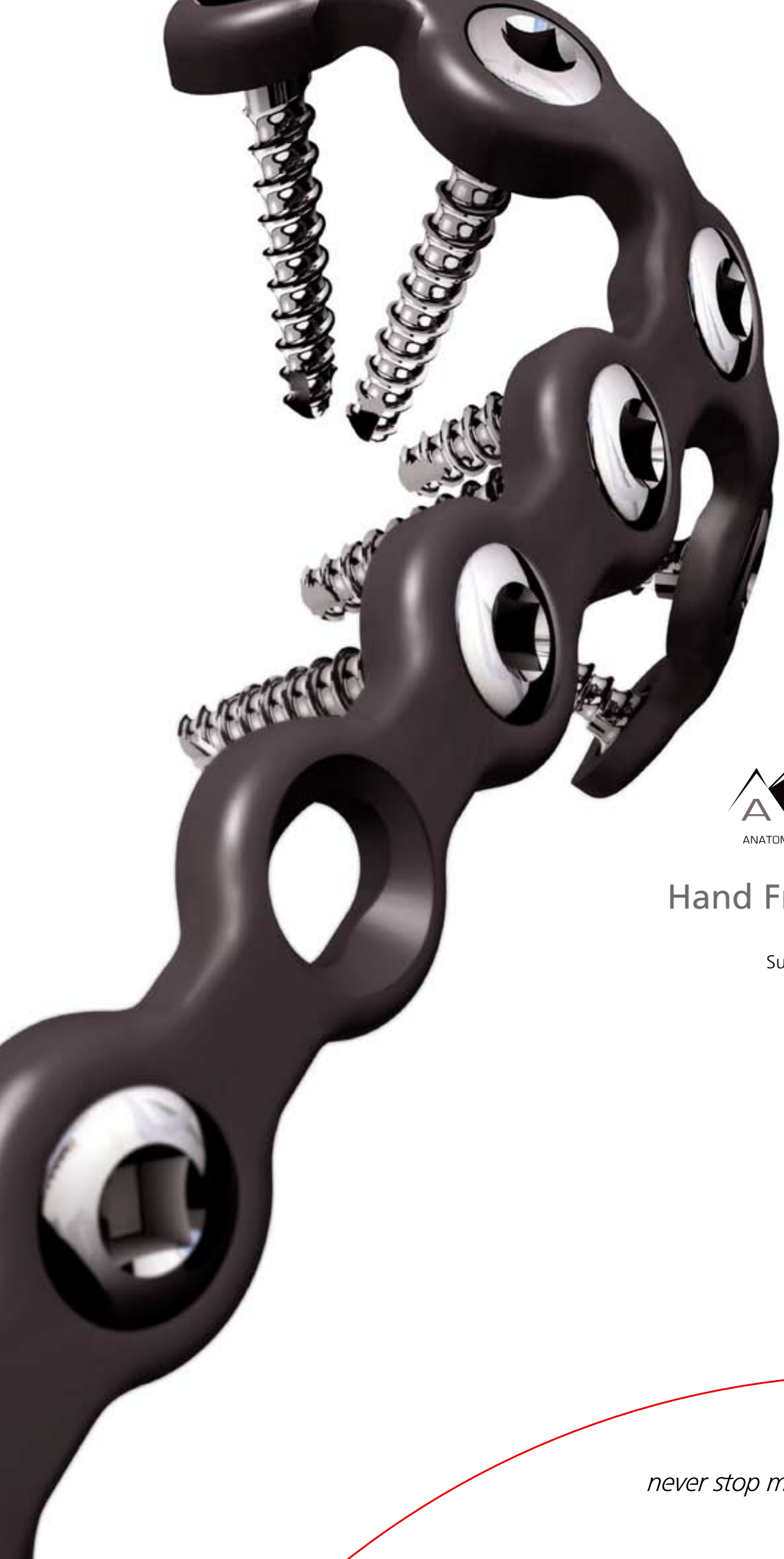


ANATOMIC LOCKED PLATING SYSTEM

Hand Fracture System

Surgical Technique

never stop moving™

DePuy
a Johnson & Johnson company

Contents

Introduction

Extensive DePuy experience and know-how acquired on the development of locking technology has been used to design a revolutionary system for the management of small bone fractures. The A.L.P.S. Hand Fracture System combines the benefits of low profile titanium plate metallurgy with the advantages of multiplanar locked screw technology.

A three dimensional matrix of fixed and variable angle screws creates a true subchondral scaffold, providing improved fixation. This may be particularly beneficial in comminuted fractures or osteoporotic bone.

