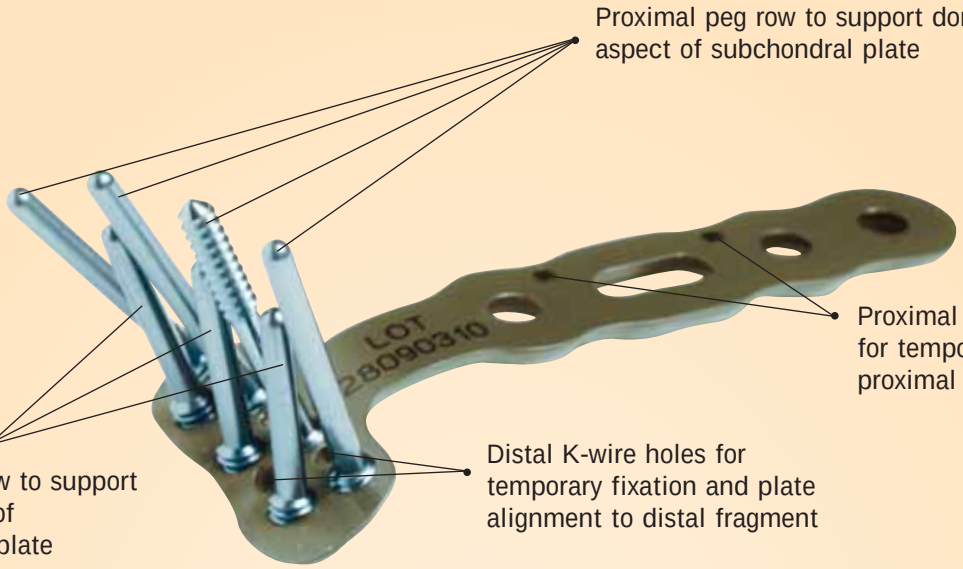
THE ONLY VOLAR PLATE DESIGNED FOR BOTH DORSAL AND VOLAR FRACTURES

THE ANATOMICAL DVR SURGICAL TECHNIQUE

- **Optimized Distal Fixation Through Double-tiered Subchondral Support**
- **Anatomically Contoured Distal Surface**
- **Temporary K-Wire Fixation**

HAND INNOVATIONS

Double-tiered peg support of entire articular surface



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

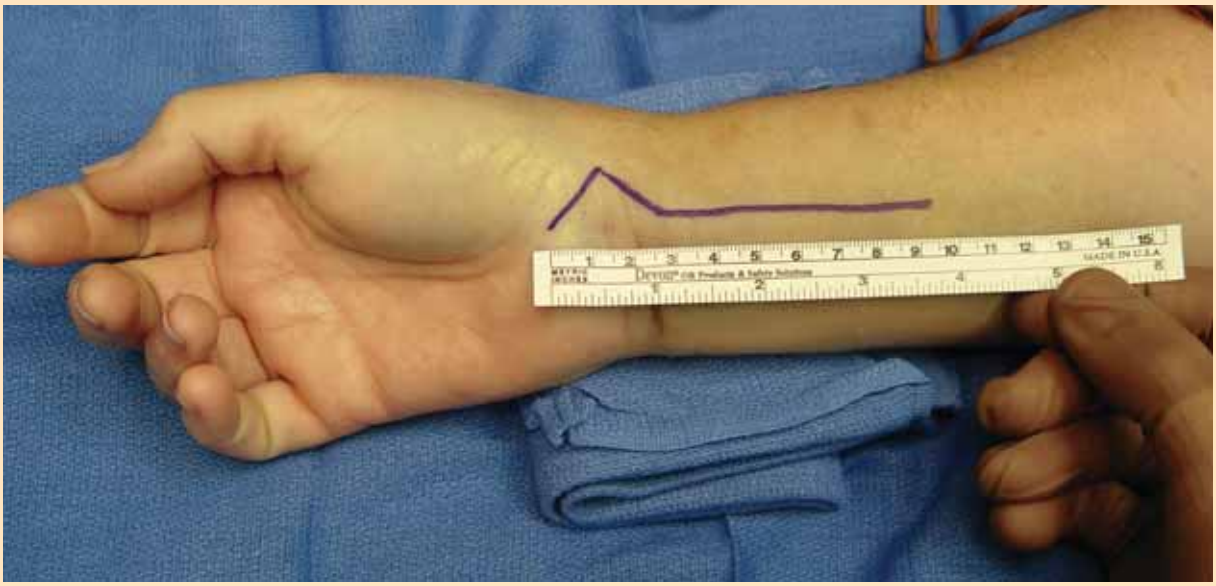
indications

- 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

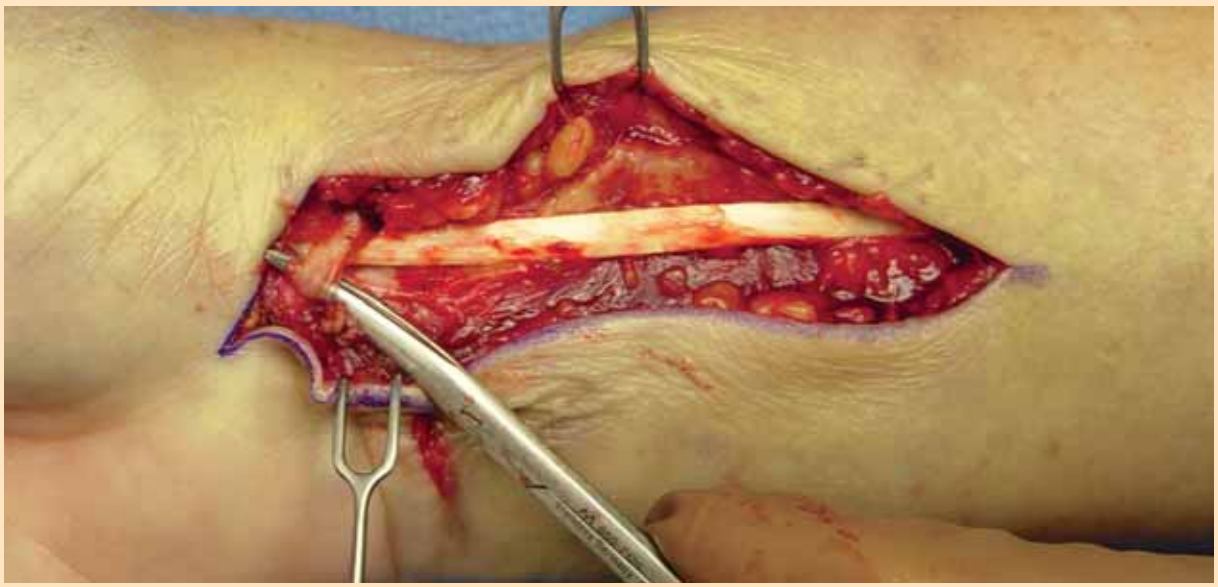
- Simple and acute fractures can be treated through the standard FCR approach
- Intraarticular fractures, nascent malunions and established malunions are best managed through the extended form of the FCR approach

Incision



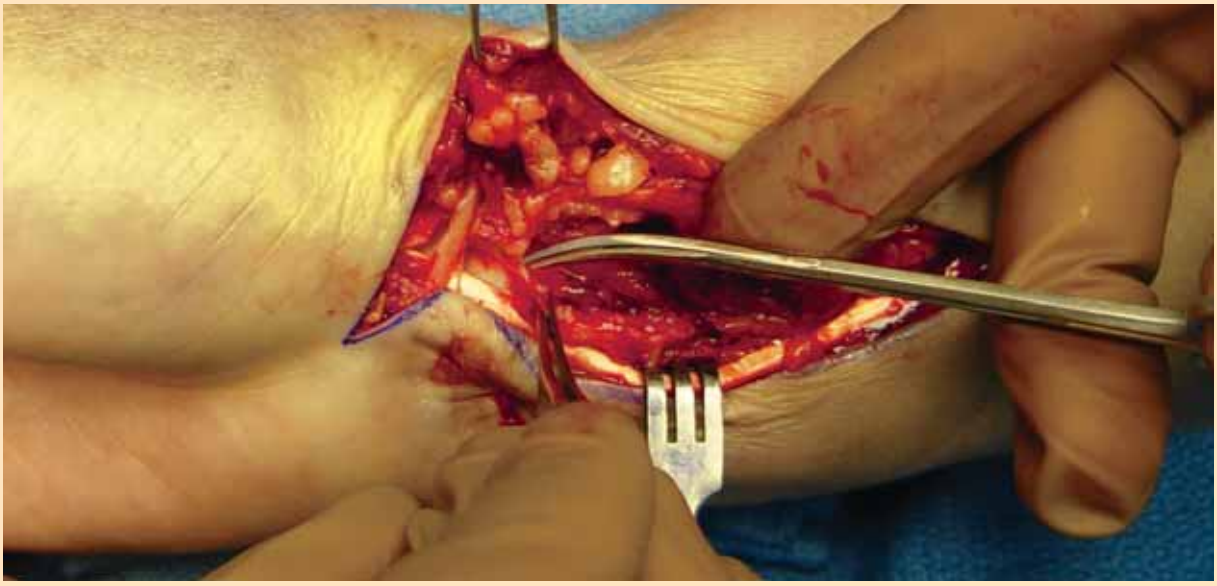
- Make an incision approximately 8cm to 10cm. long and over the course of the FCR tendon
- Zig-zag across the wrist flexion creases

