Levels of the anatomical cuts of the upper extremity

RADIUS AND ULNA

right

Isolated fixation of the radius is difficult at this level because of the anterolateral vessels and the medial ulna. It can be done with a half pin inserted from posteromedial to anterolateral. Fixation of the two bones is done with a wire from anterolateral to posteromedial. Isolated ulnar fixation is much simpler and can be done with one transverse wire and a second wire from anteromedial to posterolateral, posterior to the ulnar nerve. Fixation with half pins can be done posteriorly at an angle of 20° to the sagittal plane.

Isolated ulnar fixation can be done with a transverse wire (parallel to the coronal plane) and a half pin from posterior to anterior. Isolated radial fixation can be performed with a wire from anterior to posterior and a half pin from posterolateral to anteromedial, angulated 20° to the sagittal plane.

Isolated radial fixation can be carried out with a wire directed from anterior to posterior. A half pin can be inserted from posterolateral to anteromedial at an angle of 20° to the coronal plane. Fixation of the ulna can be performed with a wire from anteromedial to posterolateral, angulated 20° to the coronal plane, and a half pin from posterior to anterior.

Isolated radial fixation can be carried out with a wire directed from anterolateral to posteromedial, angulated 30° to the sagittal plane. A half pin can be inserted in a posterolateral position, perpendicular to the previous wire. Fixation of the ulna can be performed with a wire from anteromedial to posterolateral, angulated 20° to the coronal plane, and a half pin from posteromedial to anterolateral, angulated 10° to the sagittal plane.

Isolated radial fixation can be carried out with a wire directed from anterolateral to posteromedial, angulated 40° to the sagittal plane. A half pin can be inserted from a posterolateral position, perpendicular to the previous wire. Ulna fixation is performed with a wire from anteromedial to posterolateral angulated 40° to the coronal plane and a half pin from posteromedial to anterolateral, angulated 15° to the sagittal plane.

Ulnar fixation is performed with a wire directed from anteromedial to posterolateral angulated 45° to the sagittal plane and a half pin directed from posteromedial to anterolateral, perpendicular to the previous wire. The radius can be fixed with one wire directed from anterolateral to posteromedial angulated 45° with the coronal plane and a second wire inserted from anterior to posterior, between the flexor carpi radialis and the median nerve, using the open technique. A half pin is inserted from posterolateral to anteromedial, perpendicular to the first wire.
INSERTION WIRES AND HALF-PINS - RIGHT

CUT 1

CUT 4

CUT 2

CUT 5

CUT 3

CUT 6
Levels of the anatomical cuts of the upper extremity

RADIUS AND ULNA left

1. Isolated fixation of the radius is difficult at this level because of the anterolateral vessels and the medial ulna. It can be done with a half pin inserted from posteromedial to anterolateral. Fixation of the two bones is done with a wire from anteromedial to posterolateral, and a second wire from anterolateral to posteromedial, posterior to the ulnar nerve. Fixation with half pins can be done posteriorly at an angle of 20° to the sagittal plane.

2. Isolated ulnar fixation can be done with a transverse wire (parallel to the coronal plane) and a half pin from posterior to anterior. Isolated radial fixation can be performed with a wire from anterior to posterior and a half pin from posterolateral to anteromedial, angulated 20° to the sagittal plane.

3. Isolated radial fixation can be carried out with a wire directed from anterior to posterior. A half pin can be inserted from posterolateral to anteromedial at an angle approximating 20 degrees to the coronal plane. Fixation of the ulna can be performed with a wire from anteromedial to posterolateral, angulated 20° to the coronal plane, and a half pin from posterior to anterior.

4. Isolated radial fixation can be carried out with a wire directed from anterolateral to posteromedial, angulated 30° to the sagittal plane. A half pin can be fixed in a posterolateral position, perpendicular to the previous wire. Fixation of the ulna can be performed with a wire from anteromedial to posterolateral, angulated 20° to the coronal plane, and a half pin from posteroaerial to anteromedial, angulated 10° to the sagittal plane.

5. Isolated radial fixation can be carried out with a wire directed from anterolateral to posteromedial, angulated 40° to the coronal plane. A half pin can be inserted from a posterolateral position, perpendicular to the previous wire. Ulnar fixation is performed with a wire from anteromedial to posterolateral, angulated 40° to the coronal plane and a half pin from posteromedial to anterolateral, angulated 15° to the sagittal plane.

6. Ulnar fixation is performed with a wire directed from anteromedial to posterolateral angulated 45° to the sagittal plane and a half pin directed from posteromedial to anterolateral, perpendicular to the previous wire. The radius can be fixed with one wire directed from anterolateral to posteromedial angulated 45° with the coronal plane and a second wire inserted from anterior to posterior, between the flexor carpi radialis and the median nerve, using the open technique. A half pin is inserted from posterolateral to anteromedial, perpendicular to the first wire.
INSERTION WIRES AND HALF-PINS - LEFT
In this cross section the ulnar N. runs medial to the ulna at the point of confluence of the flexor carpi ulnaris, the flexor digitorum superficialis and the pronator teres. The brachial A. has moved laterally and now runs along side the median N.

