

Surgical Technique

As described by Kai Mazur, M.D.

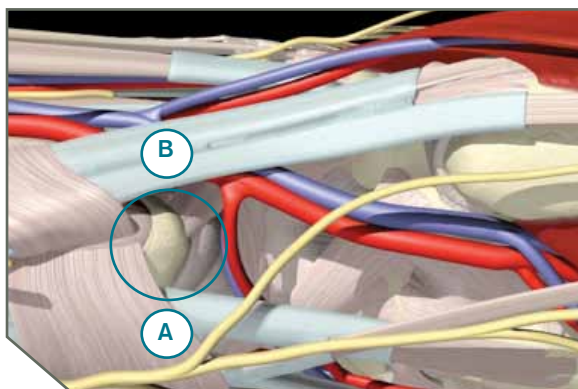
Preparation and Initial Fracture Reduction

- Selection of the implant diameter should be based upon the surgeon's preference and the patient's anatomy. An x-ray overlay template may be used to assist with this assessment.
- Initial fracture reduction can be aided by the use of a bolster created with folded towels placed beneath the wrist.
- Traction can also be applied through the use of finger traps and a 5 lb. weight suspended from the table or use of a traction tower.
- Use of K-wires and/or reduction clamps is optional and at the surgeon's discretion in order to achieve anatomical reduction of the fracture.

- A Freer elevator can be introduced into the fracture site, through a small dorsal incision to aid in the fracture reduction.

Surgical Exposure

- Make a 2-3cm incision, centered over the radial styloid.
- Bluntly dissect through the subcutaneous tissue down to the periosteum between the first and second dorsal extensor compartments to expose the radial styloid.
- Incise the first dorsal compartment extensor retinaculum and free the tendons completely.



- Use a self-retaining retractor to displace the EPB tendon in a dorsal direction and the APL tendon in a volar direction, while protecting the branch of the superficial radial nerve.

Establishing an Entry Point

- Use the 3mm S-Shaped Awl to create an entry point into the cortical bone at the radial styloid.
- Introduce the Awl perpendicular to the bone at the dorsal edge of the first dorsal compartment retinaculum. The entry hole should be just proximal to the scaphoid fossa.
- Position the arc of the 3mm S-Shaped Awl just below the subchondral surface.

Preparing the Intramedullary Canal

- Confirm the position of the 3mm S-Shaped Awl tip and anatomical alignment of the fracture with fluoroscopic x-rays in both A/P and Lateral views, before advancing the Awl across the fracture.
- Use gentle +/- 30-degree rotating motions to advance the 3mm Awl into the IM Canal. As the Awl reaches the midline of the IM Canal and when adequately seated, the handle should be flush against the thumb of the patient's hand.
- Introduce the 5.5mm Cutting Tip Awl to further widen the canal. Use gentle +/- 30-degree rotating motions to advance the 5.5mm Awl into the IM Canal. Once the Awl is adequately seated in the Canal, the handle should be flush against the thumb of the patient's hand.

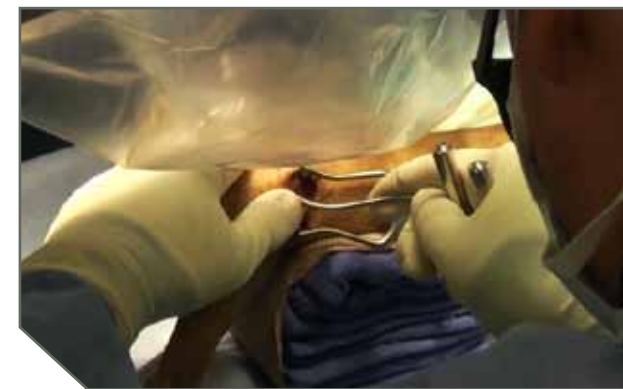
When using the 6470 Implant:

- Repeat the above steps with the 7mm Cutting Tipped Awl, to prepare the IM Canal for the larger diameter 6470 implant.

Determining Implant Diameter

- Assess the size of the IM Canal through use of the Sonoma 5470/6470 x-ray template. The template has sizing guides to account for under and over magnification of the x-ray image.
- Alternatively, the 5.5mm Cutting Tipped Awl can also be used to assess the relative size of the IM Canal. If the Awl tip transitions into the IM Canal with noticeable resistance, select the smaller diameter 5470 implant. If the Awl passes with relative ease into the IM Canal, select the larger 6470 implant.

- The surgeon should use their clinical judgment as to the appropriate size of the implant that best addresses the individual patient's clinical need.