RELEASE THE FCR TENDON SHEATH



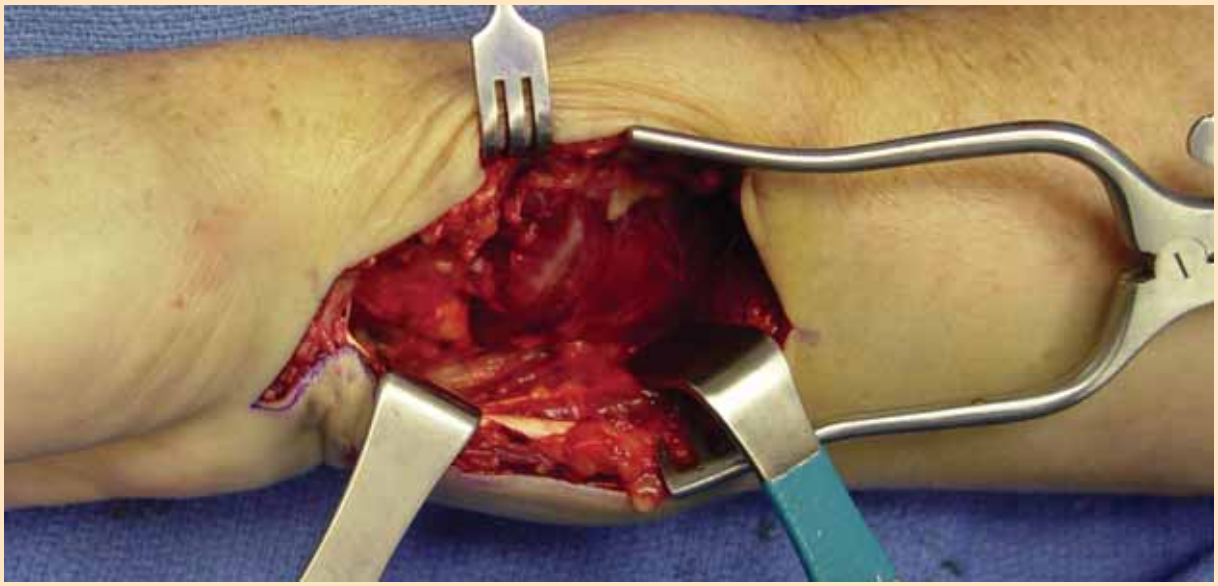
- Expose and open the sheath of the FCR tendon
- Dissect distally to the level of the superficial Radial Artery

CROSSING THE DEEP FASCIA



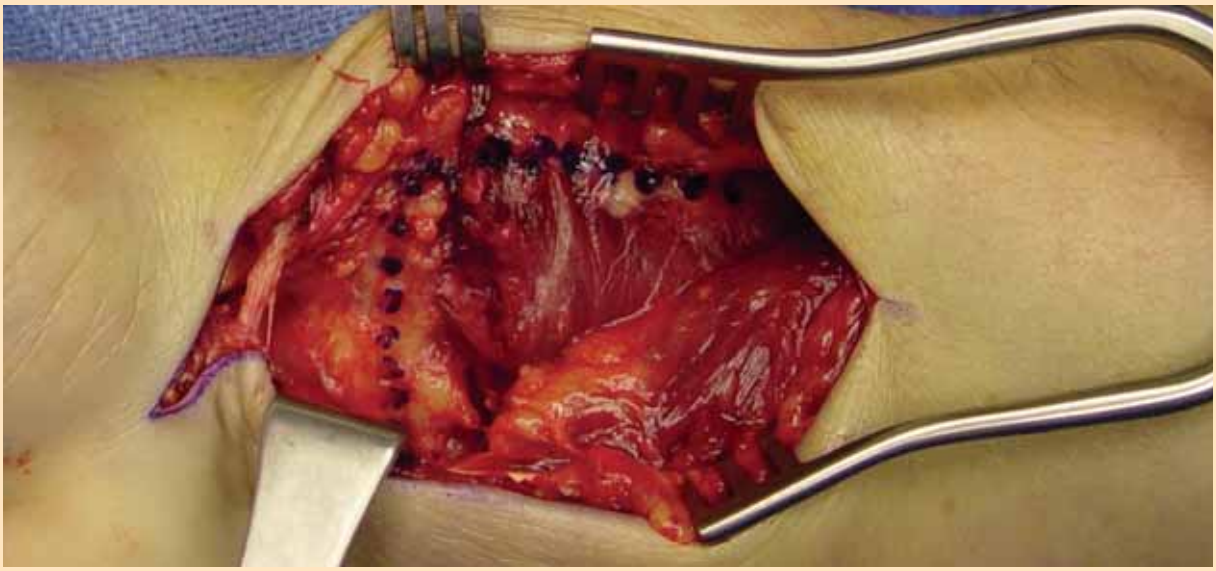
- Retract the tendon to the ulnar side and protect the median nerve
- Incise through the floor of the sheath to gain access to the deeper levels
- Split the sheath of the FCR tendon distally to the level of the tuberosity of the scaphoid

MID-LEVEL DISSECTION



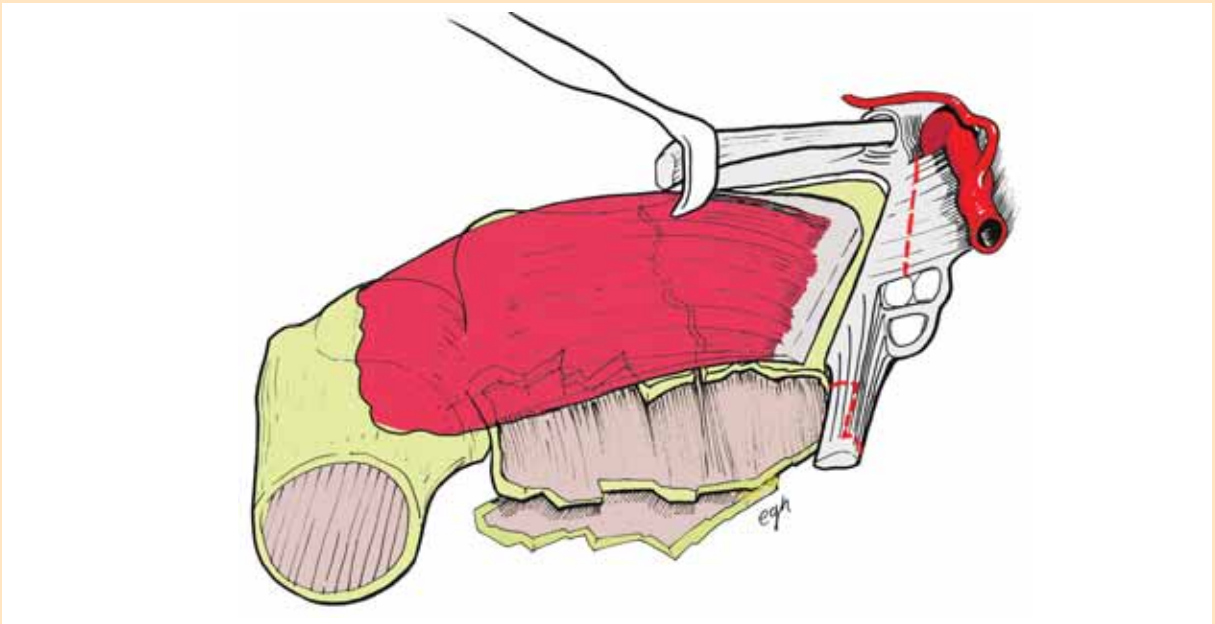
- Develop the plane between the FPL and the radial septum and reach the surface of the radius
- Develop widely the subtendinous space of Parona and expose the Pronator Quadratus

ELEVATING THE PRONATOR QUADRATUS



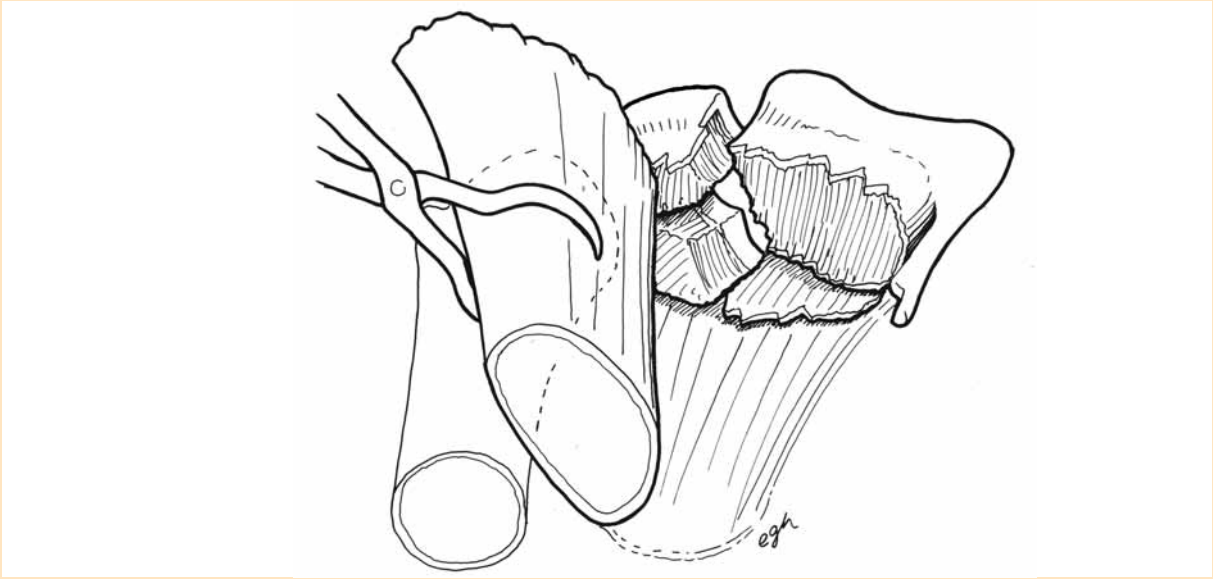
- Release the PQ muscle with an L-shaped incision and lift it from its bed to expose the volar surface of the radius. The volar cortex is thick and the fracture line is usually simple, facilitating reduction
- The pronator quadratus is frequently ruptured
- The origin of the FPL muscle can be partially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

