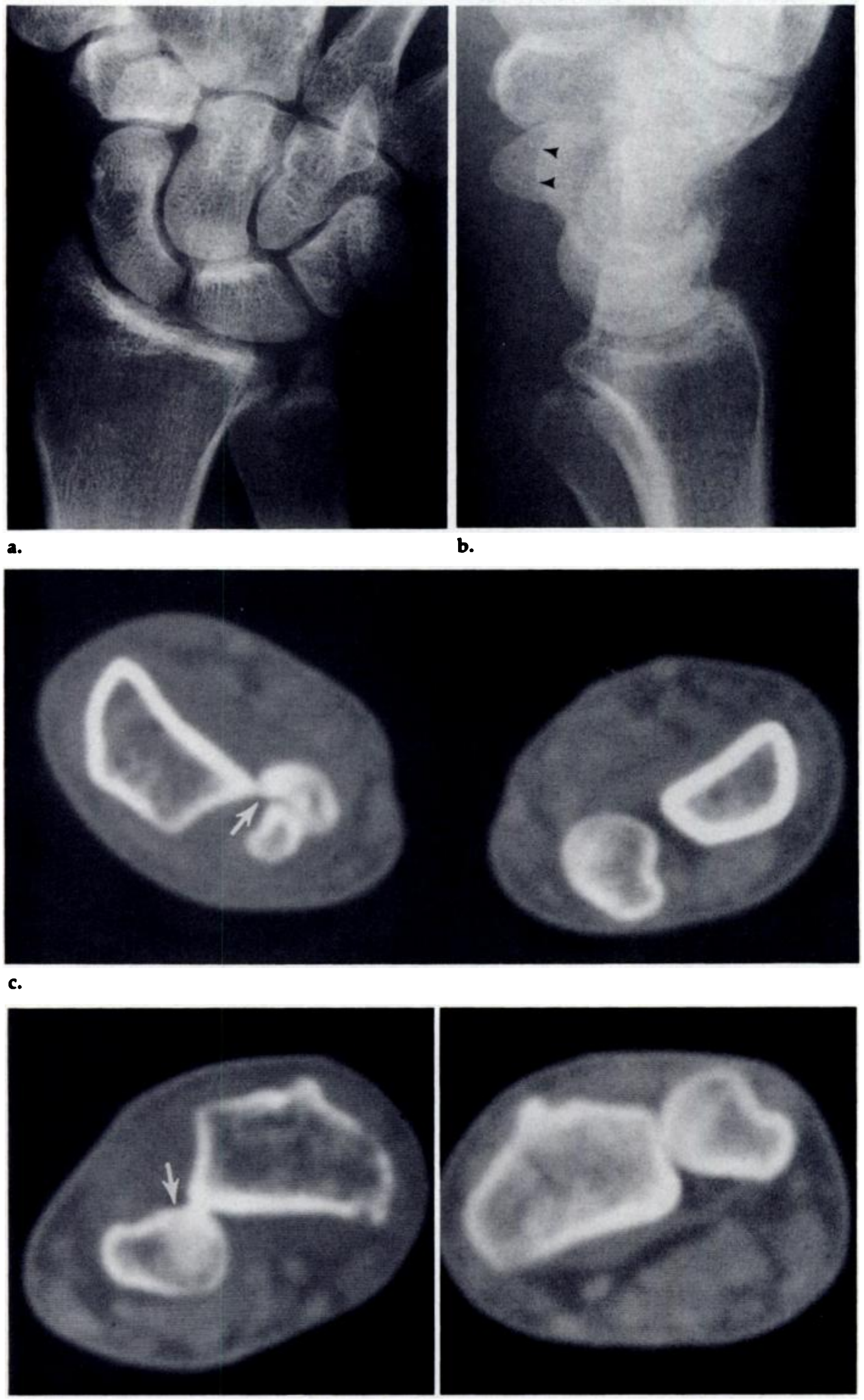


Figure 8. Radiolucent defect in lunate. **(a)** Posteroanterior view of left wrist shows radiolucent area in scaphoid side of lunate (arrow). **(b)** Coronal image demonstrates a radiolucent defect in the lunate (black arrowhead), which communicates with the scapholunate joint (white arrowhead).



a. b. c. d.