Reaming the Intramedullary Canal

- Insert the J-Tip Guide Wire into the IM Canal and across the reduced fracture. Verify fracture reduction and the position of the Guide Wire in both A/P and Lateral views.
- Insert the back end (non J-Tip end) of the Guide Wire into the distal end of 5.5mm Flexible Reamer with the flexible shaft extended outside of the curved sheath.
- Prepare the Flexible Cannulated Reamer by retracting the flexible shaft fully into the Curved Sheath prior to insertion into bone.
- Advance the entire Flexible Reamer assembly over the guide wire, under manual control or power to ream the IM Canal to the appropriate depth to accept the 70mm implant length.
- Remove the Flexible Reamer assembly and Guide Wire from the IM Canal, prior to device implantation.

Device Implantation

- Confirm that the fracture is properly reduced before inserting the implant and actuating the Fixation Grippers.
- Insert the pre-assembled WRx 5470 or 6470 implant into the bone and verify that the hub is slightly below the surface of the radial styloid. A small notch on the end of the implant hub is visible under fluoro in the AP view. Use this as a guide to appropriately position the implant.
- Position the implant hub in relation to the surface of the bone to ensure that the Buttress Screw will angle in a distal to proximal direction, 1-2mm proximal and parallel to the subchondral surface of the bone.

When using the 6470 Implant:

- Remove the Safety Release Wire attached to the 6470 implant with a gentle pull, once the implant is properly positioned.

Final Reduction and Fixation

- Select the appropriate Flexible Actuation Driver based on implant size.

When using the 5470 Implant:

- Insert the Flexible Actuation Driver with the **Yellow** cap into the back of the implant hub.

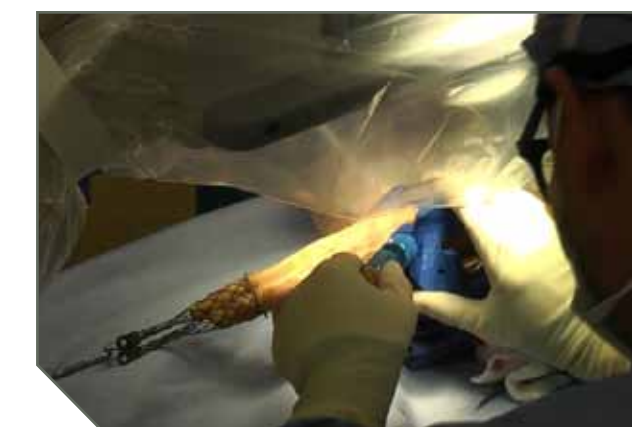
When using the 6470 Implant:

- Insert the Flexible Actuation Driver with the **Green** cap into the back of the implant hub.

- Actuate the Fixation Grippers on the 5470 and 6470 implants by turning the Blue knob in a **clockwise** direction until the lines on the knob are collinear and resistance is felt.

- Confirm satisfactory fixation by using fluoroscopic visualization and by gently pulling on the Outrigger attached to the implant.

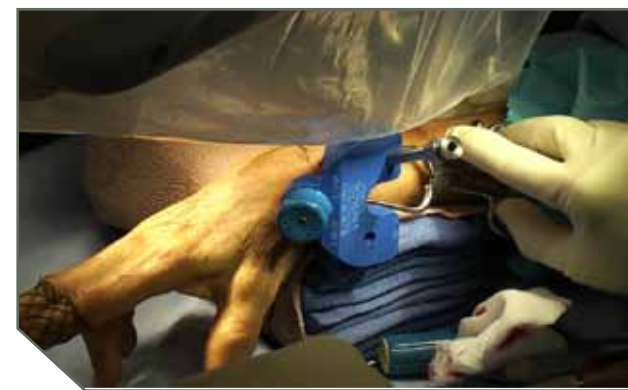
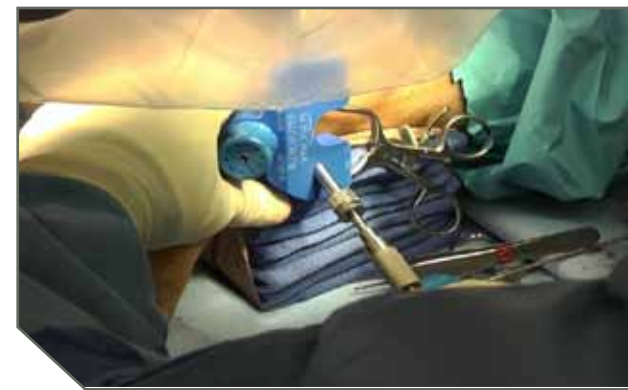
- Remove the Flexible Actuation Driver from the implant hub.