To understand the challenges associated with treatment of this specific anatomical area, DePuy consulted a wide range of experienced surgeons, reviewed clinical data and carried out biomechanical testing.

A team of leading surgeons were involved in developing the final system:

- Dr Matthew M Tomaino
- Dr Lloyd P Champagne
- Dr Brian J Hartigan

Intended Use

The A.L.P.S Hand Fracture System is intended for stabilisation and fixation of small bone fragments in fresh fractures, revision procedures, joint fusion and reconstructions of small bones of the hand, foot, wrist, ankle, humerus, scapula, finger, toe, pelvis and craniomaxillofacial skeleton.

The A.L.P.S. Hand Fracture System

Flexible Plating Technology

Three dimensional in-situ contouring in the axial, coronal and sagittal planes to help match the most complex bone surfaces.

Proprietary F.A.S.T. Guide™ Technology

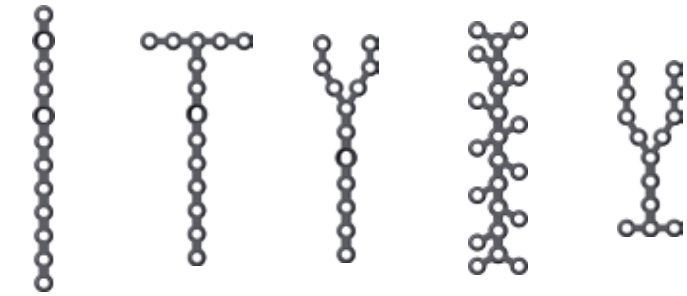
The Hand Fracture System Plates come pre-loaded with Fixed Angle Screw Targeting Guides – F.A.S.T. Guide™ technology – facilitating accurate drilling and providing leverage for intraoperative customisation.

Drilling through F.A.S.T. Guide™

In-situ contouring

Minimal Inventory

Five core plates designed to be customised to suit fracture complexity.



Straight T Y Web T/Y

Locked Plating System

Locking screw technology allows for a strong, stable construct.

Anatomically Pre-Contoured Plates

The 1.5 mm and the 2.5 mm locking plates from the Hand Fracture System are pre-contoured to conform to bone anatomy for simplicity of use.

Multiple Screw Options

Locking, non-locking and multi-directional screw options offer flexibility in fracture treatment.

User Friendly System Design

Intuitive set layout and simple instrumentation allow for convenience in surgery. Clear colour coding for accurate identification of components.

Low Profile Titanium Implants

Each plate is manufactured from TiMAX™ anodised titanium alloy Ti-6Al-4V for superior fatigue strength and excellent biocompatibility. Thin, low profile plate/screw construct may help minimise discomfort, reduce soft tissue irritation and allow easy contouring or cutting of the plate.

1.5 mm Locking Plates

Primary Indication: Phalangeal Fractures

Pre-loaded F.A.S.T. Guide™

Compression Holes:
0.75 mm of compression per hole

Pre-contoured Plate

TiMAX™ anodised
titanium alloy Ti-6Al-4V

Y Plate allows longitudinal fractures to be addressed obliquely and is shaped to go around tendon insertion

Threaded holes can accept Locking, Non-Locking, and Multidirectional screws

Configurations

Straight T Y Web T/Y

Screws

1.5 mm Locking Cortical Screw

- Self-tapping to minimise the need for pre-tapping and ease screw insertion
- Locking screw head minimises screw back-out and construct pullout
- CoCr for strength
- Square drive
- Available in range of lengths 8-24 mm

1.5 mm Non-Locking Cortical Screw

- Self-tapping to minimise the need for pre-tapping and ease screw insertion
- TiMAX™ titanium alloy
- Square drive
- Available in range of lengths 8-24 mm

1.3 mm Non-Locking Cortical Screw

- Stand-alone inter-fragmentary screw
- Self-tapping to minimise the need for pre-tapping and ease screw insertion
- CoCr for strength
- Cruciate head design
- Available in range of lengths 8-24 mm

2.5 mm Locking Plates

Primary Indication: Metacarpal Fractures

Pre-loaded F.A.S.T. Guide™

Compression Holes:
1 mm of compression per hole

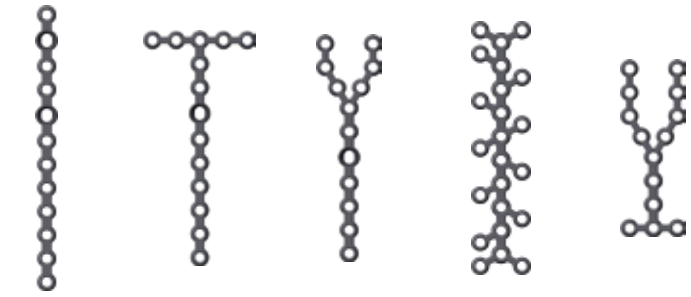
Pre-contoured Plate

TiMAX™ anodised
titanium alloy Ti-6Al-4V

Flexible arms to conform to bone anatomy

Threaded holes can accept Locking, Non-Locking, and Multidirectional screws

Configurations



Straight T Y Web T/Y

Screws

2.5 mm Locking Cortical Screw

- Self tapping tip
- Locking screw head
- Square drive
- TiMAX™ titanium alloy
- Available in lengths of 8-28 mm