THE RADIAL SEPTUM



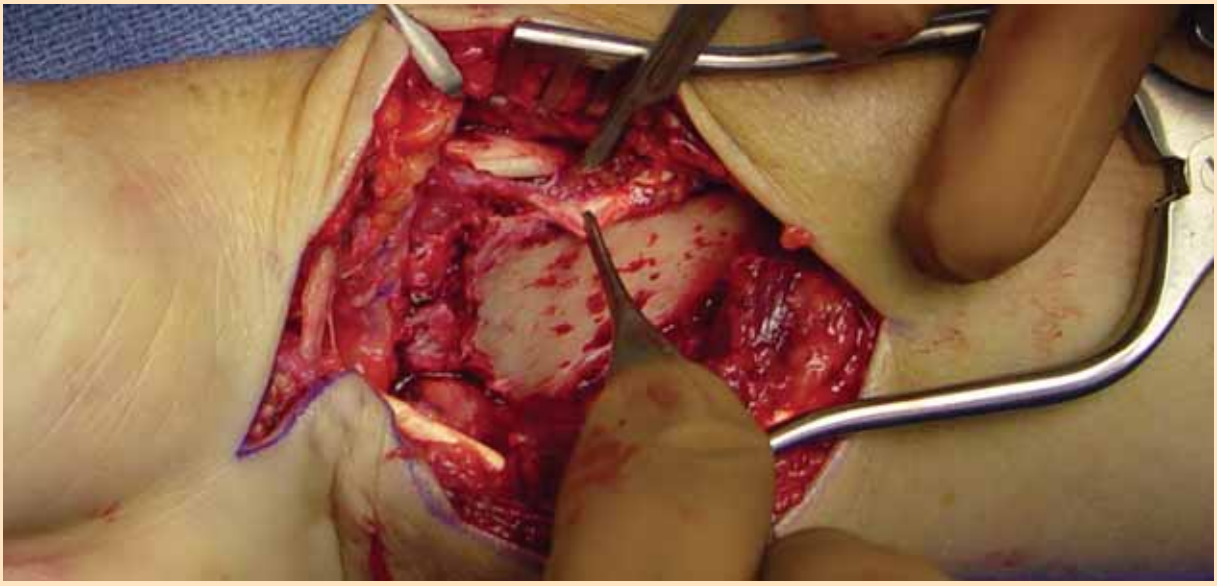
- Near the styloid process, the radial septum becomes a complex fascial structure which includes the first extensor compartment, the insertion of the brachioradialis and the distal part of the FCR tendon sheath

THE EXTENDED FCR APPROACH



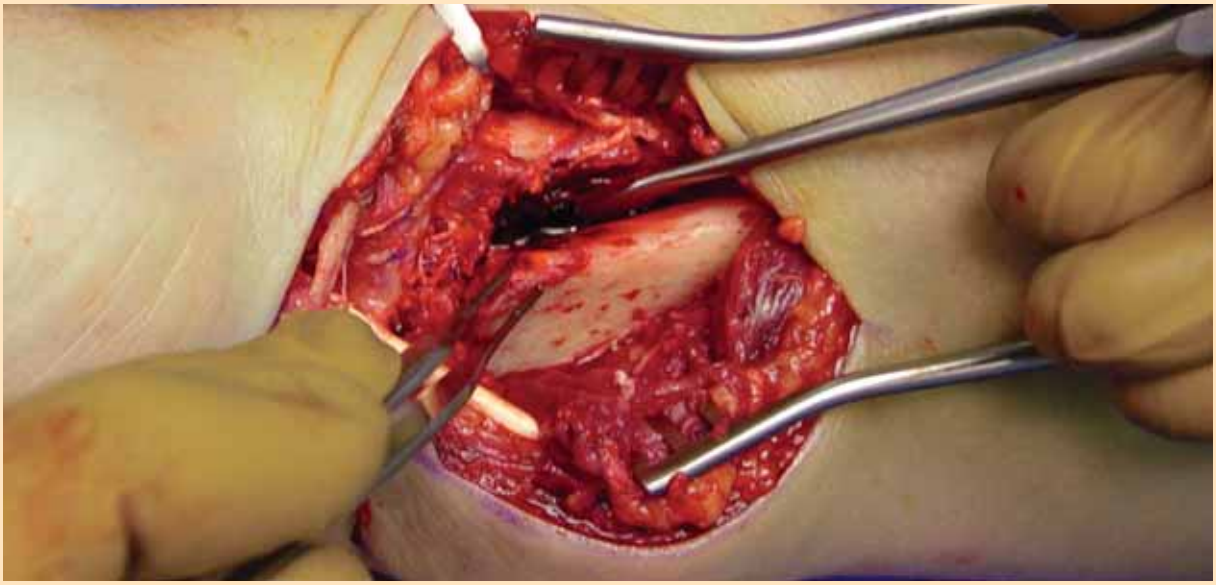
- Pronation of the proximal fragment provides intrafocal exposure
- This approach is particularly useful when a thorough debridement of a dorsally displaced fracture or access to displaced articular fragments is necessary

THE FIRST EXTENSOR COMPARTMENT AND BRACHIORADIALIS



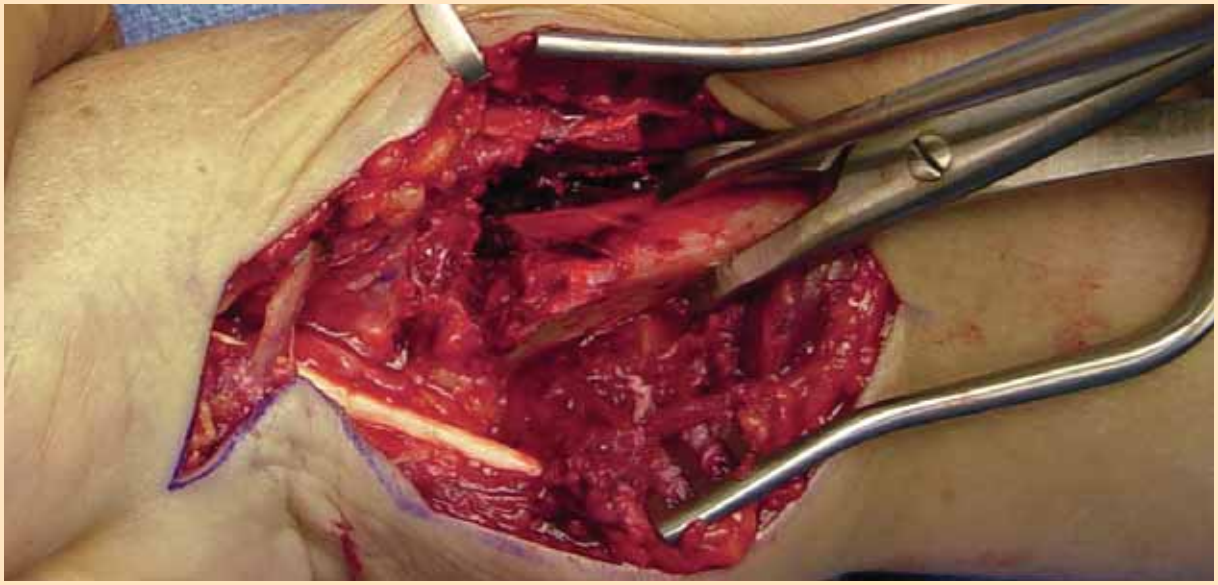
- Open the first extensor compartment and retract the APL and EPB tendons
- Release the insertion of the brachioradialis which is found on the floor of this compartment
- Preserve the radial artery

RELEASE OF THE PROXIMAL FRAGMENT



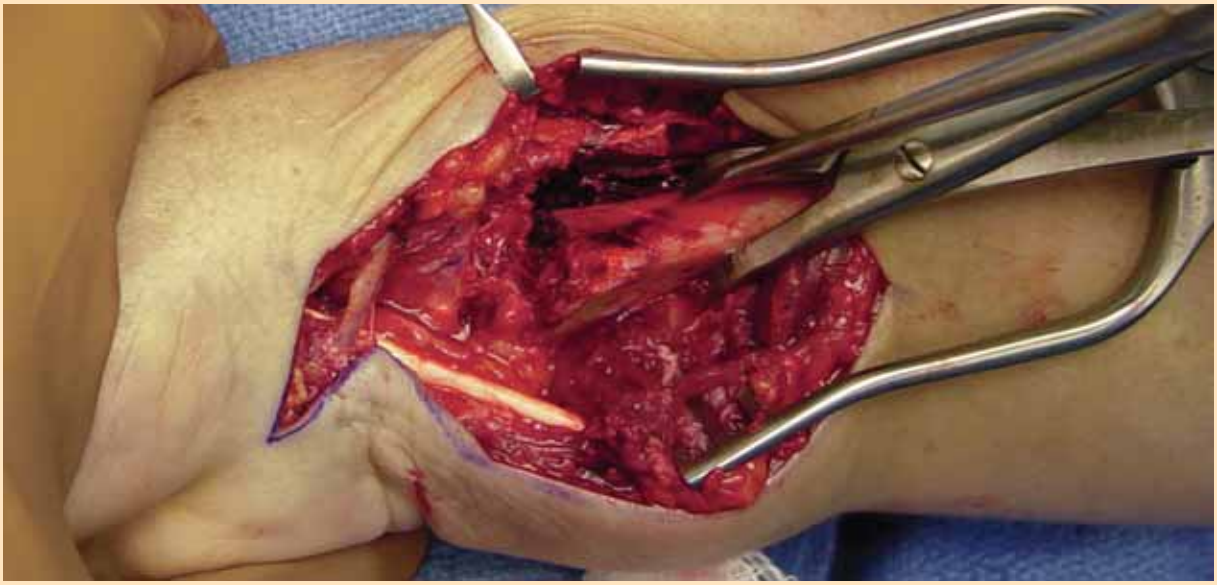
- Release the radial and dorsal aspects of the proximal fragment
- Preserve the soft tissue attachments to the medial aspect where the anterior interosseous vessels are located

