THE ONLY VOLAR PLATE DESIGNED FOR BOTH DORSAL AND VOLAR FRACTURES

THE ANATOMICAL DVR SURGICAL TECHNIQUE

• Optimized Distal Fixation Through Double-tiered Subchondral Support
• Anatomically Contoured Distal Surface
• Temporary K-Wire Fixation
Double-tiered peg support of entire articular surface

- Distal peg row to support volar aspect of subchondral plate
- Distal K-wire holes for temporary fixation and plate alignment to distal fragment
- Proximal peg row to support dorsal aspect of subchondral plate
- Proximal K-wire holes for temporary fixation to proximal fragment

**DISTAL FIXATION OPTIONS:**
- Smooth pegs offer the strongest support
- Threaded Pegs to lag dorsal fragments
- Cancellous screws for volar fractures
**Introduction**

- The DVR-A plate provides stable internal fixation for the treatment of most fractures and deformities of the distal radius
- Volar placement prevents tendon problems, preserves dorsal tissues and allows the use of ligamentotaxis to aid reduction
- Anatomically distributed subchondral support pegs secure the distal fragments and robust plate design allows early functional use of the hand

**indications**

- The DVR-A Plate is indicated for the volar fixation of distal radius fractures unstable in either dorsal or volar direction and for the fixation of osteotomies

**Surgical Approaches**

- Simple and acute fractures can be treated through the standard FCR approach
- Intraarticular fractures, nascent malunions and established malunions are best managed through the extended form of the FCR approach
Incision

- Make an incision approximately 8cm to 10cm. long and over the course of the FCR tendon
- Zig-zag across the wrist flexion creases

RELEASE THE FCR TENDON SHEATH

- Expose and open the sheath of the FCR tendon
- Dissect distally to the level of the superficial Radial Artery
CROSSING THE DEEP FASCIA

- Retract the tendon to the ulnar side and protect the median nerve
- Incise through the floor of the sheath to gain access to the deeper levels
- Split the sheath of the FCR tendon distally to the level of the tuberosity of the scaphoid

MID-LEVEL DISSECTION

- Develop the plane between the FPL and the radial septum and reach the surface of the radius
- Develop widely the subtendinous space of Parona and expose the Pronator Quadratus
ELEVATING THE PRONATOR QUADRATUS

- Release the PQ muscle with an L-shaped incision and lift it from its bed to expose the volar surface of the radius. The volar cortex is thick and the fracture line is usually simple, facilitating reduction.
- The pronator quadratus is frequently ruptured.
- The origin of the FPL muscle can be partially released for added exposure.

THE RADIAL SEPTUM

- Near the styloid process, the radial septum becomes a complex fascial structure which includes the first extensor compartment, the insertion of the brachioradialis and the distal part of the FCR tendon sheath.
The Extended FCR Approach

- Pronation of the proximal fragment provides intrafocal exposure
- This approach is particularly useful when a thorough debridement of a dorsally displaced fracture or access to displaced articular fragments is necessary

The First Extensor Compartment and Brachioradialis

- Open the first extensor compartment and retract the APL and EPB tendons
- Release the insertion of the brachioradialis which is found on the floor of this compartment
- Preserve the radial artery
RELEASE OF THE PROXIMAL FRAGMENT

- Release the radial and dorsal aspects of the proximal fragment
- Preserve the soft tissue attachments to the medial aspect where the anterior interosseous vessels are located

PRONATION OF THE PROXIMAL FRAGMENT

- Using the fracture plane, obtain intrafocal exposure by pronating the proximal fragment out of the way. A bone clamp facilitates this maneuver
INTRAFOCAL EXPOSURE

• The Extended FCR Approach allows the debridement of fracture callus and the reduction of complex articular fracture patterns

FRACTURE REDUCTION

• After fracture debridement, reduction is obtained using indirect means such as traction, ligamentotaxis and direct pressure over displaced fragments

• For most fractures, a properly applied bolster is sufficient to maintain reduction during plate application
STANDARD FIXATION TECHNIQUE

- Decide the correct position for the plate by judging how it conforms to the volar surface. Secure the plate to the proximal fragment with either a cortical screw in the oblong hole or with a temporary k-wire.