Figure 9. Distal radioulnar joint dislocation. **(a)** Posteroanterior view of the right wrist shows ulna minus variant and narrowing of the distal radioulnar joint. **(b)** Lateral view shows the ulna subluxed slightly palmar. When wrist is in true lateral position, palmar cortex of pisiform (arrowheads) overlies the junction of palmar one-third of the distal scaphoid. **(c)** Axial image with wrists in supination shows palmar subluxation of right ulna (arrow). **(d)** Axial image with wrists in pronation shows palmar dislocation of right ulna (arrow).

lished data, 1991). CT is useful for identifying whether a lucent defect communicates with an articular surface or if it is entirely intraosseous. This can be assessed by obtaining scans perpendicular to the joint surfaces adjacent to the defect. Two-millimeter-thick sections at 1-mm intervals are preferred for maximal resolution. The coronal plane is our preferred plane and is often sufficient to characterize the anatomic appearance of the defect. If the defect is large enough, some estimation of whether it contains fat, fluid, or fibrous tissue may be obtained by determining region-of-interest attenuation. Arthrography (Luke D, L.A.G., unpublished data, 1991) or MR imaging can also be useful to characterize the nature of the defect.

Evaluating the Focally Hot Bone Scan or Abnormal MR Image When Plain Radiographs Are Normal

The site of bone scan abnormality might suggest the optimal scan plane; for example, for the scaphoid area, CT should be performed in the long-axis scaphoid plane, and for the hamate hook area, CT should be performed in an axial plane. The coronal plane is useful to survey the entire wrist for correlation with the bone scan. If no abnormality is seen in the initial CT scan plane, imaging in a second plane—usually coronal, frequently sagittal or axial—may be helpful. In patients with abnormal MR images who may require CT for further evaluation, the CT scan planes should be chosen to complement the MR planes. It is becoming increasingly evident that an abnormal MR image of a carpal bone should be correlated with the anatomic structure of the osseous component of the carpal bone with plain radiography, CT, or both. For example, an abnormal MR imaging pattern of a lunate does not necessarily indicate avascular necrosis, but it may be associated with a differential diagnosis such as intraosseous ganglion, cyst, fibrosis, or ulnar impaction syndrome (L.A.G., unpublished data, 1992).

Arthropathy

In a limited role, CT can enable more accurate assessment of cartilage thickness and cortical and intraosseous erosions than plain radiography, since CT can easily show the entire circumference of a bone and with plain radiography numerous tangential views would be required to approach the information obtained with CT for cortical detail. MR imaging has an expanding role in assessing arthropathy (4). The coronal plane is most useful to assess the radiocarpal, intercarpal, and carpometacarpal joint cartilage and to survey for bone erosions. In the presence of Silastic (Dow Corning, Midland, Mich) or detritic synovitis, it is important to show all sites of intraosseous defects, as some surgeons believe it is important to remove all the foreign material, as well as the Silastic implant, to stop the progressive destructive process (Weeks PM, oral communication, 1989). Some of these intraosseous defects may be present distant from the original prosthesis site.

Distal Radioulnar Subluxation or Dislocation

CT in the axial projection, with hands in two positions, is well suited for evaluation of subluxation or dislocation of the distal radioulnar joint. Dislocation can often be diagnosed on a lateral plain radiograph; however, it may be difficult to obtain a true lateral view because pain or immobility may be a limiting factor (14). An even greater problem is determination of when a dorsally or palmarly prominent ulna is a normal variant, is a result of positioning the wrist slightly off lateral, or is a subluxation (Fig 9b). Axial 2-mm-thick contiguous sections are usually sufficient. The hands are initially positioned prone and the thumbs side by side with the distal radioulnar joints at the same level for symmetry and the hands and forearms taped to the CT table (Fig 3d). Images in a second position should be obtained with the hands placed symmetrically in the position that reproduces the patient's symptoms, that is, pain or limited range of movement. This may require oversupination or overpronation (Fig 9). Familiarity of the radiologist with the normal rotation and translation that occurs between the distal radius and ulna is important (15).

Other Diagnostic Problems

CT can also be used to rule out a foreign body or identify its relationship to adjacent structures, to evaluate and/or depict soft-tissue calcification or ossification about the wrist—such as in the carpal tunnel—and to evaluate soft-tissue structures when MR imaging is not available or cannot be performed for various reasons. The carpal tunnel area is well seen by using the axial projection (16). By appreciating the value of CT in the wrist, other uses for wrist CT will also be encountered. Depending on where the questioned abnormality is located, one or more of the views mentioned herein may be most appropriate.

CONCLUSION

We advocate a tailored approach to wrist CT based on the presenting diagnostic problem. When one is familiar with the value and technique of the various imaging planes, this approach takes little extra time for considerable diagnostic gain and patient benefit. Such an approach may require imaging in more than one position, and the scan planes chosen are dictated by the clinical question. We believe CT is currently the investigation of choice for several specific clinical questions involving the wrist. This discussion is designed to serve as a guide to CT imaging of various wrist problems. Further modifications of wrist CT will undoubtedly continue to evolve as various clinical problems and experiences develop. ■

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