PRONATION OF THE PROXIMAL FRAGMENT



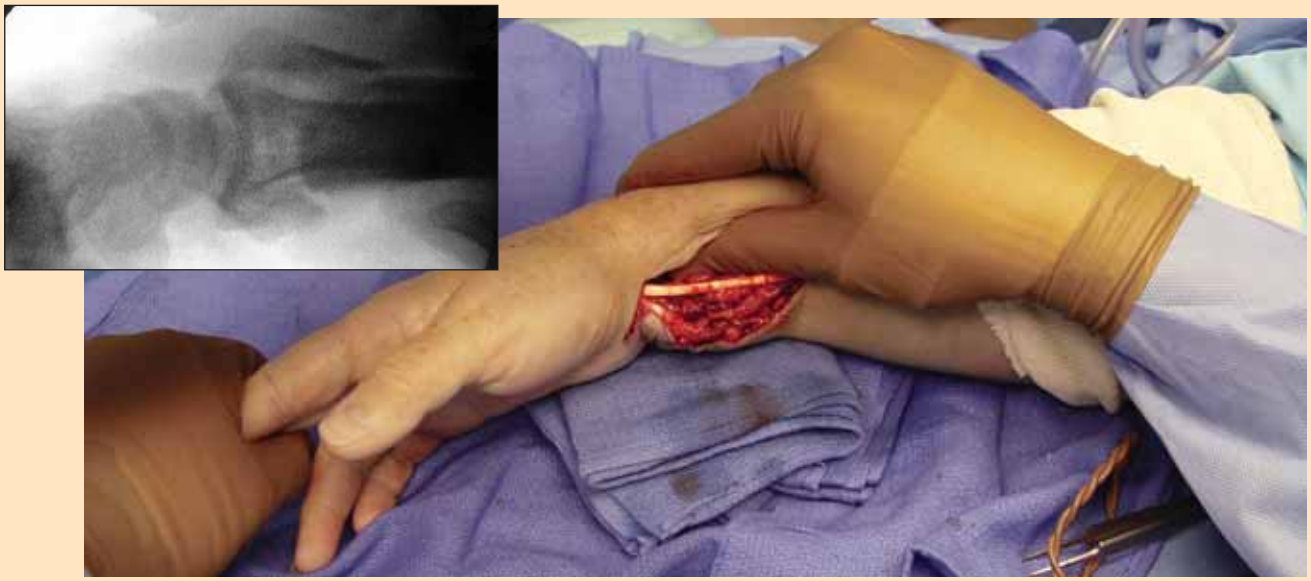
- Using the fracture plane, obtain intrafocal exposure by pronating the proximal fragment out of the way. A bone clamp facilitates this maneuver

INTRAFOCAL EXPOSURE



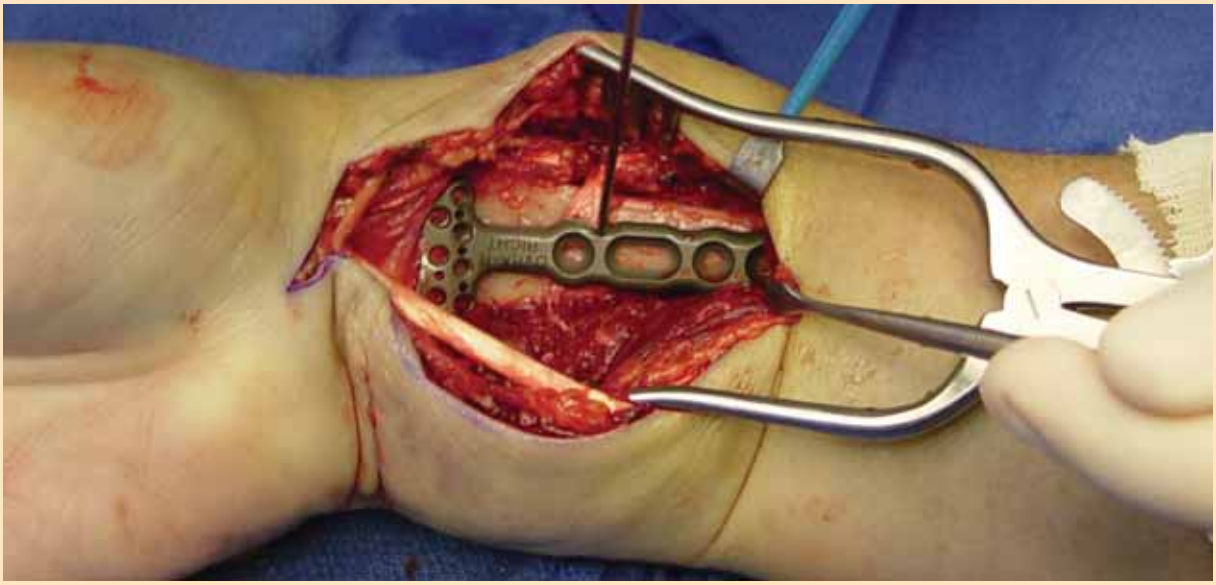
- The Extended FCR Approach allows the debridement of fracture callus and the reduction of complex articular fracture patterns

FRACTURE REDUCTION



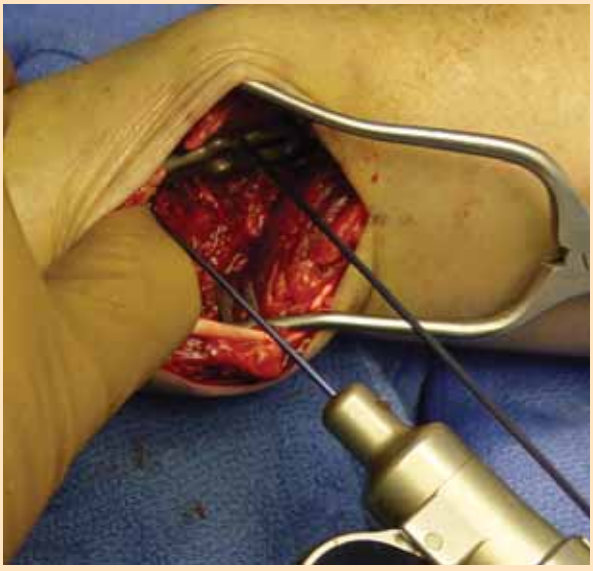
- After fracture debridement, reduction is obtained using indirect means such as traction, ligamentotaxis and direct pressure over displaced fragments
- For most fractures, a properly applied bolster is sufficient to maintain reduction during plate application