Proximal Screw or Peg Placement

Both 5470 and 6470 implants accept up to three 2.7mm cortical bone screws or pegs. The blue Outrigger acts to align the Drill and Screw Guides, such that screws or pegs pass through designated holes in the implant hub and then into bone. Screws and pegs are self-locking into the implant hub and can be oriented in volar-dorsal or dorsal-volar directions.

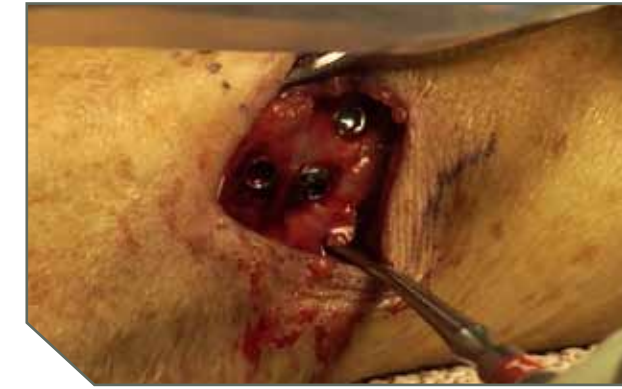
- Insert the External Sheath into the desired hole in the Outrigger and advance the Sheath until it comes in contact with the bone.
- Insert the Drill Guide into the External Sheath and align the keyways until flush.
- Drill a pilot hole into the radius bone using a 2.0mm Drill Bit. Measure the depth using the scale on the Bit shaft.
- Select a Screw or Peg that is 2mm shorter than measured to allow for counter-sinking.
- Remove the Drill Guide and insert the Screw Guide into the External Sheath.
- Insert the Screw into the Screw Guide.
- Use the 2.5mm Hex Driver Bit attached to the Driver Handle to tighten the Screw.
- Repeat the above steps for the second proximal Screw or Peg.



Buttress Screw or Peg Placement

The 2.7mm Buttress Screw/Peg is designed to support the sub-chondral bone and lies mid-line between the Proximal Screws or Pegs.

- Remove the blue Outrigger and Hub Attachment Screw from the back of the implant.
- Under fluoroscopic visualization, drill a pilot hole with the 2.0mm Drill Bit through the Buttress Screw/Peg hole in the implant hub. Do not violate the medial cortical bone.
- Measure the screw depth with the Depth Gauge and select an appropriate length 2.7mm Screw/Peg.
- Place the Screw/Peg through the hole inside the hub of the implant and thread it into the pilot hole.
- Use the 2.5mm Hex Bit and Driver Handle to tighten the Screw/Peg.
- Ensure that the Screw/Peg does not protrude into the Distal Radius Ulnar Joint (DRUJ). The Buttress Screw/Peg does not require bi-cortical fixation.



Final Evaluation and Closure

- Evaluate the appropriate fixation and deployment of the Sonoma WRx implant in both A/P and Lateral radiographic views.
- Conclude the procedure by loosely approximating the first extensor retinaculum with absorbable suture and closing the incision.
- The physician may also elect to suture part of the 1st dorsal extensor retinaculum under the tendons to cover any protruding hardware.
- Apply appropriate cast or splint.



Post-Op Care

- Post-operative radiographs, casting or splinting are at the surgeon's discretion based upon the intra-operative assessment of fracture stability and anatomical reduction.
- Proper adherence to post-operative rehabilitation guidelines should be emphasized to the patient to ensure minimal pain and to allow for requisite healing.



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Dr. Mazur is a board certified orthopedic surgeon in private practice in Santa Rosa, CA. Dr. Mazur is a diplomat of the American Board of Orthopedic Surgery, a fellow of the AAOS and also a member of the ASSH.

Sonoma Orthopedic Products Inc., has made the following technique guidelines available, for informational purposes only and to illustrate the physician author's suggested treatment for an uncomplicated procedure. Proper surgical procedures and techniques are the responsibility of the surgeon, who must evaluate the appropriateness of the procedures described, based upon their own personal medical training, experience and the needs of the individual patient. Prior to the use of the Sonoma Orthopedic Products system, the surgeon should refer to the product instruction for use (IFU) for complete indications, warnings, precautions and contraindications. Package inserts are also available by contacting Sonoma Orthopedic Products, Inc.

SONOMATM WRx
WRIST FRACTURE REPAIR DEVICE

Surgical Technique Guide

SONOMATM
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