- Reduce the distal fragment to the plate and secure it with either a k-wire or a single peg applied on the ulnar side of the proximal peg row.

- K-wires applied through the holes on the proximal row guide peg placement.

- Confirm with fluoroscopy.
STANDARD FIXATION TECHNIQUE

- Exchange the proximal temporary K-wire for a 3.5 mm. cortical screw
- Bend the distal K-Wire to allow insertion of the drill guide

STANDARD FIXATION TECHNIQUE

- Drill with a 2mm. bit through the threaded drill guide to create the tract for the proximal row peg
PROXIMAL ROW PEGS DEPTH MEASUREMENT

• Measure carefully the length of the proximal row pegs to prevent excessive length as this can cause extensor tendon irritation

STANDARD FIXATION TECHNIQUE

• Apply the first peg on the ulnar side in order to stabilize the Lunate Fossa
• Use a threaded peg to capture dorsal comminuted fragments
• Always fill all the peg holes on the proximal peg row of the head of the implant as these provide the stability necessary to prevent dorsal re-displacement of the fracture.

• Use the distal row when there is extensive comminution or severe osteoporosis. The distal row provides added support to the central and volar aspect of the subchondral plate.

• Before threading the drill guide to the distal row, it is necessary to provide clearance by countersinking with the 2.5 mm. drill.
- Apply the threaded drill guide and drill with the 2.0 mm bit
- Insert only 18 or 20 mm. pegs on the distal row
• A 20-30 deg. lateral elevation view allows visualization of the articular surface, evaluation of volar tilt and confirmation of proper k-wire/peg placement 2-3 mm. below the subchondral plate

• Finally, pronate and supinate the wrist under fluoroscopy to confirm that the length of each individual peg is correct
• A properly applied plate should not cover the volar lip of the radius to avoid coming in contact with flexor tendons

• The Pronator Quadratus should be repaired over the plate, this will add stability to the distal radio-ulnar joint
• Obtain final radiographic views
• If significant force is necessary for reduction, it may be easier to first apply the plate to the distal fragment and then use the plate as a lever to obtain reduction. The most distal k-wire hole on the implant serves as a guide to assure correct alignment of the plate to the distal fragment.

• First drill a k-wire parallel to the articular surface in the lateral plane. Slide the plate over the K-wire down to the surface of the distal fragment. Then secure the plate to the distal fragment with pegs or more k-wires.
DISTAL FRAGMENT FIRST TECHNIQUE

- Reduce the deformity
- Apply pegs, screws and remove temporary k-wires
- Obtain radiographic confirmation
• Start immediate finger ROM and forearm rotation
• Allow early functional use of the hand for light ADLs
• Support the wrist according to bone quality and stability
### PRODUCT ORDERING INFORMATION

**TOLL FREE (800)800.8188 | TEL (305)412.8010 | FAX (305)412.8060 | WWW.HANDINNOVATIONS.COM**

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<thead>
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<th>PART NUMBER</th>
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<tbody>
<tr>
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<td>DVRA, Standard, Right</td>
<td>TP-16</td>
<td>Peg, Threaded, 2.5mm, 16mm Long</td>
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**THE DVR-A IS ALSO AVAILABLE IN ADDITIONAL SIZES AND CONFIGURATIONS FOR SPECIAL CIRCUMSTANCES**

1. DVRA (Standard) Length: 2.3" (5.9cm) Head: 1.0" (2.4cm)
2. DVRAX (Extended) Length: 3.5" (8.9cm) Head: 1.0" (2.4cm)
3. DVRAS (Short) Length: 2.0" (5.1cm) Head: 1.0" (2.4cm)
4. DVRAN (Narrow) Length: 2.2" (5.7cm) Head: 0.9" (2.2cm)
5. DVRAW (Wide) Length: 2.5" (6.3cm) Head: 1.2" (3.1cm)