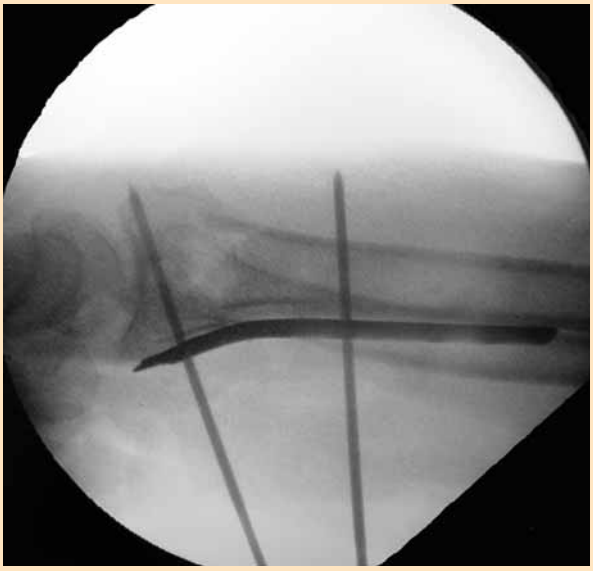
STANDARD FIXATION TECHNIQUE



- 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

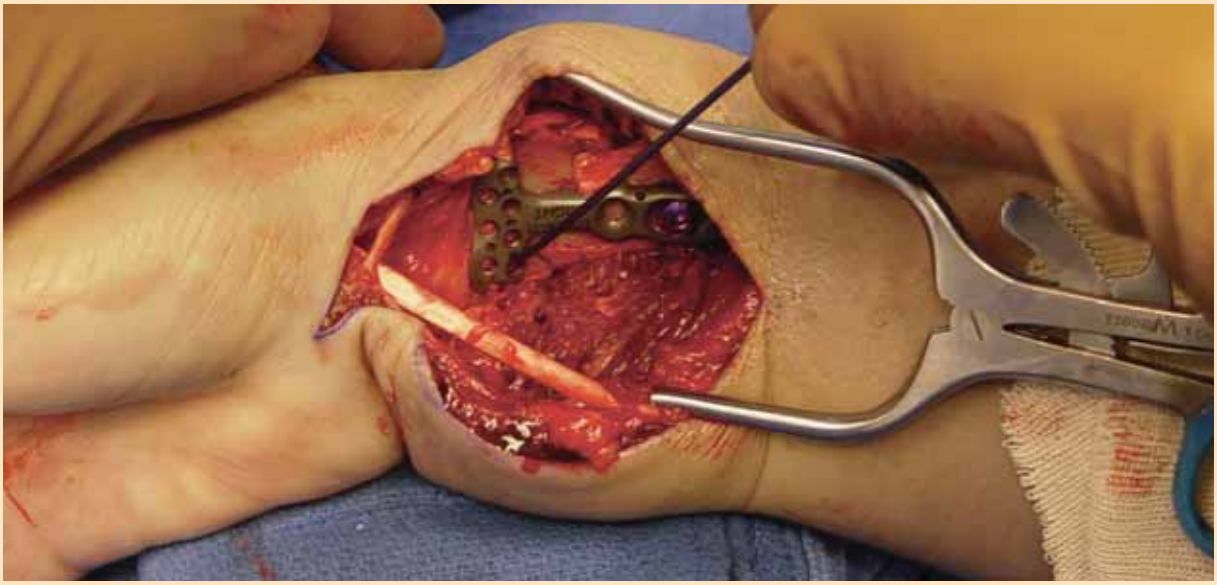
STANDARD FIXATION TECHNIQUE





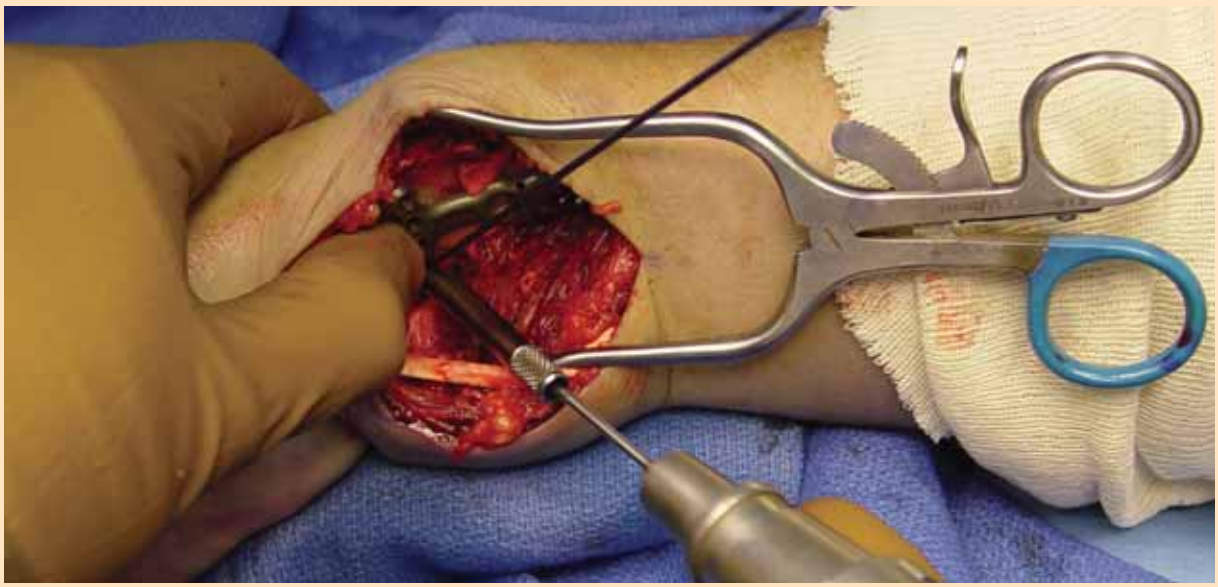
- Reduce the distal fragment to the plate and secure it with either a k-wire or a single peg applied on the ulnar side of the proximal peg row
- K-wires applied through the holes on the proximal row guide peg placement.
- Confirm with fluoroscopy

STANDARD FIXATION TECHNIQUE



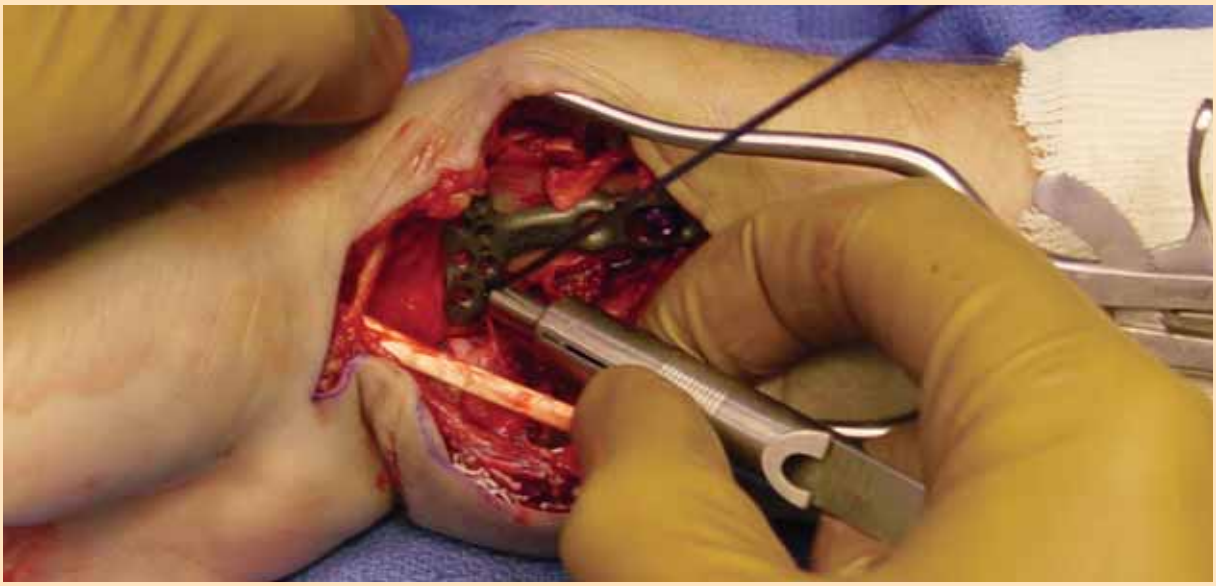
- Exchange the proximal temporary K-wire for a 3.5 mm. cortical screw
- Bend the distal K-Wire to allow insertion of the drill guide

STANDARD FIXATION TECHNIQUE



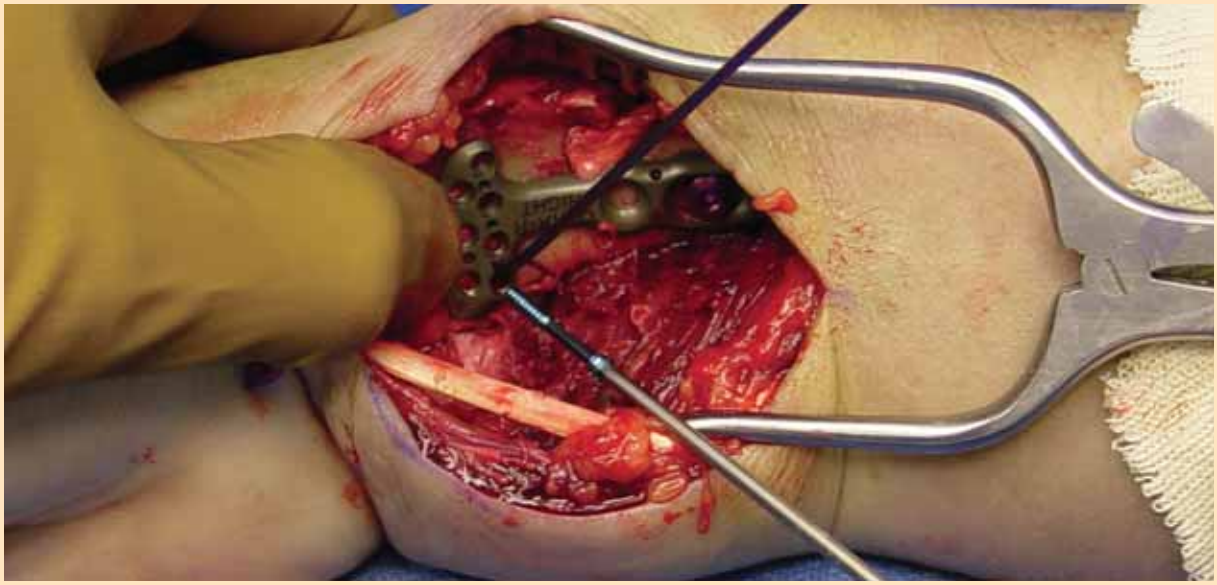
- Drill with a 2mm. bit through the threaded drill guide to create the tract for the proximal row peg