2.5 mm Non-Locking Cortical Screw

- Self tapping tip
- Square drive
- TiMAX™ titanium alloy
- Available in lengths of 8-28 mm

2.5 mm Multi-Directional Locking Cortical Screw (MDTP)

- CoCr Screws create new thread path in the plate
- Locking screw head
- Square drive
- Available in lengths of 10-28 mm

2.5 mm Compression Washer

- Converts a 2.5 mm Locking Cortical Screw into a compression screw

Plate Options

The A.L.P.S. Hand Fracture System plates can be modified to meet the needs of the patient and the fracture. The plates can be shortened, cut, or shaped to create an almost infinite array of plate constructs.

The following figures demonstrate some of the plate shapes that can be created from the basic five shapes.

Straight Plate

T Plate

Web Plate

Y Plate

T/Y Plate

Surgical Technique

1. Assess the Fracture Fluoroscopically

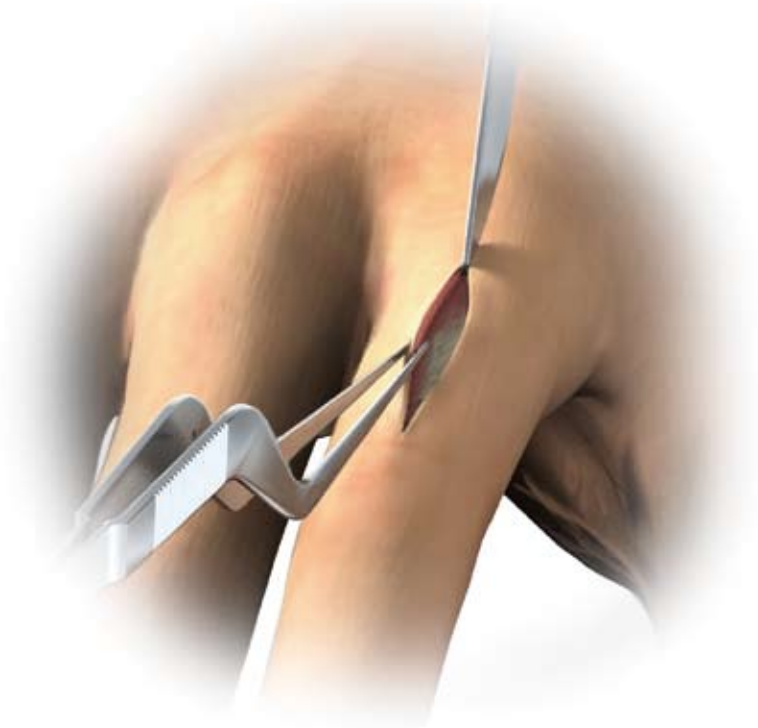
Assess the fracture based on preoperative radiographs and/or intraoperative fluoroscopy.

Assessment needs to consider fracture, comminution, bone loss, and geometry.

Fixation may require simple interfragmentary screw fixation, use of plate and screws, compression at the fracture site, and supplementation with bone graft.

In the absence of malrotation or shortening, simple plate application with locking technology provides rigidity and may allow early motion.

In the presence of clinically relevant displacement (rotation, shortening, angulation) anatomic reduction should precede plate application or be provided via in-situ adjustment of the fracture prior to final plate fixation.



