FEATURES

- Recessed plate reduces the possibility of dorsal impingement
- Circular design promotes inter-carpal fusion
- Screw hole positioning allows for 2 screws in each bone
- Open center hole allows for additional bone graft and visualization
- Simple and straightforward instrumentation
- Instant rigid fixation for "four corner" fusion

PART NO. DESCRIPTION SIZE

Implants
07-0005 Spider Plate (8-Hole)
07-0006 Mini-Spider Plate (6-Hole)

2.4mm Bone Screws
07-2408 Bone Screw 8mm
07-2410 Bone Screw 10mm
07-2412 Bone Screw 12mm
07-2414 Bone Screw 14mm

2.8mm Bone Screws
07-2810 Bone Screw 10mm
07-2814 Bone Screw 14mm
07-2818 Bone Screw 18mm
07-5000 Instrument Set

COMPONENT MATERIALS

- 8-Hole and 6-Hole Plate: Stainless Steel
- Screws: Stainless Steel
**Description**
The Spider Limited Wrist Fusion System consists of two stainless steel plates, featuring an 8-hole and a 6-hole design. Both plates have a unique three-dimensional design optimized for four-corner and other limited wrist fusion procedures. The Spider plates sit just below with the dorsal aspect of the carpus and can be utilized in various locations in the wrist.

**THE SPIDER SYSTEM**
- Promotes intercarpal fusion by pulling the bones toward the center of the circular plate creating a stable construct.
- Easier to use than K-wires, staples, screws, etc.
- Instant rigid fixation.
- Allows for earlier motion.
- Recessed plate design - eliminates dorsal impingement.
- Multiple options - can be used in various locations in the wrist.
- Open center hole - allows for additional bone graft and visualization.

**Indications**
- Osteoarthritis
- Rheumatoid arthritis
- Post-traumatic or degenerative wrist arthritis
- Complex fractures of the wrist
- Revision of failed partial wrist fusion
- Carpal instability

**Contraindications**
- Severe tendon, neurological or vascular deficiencies that may compromise the affected extremity
- Any concomitant disease that may compromise the function of the plate
- Infection

**Technique Summary**
- Dorsal incision, capsular incision, excision of scaphoid
- Reduction of DISI deformity (if necessary)
- Provisional K-wire fixation
- Ream the four-corner region
- Denude the cartilage
- Harvesting cancellous bone graft (from the distal radius)
- Bone grafting
- Application of the Spider plate and screws
- Closure

**Spider™ Surgical Technique**

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**Spider™ Surgical Technique**

- **Spider Rasp Brush**
- **Spider Rasp (Disposable)**
- **T-Handle**
- **Mini-Spider Rasp (Disposable)**
- **Spider Plate Holder/Drill Guide**
- **Mini-Spider Plate Holder/Drill Guide**
- **Drill Guide**
- **2.5mm Hex Driver**
- **Drill Bits (Disposable)**
- **Bone Screws**
- **Mini-Spider Plate**
- **Spider Plate**
- **Screw Holding Forceps**
- **Quick Couple Driver**
- **Depth Gauge**
- **3.5mm Tap**
The Spider Limited Wrist Fusion Plate (8-holes) can be utilized in various locations throughout the wrist depending on the procedure being performed. The plate has been used successfully for:

- Lunotriquetrocapitate-hamate (four corner) fusion
- Scapho-capitate (SC) fusion
- Radioscapholunate (RSL) fusion
- Scapholunacapitate (SLC) fusion
- Scaphotrapezium trapezoid (STT) fusion.

Preparation of the site to be fused and the specific techniques are fairly similar regardless of where the fusion is desired. The larger Spider plate’s design is optimized for four-corner limited arthrodesis. The plate can also be utilized for other limited wrist fusion procedures for which the plate is appropriately sized.

**SURGICAL APPROACH**

**Skin Incision and Exposure**

- A longitudinal incision is made centered over the dorsal wrist or a transverse incision can be utilized (Figure 1).
- Dissection is carried down through the subcutaneous tissues taking care to protect the sensory branch of the radial and ulnar nerve fibers.