PROXIMAL ROW PEGS DEPTH MEASUREMENT



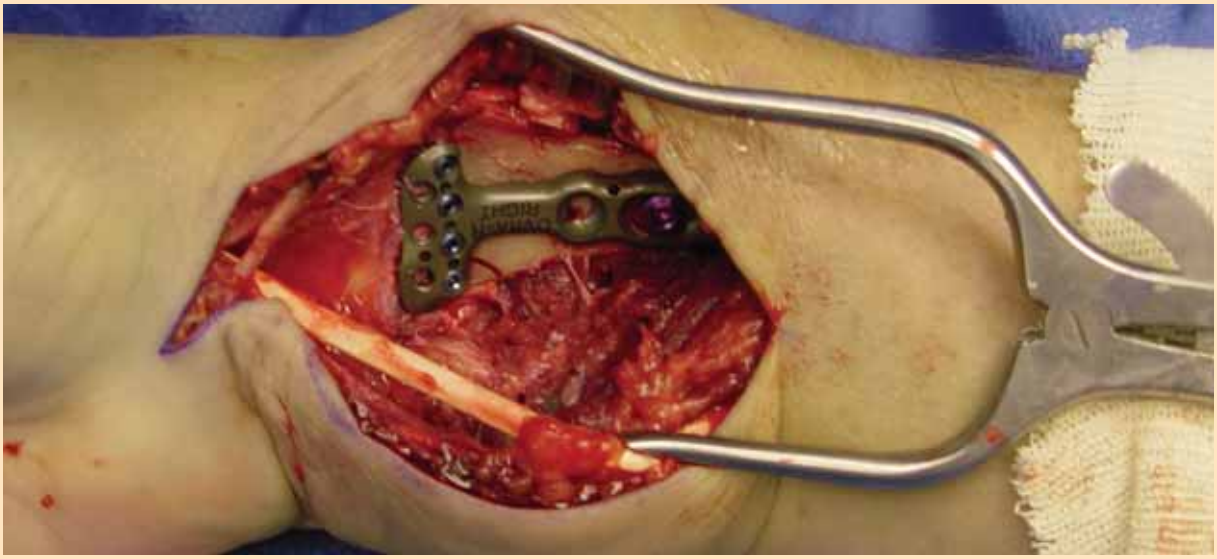
- Measure carefully the length of the proximal row pegs to prevent excessive length as this can cause extensor tendon irritation

STANDARD FIXATION TECHNIQUE



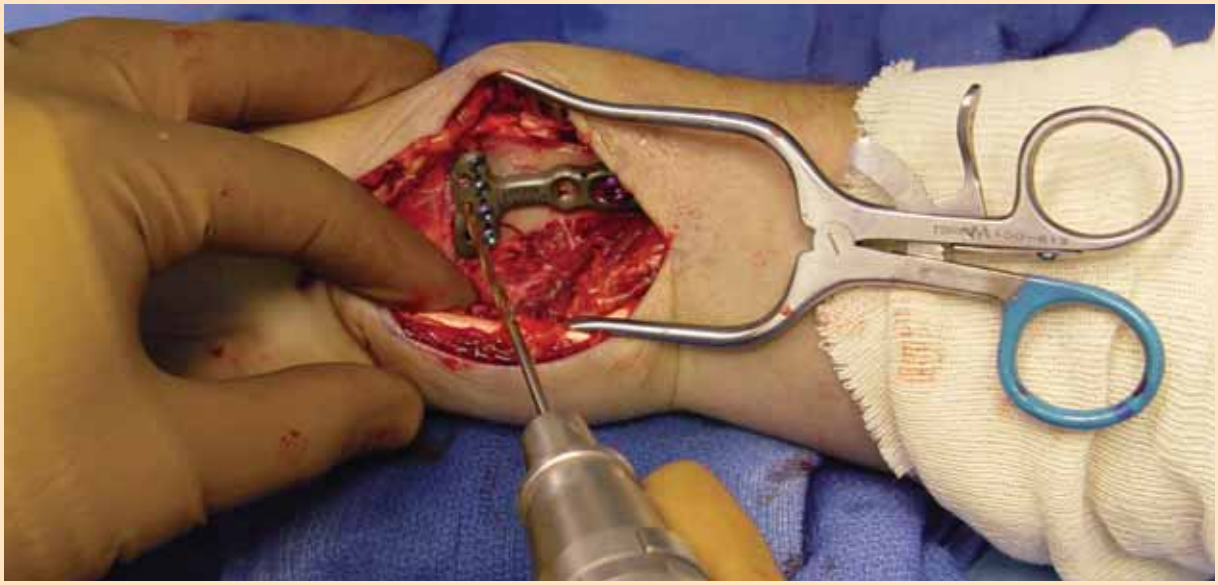
- Apply the first peg on the ulnar side in order to stabilize the Lunate Fossa
- Use a threaded peg to capture dorsal comminuted fragments

STANDARD FIXATION TECHNIQUE



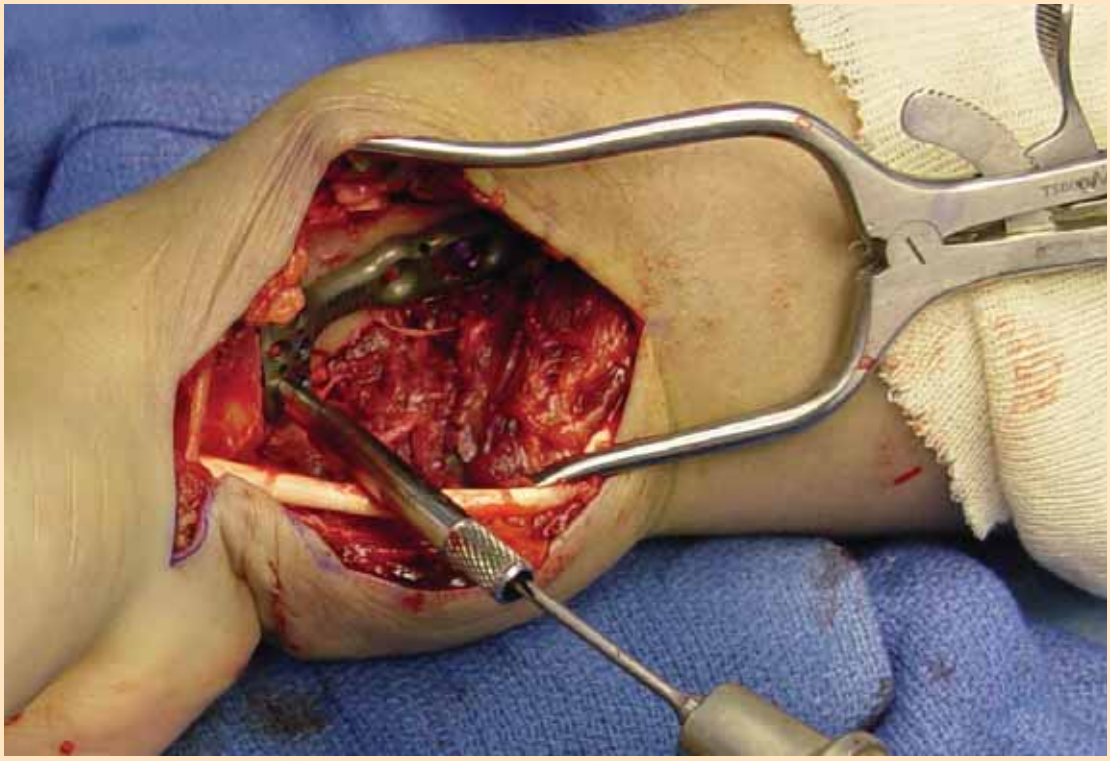
- Always fill all the peg holes on the proximal peg row of the head of the implant as these provide the stability necessary to prevent dorsal re-displacement of the fracture
- Use the distal row when there is extensive comminution or severe osteoporosis. The distal row provides added support to the central and volar aspect of the subchondral plate

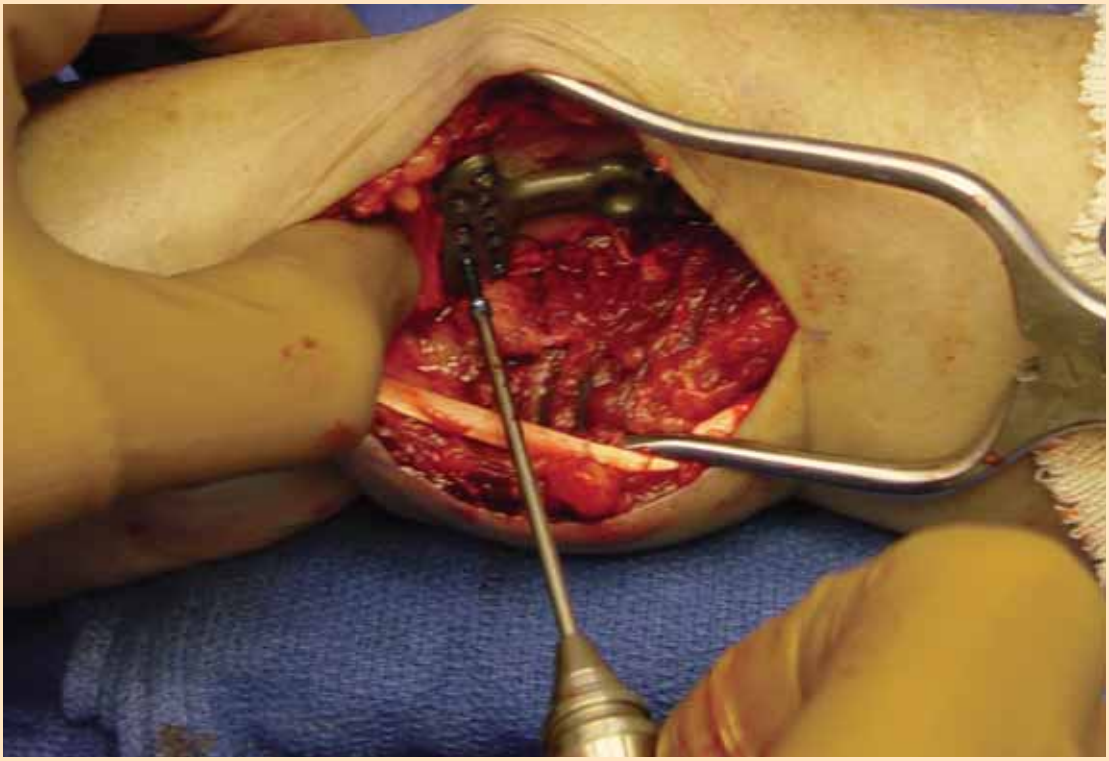
STANDARD FIXATION TECHNIQUE



- Before threading the drill guide to the distal row, it is necessary to provide clearance by countersinking with the 2.5 mm. drill