2. Make an Incision

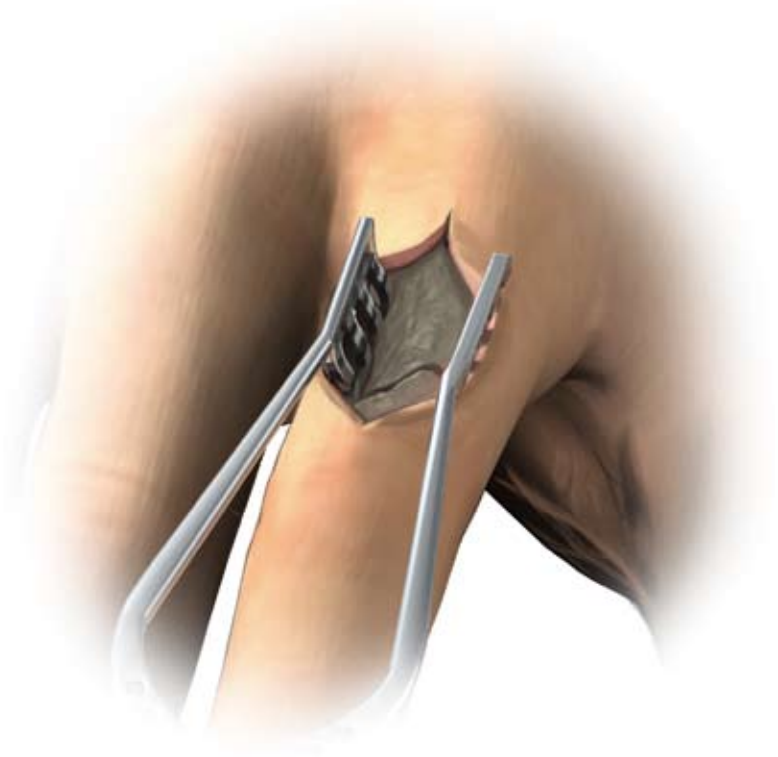
While dorsal surgical approaches to metacarpal fractures and both dorsal and lateral approaches to phalangeal fractures are feasible, the decision regarding where to make an incision and its length are subject to surgeon preference.

While extensor tendon complications potentially complicate the use of plates, both the low profile design and the potential for early postoperative range of motion afforded by locking technology may minimise extensor tendon adherence.

3. Reduce the Fracture

After adequate exposure and irrigation of hematoma, the fracture should be reduced.

This can usually be afforded based on visual cues, but when comminution exists, the use of intraoperative fluoroscopy may be helpful.



4. Achieve Temporary Stabilisation

Achieve provisional stabilisation of the fracture and assess optimal fixation.

This may require the use of towel clamps or other types of reduction clamps.

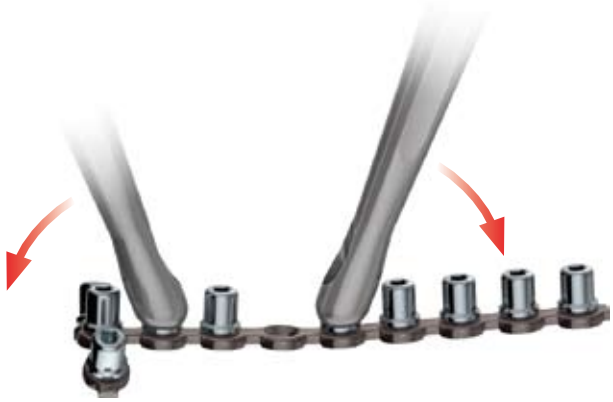
Provisional fixation with K-wires may also be necessary.

Surgical Technique

5. Determine Optimal Plate Shape

Select the proper plate size (either 1.5 mm for phalangeal fractures or 2.5 mm for metacarpal fractures).

Transverse diaphyseal fractures require straight plates; depending on the fracture geometry the other plate shapes can be utilised.



6. Prepare the Plate Length

Plates can be shortened by using the benders. In addition plate cutters are provided in the set.

Plate benders can be inserted into the F.A.S.T Guide™ inserts for plate contouring prior to fixation (see step 12).

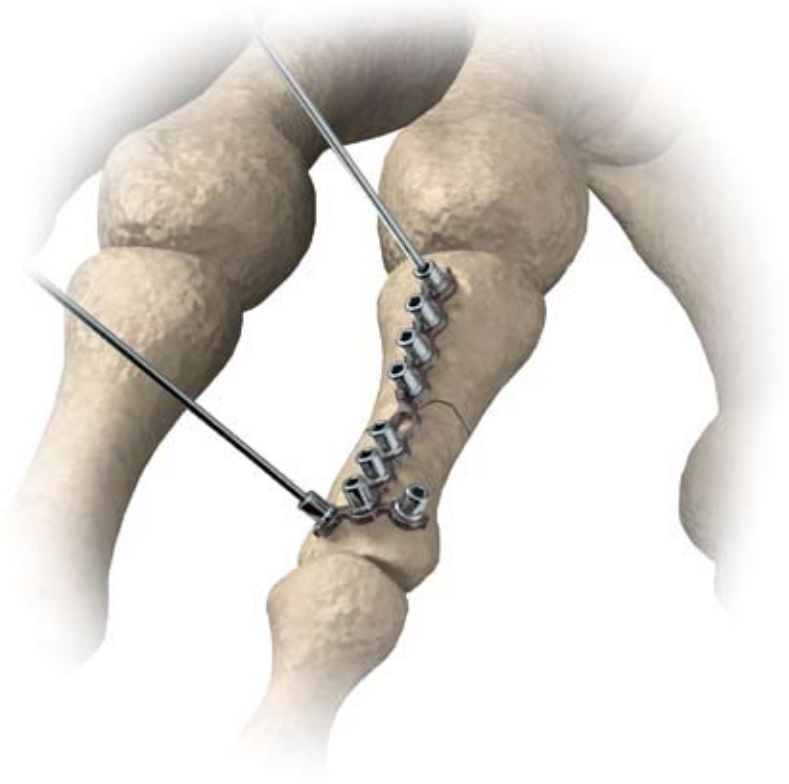
NOTE: When shortening with the benders, it is recommended that you straddle the bridge to be removed with the benders and simply bend toward the bottom of the plate until it releases. This should put the broken edge of the plate facing toward the bone, keeping it hidden from the soft tissues.