**Exposure for SLAC Deformities That Require Scaphoid Excision**

- Exposure is undertaken through the third dorsal compartment transposing the extensor pollicis longus tendon radially.
- The Incision is taken from the third compartment, between the second and fourth compartments, distally through the capsule exposing the scaphoid.
- The scaphoid is generally removed using a rongeur, taking care to protect the extrinsic ligaments.
- A radial styloidectomy may be indicated.
- Exposure of the four-bone region encompassing the lunate, triquetrum, capitate, and hamate can be undertaken through this incision (Figure 2).

**Additional Incision Options**

- A separate longitudinal incision can be made between the fourth and fifth compartments, or an anatomical dorsal ligament-sparing approach can be used for direct exposure to the four-bone region.
- These techniques are also utilized in patients who undergo a four-corner fusion for stability alone where the scaphoid does not require excision.

**Postoperative Care**

- Irrigation and debridement of the wound is undertaken and sequential repair of the capsule is performed.
- The distal aspect of the extensor retinaculum is transposed under the EPL and utilized as a flap at the distal radius.
- After skin closure, a short-arm splint is placed allowing early active finger range of motion.
- After the sutures have been removed at approximately 10-14 days, either a removable splint can be used to allow early range of motion exercises, or a short-arm cast can be placed for three to four weeks of protection.
- Radiographs should be taken on a sequential basis to ensure appropriate fusion of the STT regions prior to allowing return to normal activities.

**APPLICATION OF THE MINI-SPIDER PLATE**

- Using the Mini-Spider Plate Holder/Drill Guide instrument, rotate the plate for optimal alignment, allowing for two screws in each of the STT bones (Figure 7).
- For hole placement, use either end of the Plate Holder/Drill Guide” (Figure 7A).
- Anatomic considerations may permit only one screw in the trapezoid.
- Proper screw depth and placement should not compromise the 1st CMC joint or the capitate articulation.
- Tighten all the screws in a balanced fashion.
- Intraoperative fluoroscopy and standard AP and lateral radiographs are undertaken to ensure appropriate placement and screw fixation.
- Range of motion testing is also performed.
- Additional bone graft can be packed into the center portion of the STT fusion through the plate (Figure 8).

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**Spider Surgical Technique**

**STEP 2**

**REDUCTION / PROVISIONAL K-WIRE FIXATION**

- After appropriately exposing the capitate, hamate, lunate and triquetrum, any rotational instability is reduced and temporary percutaneous K-Wire fixation is accomplished keeping the 1.1 mm (.045") K-Wires as volar as possible within the four bones (Figure 2A).

- It is especially important to ensure complete reduction of the lunate (Figure 2A).

- Provisional fixation in the volar half of the carpal bones being fused tends to produce less toggle in the carpus while rasping is performed (this provides a more uniform, recessed defect to accept the plate and bone graft (Figure 2B).

**STEP 3**

**RASPING**

- The Spider Rasp is centered both A/P and laterally over the four-corner junction and used to rasp down, at least flush with, or even below, the bone surface of the dorsal aspect of the carpus (Figure 3 and Figure 9).

- The defect from the Spider Rasp exactly complements the size, shape and contour of the Spider Plate.

- Rasping can be done manually or with a power attachment.

**STEP 4**

**DENUDE THE CARTILAGE**

- A small Rongeur is used to denude the cartilage between the four bones down through subchondral bone to good cancellous bone (Figure 4).

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**STEP 5**

**BONE GRAFTING**

- Autogenous cancellous bone graft is taken from Lister’s tubercle or from the iliac crest.

- The graft is packed between each of the joint surfaces and the junction of the STT fusion down through the volar aspect of the rasped defect.

- It is important that no bone graft has extruded into the scapho-capitate joint space (Figure 5).

**STEP 6**

**APPLICATION OF THE MINI-SPIDER PLATE**

- Place the Mini-Spider Plate into the rasped defect.

- Ensure that the plate is at least flush or recessed relative to the level of the remaining dorsal carpal cortex.

- Confirm proper alignment and adequate recession of the plate utilizing fluoroscopy (Figure 6).
**SCAPHOID REDUCTION**

- If the scaphoid is *subluxed*, reduction to normal anatomic position is facilitated by introducing an instrument such as a *hemostat* under the *distal pole* of the scaphoid in line with the radioscapho-capitate ligament.

- Using the hemostat, *de-rotate the scaphoid*, bringing the proximal articulation of the scaphoid into a normal anatomic alignment with the radial fossa.

- Provisional *pinning* is utilized to maintain reduction throughout the procedure.