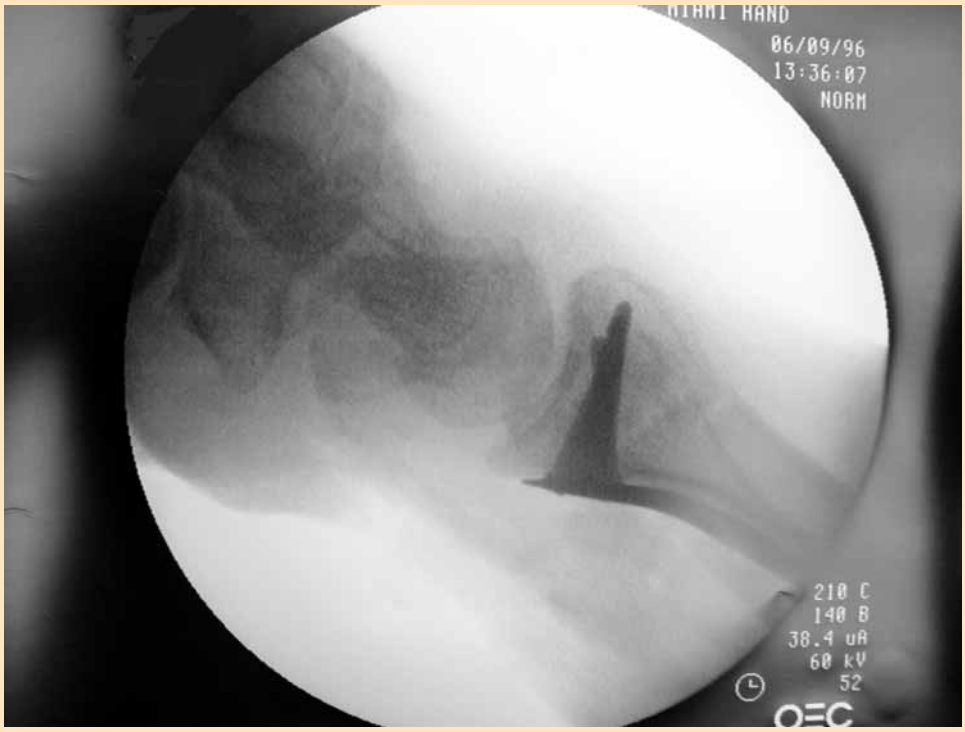
STANDARD FIXATION TECHNIQUE





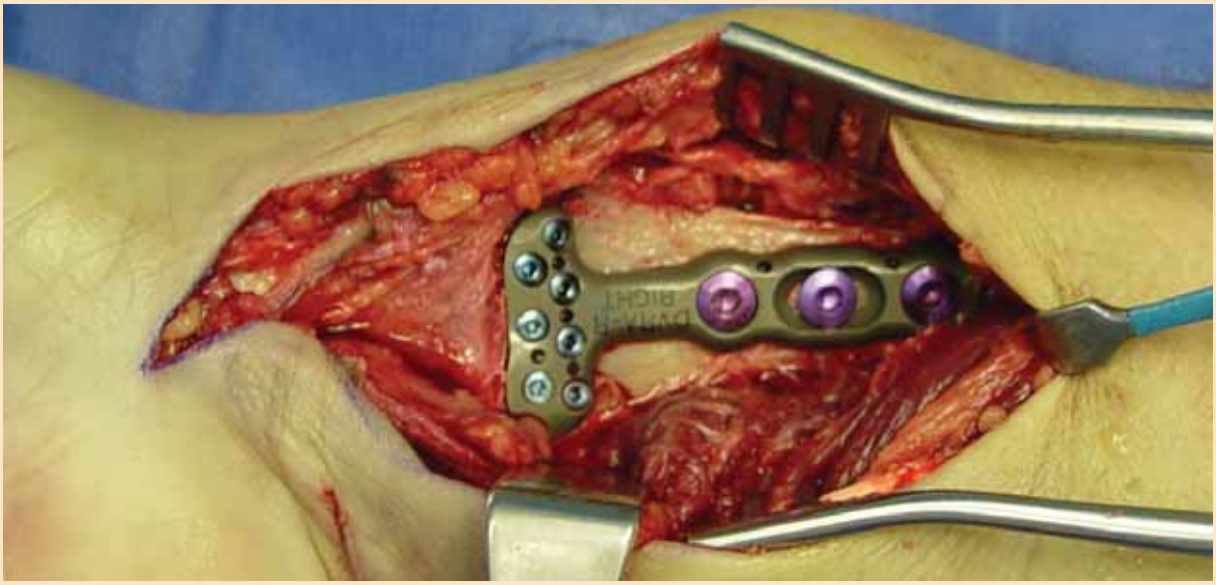
- Apply the threaded drill guide and drill with the 2.0 mm bit
- Insert only 18 or 20 mm. pegs on the distal row

OBTAIN FINAL RADIOGRAPHIC STUDIES



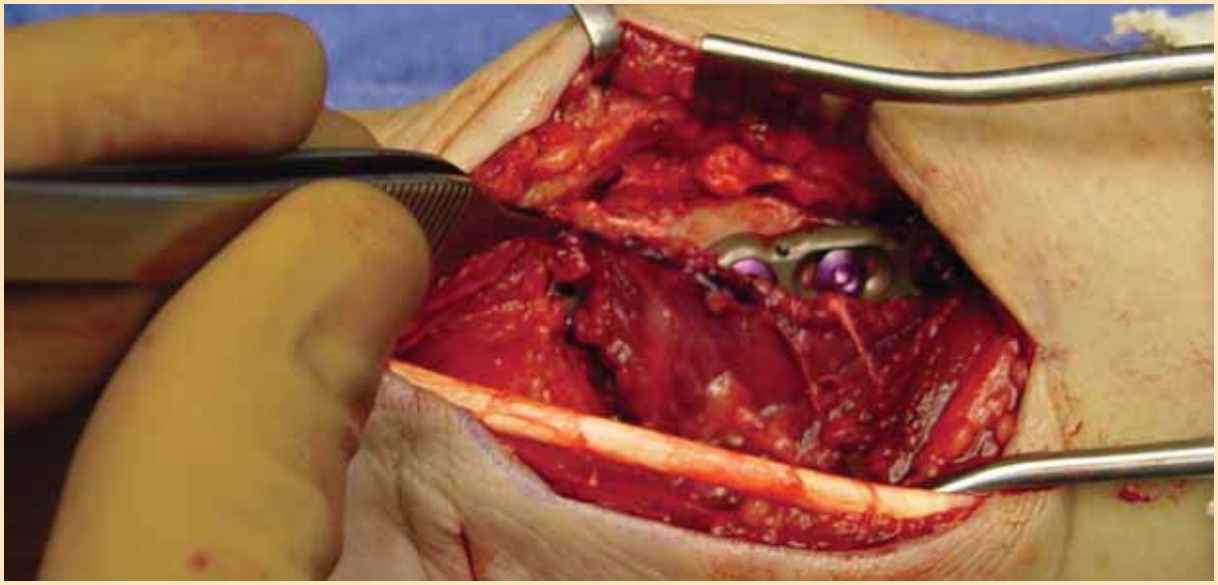
- A 20-30 deg. lateral elevation view allows visualization of the articular surface, evaluation of volar tilt and confirmation of proper k-wire/peg placement 2-3 mm. below the subchondral plate
- Finally, pronate and supinate the wrist under fluoroscopy to confirm that the length of each individual peg is correct

FINAL APPEARANCE



- A properly applied plate should not cover the volar lip of the radius to avoid coming in contact with flexor tendons