NOTE: Instruments are colour coded:

- Gold instruments match the 2.5 mm gold F.A.S.T. Guide™
- Silver instruments match the 1.5 mm silver F.A.S.T. Guide™
- Bronze instruments are used for the 1.3 mm screws

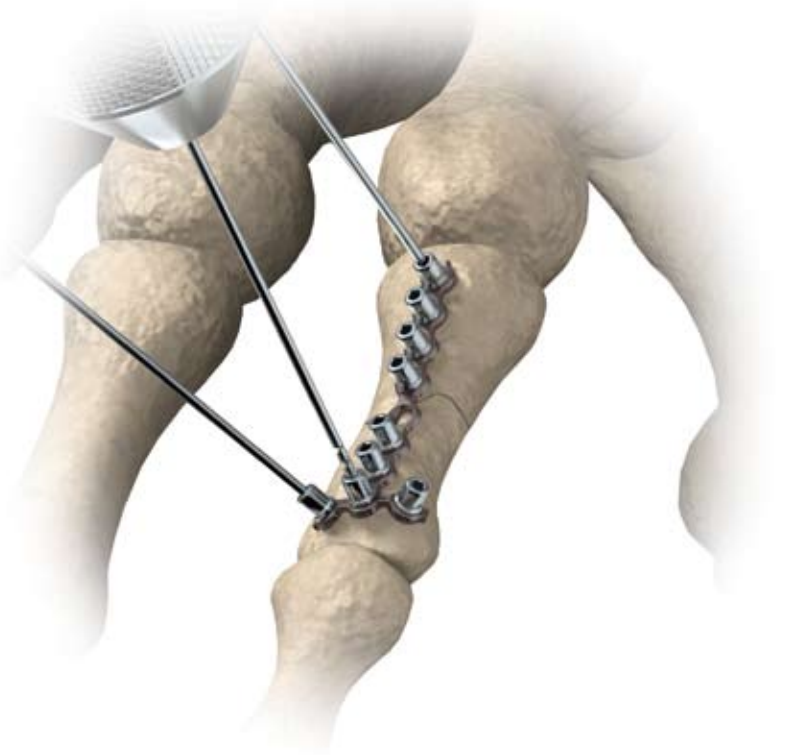
7. Achieve Temporary Fixation of the Plate

Achieve provisional fixation of the plate to the bone by using K-wires or reduction clamps.

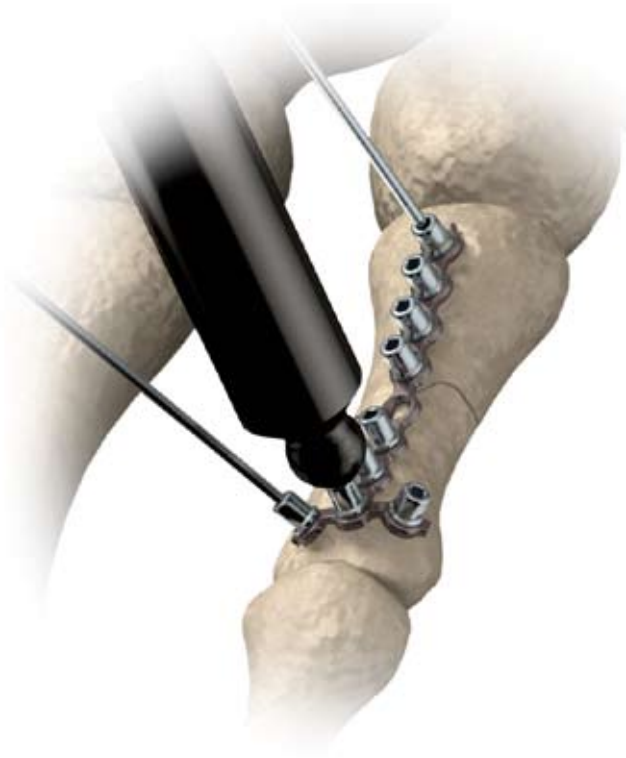


8. Drill

Drill with the appropriate drill bit (1.1 mm silver drill for a 1.5 mm screw and 2.0 mm gold drill for a 2.5 mm screw).