**PROVISIONAL K-WIRE FIXATION**

- The provisional K-Wire fixation *maintains the reduction*, provides *a resistance* to the Rasp, *prevents tooggling* of the bones and produces a more uniform defect for the plate.

- Two 1.1mm (.045") K-Wires are inserted parallel through the scaphoid into the capitate to fixate the scaphoid.

- K-Wires are positioned to avoid the rasped defect and they *should not engage the radiocarpal joint* (Figure 2).

- If indicated, additional K-Wires may be inserted, fixating the trapezium to the trapezoid and retrograde fixation of the trapezoid to the scaphoid.

**RASPING**

- The Mini-Spider Rasp is *centered* over the STT joint and used to rasp down, *at least flush with or even below* the bone surface of the dorsal aspect of the carpus.

- The defect from the Mini-Spider Rasp *exactly matches* the size, shape and contour of the Mini-Spider Plate.

- Rasping can be done manually or with a power attachment (Figure 3).

**APPLICATION OF THE SPIDER PLATE**

- After appropriate packing of the bone graft, the Spider plate is then *aligned* to allow maximum screw placement in each of the four bones (Figure 6).

- Two screws can be placed within each of the four bones.

- Using the Spider Plate *Holder/Drill Guide* instrument, ensure that the plate is at or *below* the level of the remaining carpus (recessed).

- *Confirm proper alignment* and ensure adequate recession of the plate, utilizing fluoroscopy to obtain M/L and A/P views.

- Holding the plate in appropriate alignment and using the Drill Guide, a 1.5mm drill bit is used to place an index screw (fix this screw in the lunate).

- Utilize the *Drill Guide* to perform the *first drilling* of the carpal bone. This allows alignment of the plate and appropriate *centralization* of the drill through one of the holes in the Spider Plate (Figure 7).

- Do not tighten *first screw* placed into the lunate; simply post the screw.

- Drill a *second hole* for screw placement in a diametric orientation to the lunate screw to balance the plate upon initial fixation.

- The *remaining holes* in the Spider plate can be drilled utilizing the drill guide to *allow several degrees of freedom* in the placement of the screws themselves.

- Initially, place *one screw* in each of the four bones, utilizing the 8mm, 10mm, 12mm and 14mm length, with the 2.4mm diameter cancellous self-tapping screws to fix the plate down.

- 2.8mm cancellous self-tapping screws can be utilized as *salvage screws* through the plate should problems occur with the 2.4mm screws that involve lack of purchase in the carpus.

**BONE GRAFTING**

- Autogenous cancellous bone graft *is taken from* either the *Lister’s tubercle in the distal radius*, or from the *iliac crest* is then packed between each of the joint surfaces and the junction of the four-corner fusion at the bottom of the rasped defect (Figure 5).

*NOTE: Excised Scaphoid is not recommended.*
**COMPRESSION OF THE FOUR BONES**

- Screws should be placed in a **tightened fashion** to allow compression of the four bones.
- Remaining screws should be of appropriate length without protrusion and impingement with the articular surfaces (Figure 8 and Figure 9).
- **Intraoperative fluoroscopy** and standard AP and lateral radiographs are undertaken to ensure appropriate placement and screw fixation.
- Range of motion testing is undertaken to ensure excellent **stability and lack of impingement** of the fusion plate.
- Additional bone graft can be packed within the center portion of the four-corner region through the plate itself without difficulty.

**POSTOPERATIVE CARE**

- **Irrigation and debridement** of the wound and sequential repair of the capsule and retinacular structures are undertaken.
- After skin closure, a **short-arm splint** is placed allowing early active finger range of motion.
- After the **sutures** have been removed at approximately **one week**, a removable splint can be placed to allow early active range of motion exercises or a **short-arm cast** can be placed for three to four weeks of protection.
- Radiographs should be taken on a **sequential basis** to ensure appropriate fusion of the four-corner region prior to allowing return to normal activities.

**Surgical Approach**

**Skin Incision and Exposure**

- A dorsal longitudinal **incision** is made over the wrist in line with the scaphotrapezium-trapezoid joint, extending proximally in line with the Extensor Pollicis Longus to Lister's tubercle (Figure 1).
- The extensor retinaculum is incised and released distal to Lister’s tubercle.
- Alternately, a **transverse incision** can be utilized for joint exposure.
- A **radial styloidectomy** may be indicated.