REPAIR OF THE PRONATOR QUADRATUS

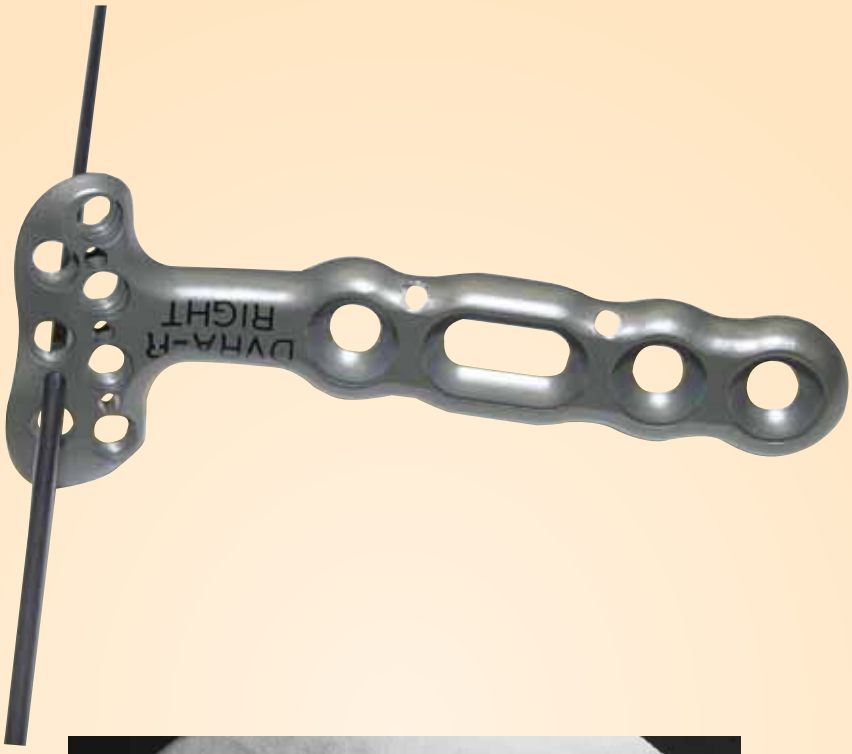


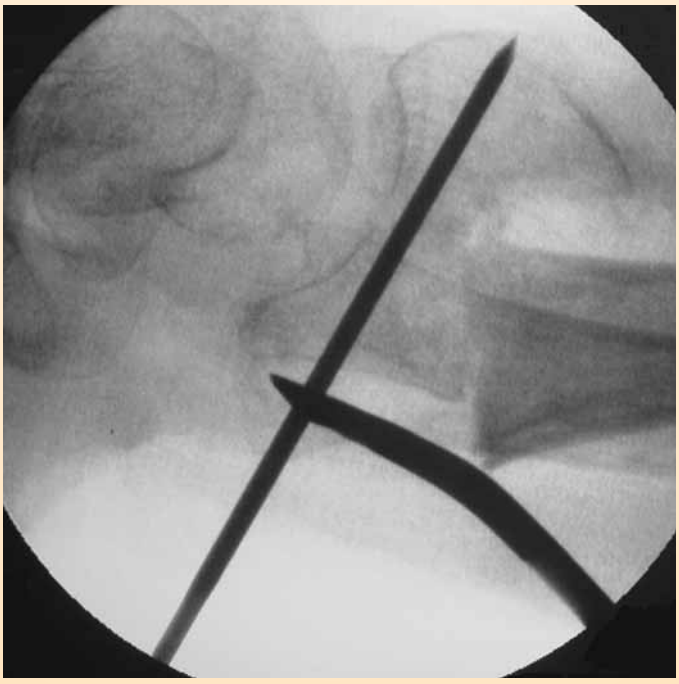
- The Pronator Quadratus should be repaired over the plate, this will add stability to the distal radio-ulnar joint

FINAL X-RAY

- Obtain final radiographic views

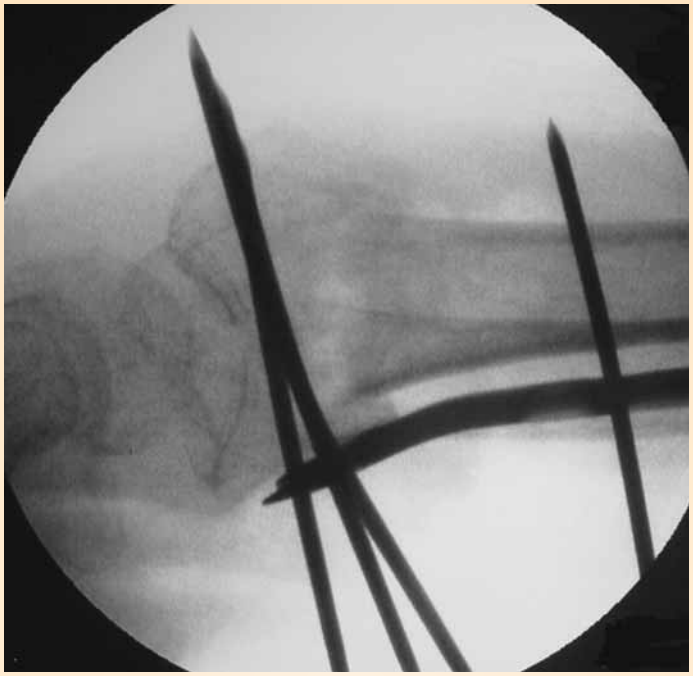
ALTERNATE DISTAL FRAGMENT FIRST TECHNIQUE





- 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



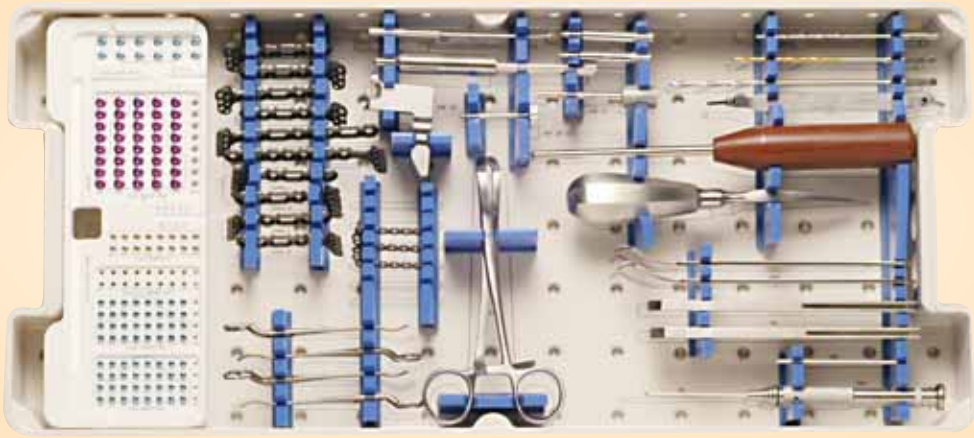
- Reduce the deformity
- Apply pegs, screws and remove temporary k-wires
- Obtain radiographic confirmation

POST OPERATIVE MANAGEMENT

- 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

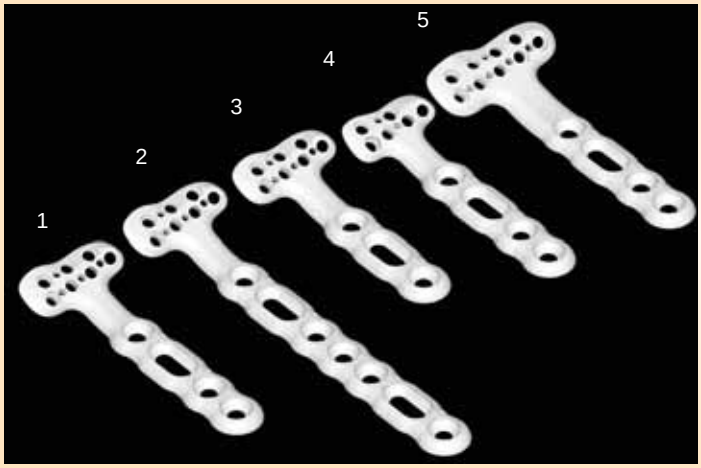
TOLL FREE (800)800.8188 | TEL (305)412.8010 | FAX(305)412.8060 | WWW.HANDINNOVATIONS.COM



PART NUMBER	PRODUCT DESCRIPTION
DVRA-R	DVRA, Standard, Right
DVRA-L	DVRA, Standard, Left
DVRAX-R	DVRA, Extended, Right
DVRAX-L	DVRA, Extended, Left
DVRAS-R	DVRA, Short, Right
DVRAS-L	DVRA, Short, Left
DVRAN-R	DVRA, Narrow, Right
DVRAN-L	DVRA, Narrow, Left
DVRAW-R	DVRA, Wide, Right
DVRAW-L	DVRA, Wide, Left
RHS	Hockey Stick Plate, Right
LHS	Hockey Stick Plate, Left
STR	Fragment Plate - Straight
YFP	Fragment Plate - Y
KW-062	K-Wire .062
P-14	Peg, Smooth, 2.0mm, 14mm Long
P-16	Peg, Smooth, 2.0mm, 16mm Long
P-18	Peg, Smooth, 2.0mm, 18mm Long
P-20	Peg, Smooth, 2.0mm, 20mm Long
P-22	Peg, Smooth, 2.0mm, 22mm Long
P-24	Peg, Smooth, 2.0mm, 24mm Long
P-26	Peg, Smooth, 2.0mm, 26mm Long
P-28	Peg, Smooth, 2.0mm, 28mm Long
TP-14	Peg, Threaded, 2.5mm, 14mm Long

PART NUMBER	PRODUCT DESCRIPTION
TP-16	Peg, Threaded, 2.5mm, 16mm Long
TP-18	Peg, Threaded, 2.5mm, 18mm Long
TP-20	Peg, Threaded, 2.5mm, 20mm Long
TP-22	Peg, Threaded, 2.5mm, 22mm Long
TP-24	Peg, Threaded, 2.5mm, 24mm Long
TP- 26	Peg, Threaded, 2.5mm, 26mm Long
TP- 28	Peg, Threaded, 2.5mm, 28mm Long
SP-14	Cancellous Screw, 2.5, 14mm Long
SP-16	Cancellous Screw, 2.5, 16mm Long
SP-18	Cancellous Screw, 2.5, 18mm Long
SP-20	Cancellous Screw, 2.5, 20mm Long
SP-22	Cancellous Screw, 2.5, 22mm Long
SP-24	Cancellous Screw, 2.5, 24mm Long
SP-26	Cancellous Screw, 2.5, 26mm Long
SP-28	Cancellous Screw, 2.5, 28mm Long
CS-10	Cortical Screw, 3.5, 10mm
CS-12	Cortical Screw, 3.5, 12mm
CS-14	Cortical Screw, 3.5, 14mm
CS-16	Cortical Screw, 3.5, 16mm
CS-18	Cortical Screw, 3.5, 18mm
DB-2.0	Drill Bit 2.0mm
DB-2.5	Drill Bit 2.5mm
DB-3.2	Drill Bit 3.2mm

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)

for more information contact:

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