Surgical Technique



9. Determine Screw Length Through the F.A.S.T. Guide™

Assess carefully the length of the screw with the bone depth gauge.

NOTE: The bone depth gauge has two scales depending on whether the tool is used before or after the FAST Guide™ is removed.

10. Remove F.A.S.T. Guide™

Use the screw driver to remove the F.A.S.T. Guide™ by pressing the screw driver tip into the F.A.S.T. Guide™ and turning counter clockwise to disengage the guide.

NOTE: Each F.A.S.T. Guide™ is disposable and all guides must be removed.

11 Insert Appropriate Screw

Each locking hole provides the option for either a locked fixed angle, locked multi-directional, or non-locking screw.

The 2.5 mm MDTP is the locked multi-directional screw for the 2.5 mm plates and the 1.5 mm locked screw can both be locked into the plate off-axis if desired (20˚ cone).

The 2.5 mm locking screws with a washer and the 1.5 mm non-locked screws can be used in the compression holes to provide compression to a fracture site.

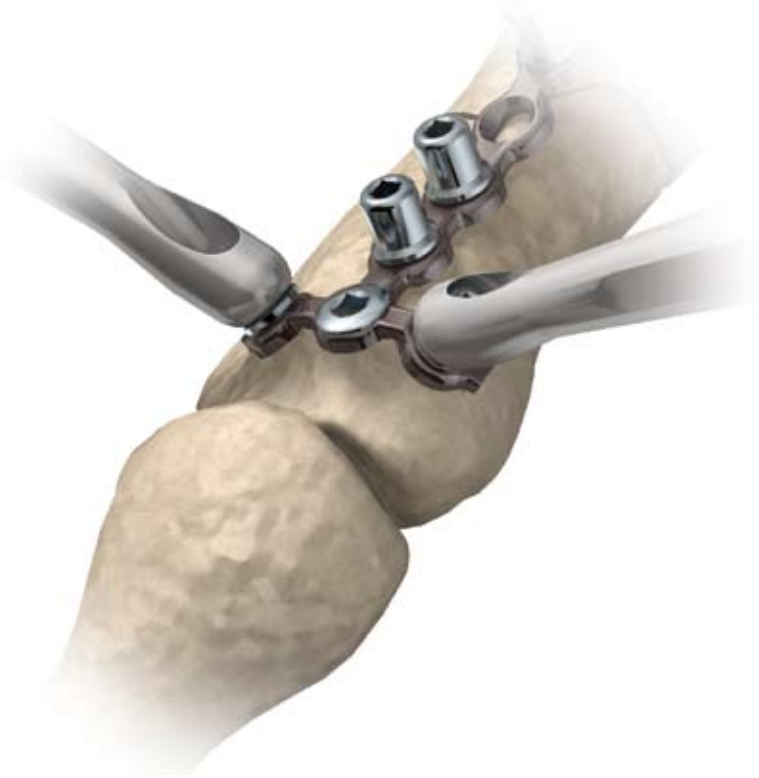
12. Contour Plate as Desired

If further contouring is required bend, twist and curve the plate by using the benders.

To bend or twist a plate in the axial or coronal plane, place the long end of the bender over (1.5 mm) or into (2.5 mm) the F.A.S.T. Guide™ of adjacent nodes. Hold one bender as an anchor and manipulate the other.

To curve a plate sagittally, place the short end of the benders over the F.A.S.T. Guide™ of adjacent nodes. Hold one bender as an anchor and curve with the other.

NOTE: The benders are a matched pair. If curving an end node use the End Node bender at that position.



Surgical Technique

13. Achieve Final Plate Fixation

Fill the remaining screw holes with locking or non-locking screws as needed.

Caution: Remove each F.A.S.T. Guide™ even if the screw hole is not used to prevent tissue damage.

14. Postoperative Management

The rigidity of the locking design feature of these plates may enable early mobilisation, which will decrease the risk of joint stiffness and flexor and extensor tendon adherence.

A compressive dressing is recommended with a plaster splint or a bulky "soft" splint placed depending on the surgeon's individual assessment of fixation and patient compliance.

After 5-7 days, early motion of the interphalangeal and MP joints may be possible with intermittent splinting until union, depending on the surgeon's preference and assessment of patient compliance.