Isolated fixation of the radius is difficult at this level because of the anterolateral vessels and the medial ulna. It can be done with a half pin inserted from posteromedial to anterolateral. Fixation of the two bones is done with a wire from anterolateral to posteromedial. Isolated ulnar fixation is much simpler and can be done with one transverse wire and a second wire from anteromedial to posterolateral, posterior to the ulnar nerve. Fixation with half pins can be done posteriorly at an angle of 20° to the sagittal plane.
This cross-sectional cut is performed distal to the flexor crease of the elbow. Here bony landmarks are restricted to the subcutaneous border of the ulna as the remainder of the forearm is covered with muscle. The ulnar neurovascular bundle is positioned directly volar to the ulna between the flexor carpi ulnaris and the flexor profundus. The median N. is volar to the medial portion of the radius, and is covered by the flexor digitorum sublimis and flexor pollicis longus. The radial A. and N. are situated between the flexor carpi radi- alis and the brachioradialis. The lateral cutaneous nerve of the forearm can be found in the subcutaneous plane along the anterolateral portion of the forearm.

The ulnar N. runs volar to the ulna at the point of confluence of the flexor carpi ulnaris, the superficial flexors and the deep flexors. The posterior interosseous N. and superficial radial N. run together with the radial A.V.

Isolated ulnar fixation can be done with a transverse wire (parallel to the coronal plane) and a half pin from posterior to anterior. Isolated radial fixation can be performed with a wire from anterior to posterior and a half pin from posterolateral to anteromedial, angulated 20° to the sagittal plane.
In this cross section each of the three major neurovascular elements have assumed a deep position protected by the overlying muscles. The superficial radial N. and radial A. are volar and lateral beneath the brachioradialis. The median N. is volar and central between the superficial and deep flexors of the fingers. The ulnar A.V. and N. remain covered by the flexor carpi ulnaris. The anterior interosseous artery has maintained its position on the volar surface of the interosseous membrane.

Isolated radial fixation can be carried out with a wire directed from anterior to posterior. A half pin can be inserted from postero-lateral to anteromedial at an angle approximating 20 degrees to the coronal plane. Fixation of the ulna can be performed with a wire from anteromedial to postero-lateral, angulated 20° to the coronal plane, and a half pin from posterior to anterior.
This cross sectional cut is taken at the midpoint between the flexor creases of the elbow and wrist. This level represents the apex of radial bowing. The two bones are maximally separated at this point. The three major neurovascular elements have assumed a deep position protected by overlying muscles. The superficial radial N. and radial A. are volar and lateral underneath the brachioradialis. The median N. is volar and central between the superficial and deep flexors of the fingers. The ulnar A.V. and N. remain under the cover of the flexor carpi ulnaris. The anterior interosseous artery has maintained its position on the volar surface of the interosseous membrane.

Isolated radial fixation can be carried out with a wire directed from anterolateral to posteromedial, angulated 30° to the sagittal plane. A half pin can be fixed in a posterolateral position, perpendicular to the previous wire. Fixation of the ulna can be performed with a wire from anteromedial to posterolateral, angulated 20° to the coronal plane, and a half pin from posteromedial to anterolateral, angulated 10° to the sagittal plane.
In this cross-sectional cut, the superficial radial nerve lies subcutaneously over the abductor pollicis longus. The radial artery lies superficially and can be found slightly lateral to the flexor carpi radialis.

The median nerve is on the medial side of the radial wrist flexor, between it and the flexor digitorum sublimis. The ulnar artery and nerve are volar and medial under the increasing mass of the flexor carpi ulnaris. The terminal branches of the anterior interosseous nerve are deeply located on the ulnar border of the radius.

Isolated radial fixation can be carried out with a wire directed from anterolateral to posteromedial, angulated 40° to the coronal plane. A half pin can be inserted from a posterolateral position, perpendicular to the previous wire. Ulna fixation is performed with a wire from anteromedial to posterolateral angulated 40° to the coronal plane and a half pin from posteromedial to anterolateral, angulated 15° to the sagittal plane.
In this cross sectional cut most of the arteries and tendons can be accurately localized by palpation as they lie superficially. The ulnar A.V. lie volar and medial and are protected by the flexor carpi ulnaris T. The median N. is slightly more radial in position, being situated between the flexor digitorum superficialis and the flexor carpi radialis. As in 30% of the normal population, this diagram shows no palmaris longus T. The radial A. is found between the flexor carpi radialis and the abductor pollicis longus.

Ulnar fixation is performed with a wire directed from anteromedial to posterolateral angulated 45° to the sagittal plane and a half pin directed from posteromedial to anterolateral, perpendicular to the previous wire. The radius can be fixed with one wire directed from anterolateral to posteromedial angulated 45° with the coronal plane and a second wire inserted from anterior to posterior, between the flexor carpi radialis and the median nerve, using the open technique. A half pin is inserted from posterolateral to anteromedial, perpendicular to the first wire.