Multi-Directional Locking Cortical Screw Insertion

1. Prepare and Drill
Remove each F.A.S.T. Guide™.

Drill through the soft tissue guide with the 2.0 mm drill (for the 2.5 mm MDTP screws) or the 1.1 mm drill (for the 1.5 mm Locking Cortical Screw) in the desired direction.

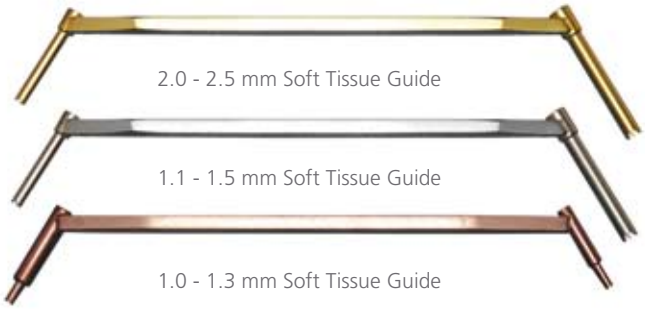
It is recommended that the off-axis angle is no greater than 10˚ off-center (20˚ cone). This recommendation applies to both 1.5 mm Locking Cortical Screws and 2.5 mm MDTP screws.

2. Determine Optimum Screw Length

3. Insert Screws in the Desired Direction.
If necessary, re-drill and reinsert the screw in the desired direction.

4. Lock Screw Into the Plate
Note: It is possible, with enough force, to drive the 2.5 mm MDTPs through the plate. Stop advancing when the head of the screw is flush with the surface of the plate. When inserting the 1.5 mm screws off-axis, the top of the screw will stand slightly proud of the plate.

Instruments



2.0 - 2.5 mm Soft Tissue Guide

1.1 - 1.5 mm Soft Tissue Guide

1.0 - 1.3 mm Soft Tissue Guide

Screw Pickup
(shown with 1.3 mm Cruciate Driver)

1.5 mm Plate Holder

2.5 mm Plate Holder

1.3 mm/1.5 mm Bone Depth Gauge

2.0 mm/2.5 mm Bone Depth Gauge

2.5 mm Plate Benders

2.5 mm Plate Benders

The Hand Fracture System instrumentation provides the surgeon with all the tools needed to perform a hand fracture procedure.

The modules have been colour coded so that the bronze instruments are used with 1.3 mm screws, silver instruments are used with 1.5 mm plates and screws, and gold instruments are used with 2.5 mm plates and screws. Similar colour coding is extended to the F.A.S.T. Guide™ on the plates, creating a simple and convenient identification system.

K-Wire Reduction Clamp
(use with K-Wires that are 1.1mm or smaller)

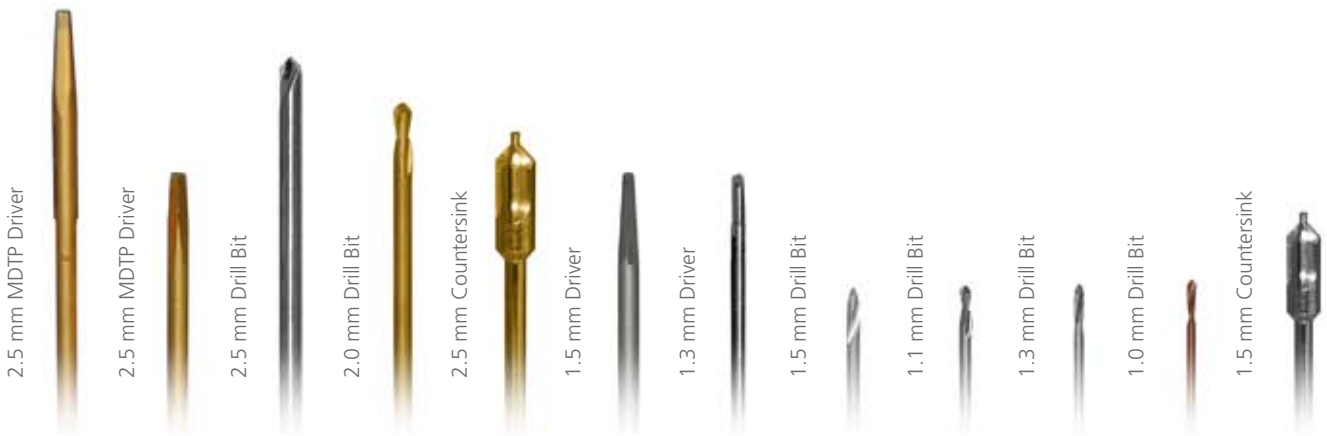
Small Reduction Clamps

Cutting Pliers

Elevator

Mini Quick Connect Handles (MQC)
Handles (2)

Retractors (2)



1.5 mm Plate Specifications



Plate Style	Straight	T	Y	Web	T/Y
Plate Width	4.3 mm	20.4 mm	13.8 mm	12.8 mm	14.1 mm
Plate Thickness	1.1 mm	1.1 mm	1.1 mm	1.1 mm	1.1 mm
Lengths	61.7 mm	56.3 mm	49.6 mm	46.0 mm	39.3 mm

2.5 mm Plate Specifications





Plate Styles	Straight	T	Y	Web	T/Y
Plate Width	6.8 mm	27.6 mm	19.5 mm	17.4 mm	19.5 mm
Plate Thickness	1.65 mm	1.65 mm	1.65 mm	1.65 mm	1.65 mm
Lengths	90.2 mm	73.8 mm	71.8 mm	79.8 mm	55.5 mm

Ordering Information

1.5 / 1.3 mm Module

1312-20-151	1.5 mm Locking Plate, Straight
1312-20-152	1.5 mm Locking Plate, T-Shape
1312-20-153	1.5 mm Locking Plate, Y-Shape
1312-20-154	1.5 mm Locking Plate, T/Y-Shape
1312-20-155	1.5 mm Locking Plate, Web
1312-20-157	1.5 mm Locking Plate, T Small
1312-20-308/ 1312-20-324	Non Locking Screw 1.3 mm x 8 mm/24 mm
1312-20-508/ 1312-20-524	Non Locking Screw 1.5 mm x 8 mm /24 mm
1312-20-408/ 1312-20-424	Locking Screw 1.5 mm x 8 mm/24 mm
2312-20-200	1.0 mm Drill Bit with Mini-Quick Connect
2312-20-201	1.3 mm Drill Bit with Mini-Quick Connect
2312-20-202	F.A.S.T. 1.1 mm Drill Bit with Mini-Quick Connect
2312-20-203	1.5 mm Drill Bit with Mini-Quick Connect
2312-20-206	1.3 mm/1.5 mm Countersink
2312-20-208	1.3 mm Driver Bit
2312-20-209	1.5 mm Driver Bit
2312-20-109	1.5 mm plate Holder
2312-20-102	1.5 mm Plate Bender
2312-20-103	1.5 mm Plate Bender End
2312-20-106	1.0 mm/1.3 mm Soft Tissue Guide
2312-20-116	1.1 mm/1.5 mm Soft Tissue Guide
2312-20-104	1.3 mm/1.5 mm Bone Depth Gauge
2312-20-210	Screw Pickup

2.5 mm Module

1312-20-251	2.5 mm Locking Plate, Straight
1312-20-252	2.5 mm Locking Plate, T-Shape
1312-20-253	2.5 mm Locking Plate, Y-Shape
1312-20-254	2.5 mm Locking Plate, T/Y-Shape
1312-20-255	2.5 mm Locking Plate, Web
SP08000/ SP28000	Screw Peg 2.5 mm x 8 mm/28 mm
FP08/FP28	Fully Threaded Peg 2.5 mm x 8 mm/28 mm
1312-11-110/ 1312-11-128	MDTP screw 2.5 mm x 10 mm/28 mm
1312-20-025	2.5 mm Threaded Washer
2312-20-204	F.A.S.T. 2.0 mm Drill Bit with Mini-Quick Connect
2312-20-205	2.5 mm Drill Bit with Mini-Quick Connect
2312-20-207	2.0 mm/2.5 mm Countersink
2312-20-211	2.0 mm/2.5 mm Driver Bit
2312-11-002	MDTP Driver Bit
2312-07-012	2.0 mm Plate Holder
2312-20-100	2.0 mm Plate Bender
2312-20-101	2.0 mm Plate Bender End
2312-20-107	2.0 mm/2.5 mm Soft Tissue Guide
2312-20-105	2.0 mm/2.5 mm Bone Depth Gauge

Instrument Tray

MQC	MQC Handle
2312-20-114	Cutting Pliers
9399-99-469	Periosteal Elevator 3 mm
9399-99-518	Reduction Small Clamps (Towel)
9399-99-444	Reduction Standard Clamps (Lobster)
9399-99-277	Retractor Mini Hohmann
2312-20-115	K-Wire Towel Clamp
1642-06-028	K-Wire 6" Trocar Point .028 OD
1642-06-035	K-Wire 6" Trocar Point .035 OD
1642-06-045	K-Wire 6" Trocar Point .045 OD
1642-06-062	K-Wire 6" Trocar Point .062 OD

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