Achilles Tendon Repair
(with associated Haglund's Excision)

Surgical Protocol by
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It’s small. It’s strong. And it's all suture.

The JuggerKnot™ Soft Anchor represents the next generation of suture anchor technology. The 1.4mm deployable anchor design is a completely suture-based system, and is the first of its kind.

Suture Configuration
- Loaded with #1 MaxBraid™ Suture—leaves a lower knot profile vs. a #2 suture

Needles
- Tapered #5 needles can be used to tie down ligaments
Minimal Size
- Smaller drill guide is less invasive to surrounding tissue
- Smaller anchor diameter allows multiple anchors to be placed
- Reduces likelihood of intersecting anchors when placing multiple anchors

Soft Material
- Soft anchor deployment system—completely suture based implant
- Implant made from #5 polyester suture
- Eliminates the possibility of rigid material loose bodies in the joint

Reduced Bone Removal
- The volume of bone that is removed with a 3.0mm drill is equivalent to four JuggerKnot™ device drill holes
**Introduction**

Insertional tendinosis with enthesopathy is a common malady of the Achilles tendon, frequently associated with Haglund’s deformity of the calcaneus. Most patients respond well to the conservative measures recommended in the literature. A small percentage of patients will fail to improve and may become candidates for surgery. When the ossification of the tendon insertion and the Haglund’s deformity are of significant size, a major resection and reconstruction is indicated. The following technique is a simplified modification of the basic principles of this standard approach.

**PreOperative Preparation and Position**

Preoperatively, a standing lateral radiograph is essential to plan the extent of the resection and debridement. Our patients also commonly receive a popliteal block for postoperative analgesia. The patient is administered an anesthetic of choice in the supine position. A tourniquet is applied before the patient is repositioned. The patient is then turned into the prone position with a firmly padded support beneath the operative limb (Figure 1).

**Incision**

A vertical 8cm incision is placed along the medial border of the Achilles tendon extending distally to the glabrous skin margin then curved slightly laterally at the distal end (Figure 2).

**Dissection**

The subcutaneous layer is elevated from the Achilles paratenon. The paratenon is marked for later closure, incised and retracted. The ossification of the terminal Achilles fibers can usually be palpated. The medial and lateral borders of the tendon are defined and followed to their insertion where they are completely released from the calcaneus (Figure 3). The terminus of the tendon is then carefully debrided, removing all of the ossification fragments and any necrotic fibers often found on the anterior surface.
Next the tendon is retracted proximally to expose the Haglund’s deformity. The bony prominence is exposed subperiosteally and resected with a microsagittal saw, from the site of the fiber insertion to the dorsal cortex of the calcaneal tuberosity (Figures 4a & 4b). After the fragment is removed, the calcaneus is checked with a mini-C-Arm to confirm the adequacy of the resection.

The re-insertion site is determined by positioning the Achilles terminus onto the cut surface of the calcaneus with the foot in slight plantar flexion to restore correct plantar flexion tension and power. This site is marked and the Achilles retracted again. At the marked site, two JuggerKnot™ Soft Anchors will be placed about 5 to 8mm apart depending on the size of the patient’s calcaneal tuberosity.

Placement of the JuggerKnot™ Guide
To place the JuggerKnot™ Soft Anchors start by placing the JuggerKnot™ guide onto the resected calcaneus where the Achilles will be reattached (Figure 5).
Drill the Pilot Hole
Without moving the guide, insert the JuggerKnot™ drill bit into the power drill to the proximal laser-etch line to ensure appropriate depth as the collar of the drill contacts the back of the guide. Advance the drill until contact is made with the guide (Figures 6a & 6b).

Insert the Anchor
Remove the drill. Note: Caution must be taken to maintain precise guide position over the pilot hole during removal. While maintaining the guide position firmly against the bone, insert the JuggerKnot™ Soft Anchor through the guide and into the pilot hole. Lightly mallet to fully seat the anchor into bone (Figure 7).
Deploy the Anchor

Once the anchor has been fully seated (Figures 8a & 8b) into the calcaneus, lightly pull back on the anchor inserter handle to set the anchor (Figures 9a & 9b). Release the suture from the handle by unscrewing the luer-lock feature and remove the needles from the middle of the guide (Figure 10). Pull the anchor inserter handle directly back from the guide. Lightly pull on both sutures to set the anchor and verify the sutures slide (Figure 11).

Repeat these steps to place the second JuggerKnot™ Soft Anchor on the calcaneus (Figure 12).
**Surgical Technique**

**Repair the Achilles Tendon**
Using the tapered needles attached to the MaxBraid™ sutures on the implant, pass the needle from the deep to superficial surface of the tendon. With the foot plantar flexed, the sutures are tied over the tendon and the needles are cut from the sutures leaving the remaining sutures long. (Figure 13).

**Preparation of the 4.5mm ALLthread™ Knotless Suture Anchors**
To create a distal row for the Achilles make two pilot holes at the insertion point of the Achilles directly inferior to the JuggerKnot™ Soft Anchors, just over the edge of the cortical bone cut. To make the pilot holes in intermediate bone, use the ALLthread™ Knotless Punch and mallet it into the calcaneus to the step on the shaft of the device (Figures 14a & 14b). For hard bone use the punch and then follow with the 4.5mm ALLthread™ Knotless tap (Figure 15).
Next, use one of the passing cables exiting the 4.5mm Allthread™ Knotless Anchor and feed one suture from each JuggerKnot™ Soft Anchor through the wire and pull the passing cable to deliver the suture ends through the insertion handle. Pull the suture ends out of one side of the handle (Figures 16a & 16b).

Insert the ALLthread™ Knotless Suture Anchor into the first pilot hole while pulling the suture ends away from the inserter to facilitate control and maintain suture tension. Once the threads of the anchor have engaged the bone, release the sutures and firmly screw the anchor in until it is flush with bone. The inserter handle can be pulled out (Figure 17).
Follow these same steps to place the second ALLthread™ Knotless Suture Anchor. Next, take one limb of each suture and attach a Mayo Tapered #5 needle and pass it through the corner of the Achilles edge deep to superficial and tuck the edge against the bone by tying it to the remaining suture limb on the same side (Figure 18a). Repeat this step on the opposite corner of the repair. The repair is now complete (Figure 18b).

**Closure**

The paratenon is repaired and the subcutaneous and skin layers are re-approximated using the surgeon’s choice of closure. A light dressing is applied followed by a well-padded posterior splint with the foot in about 15 to 20 degrees of plantar flexion (Figure 19).

**Postoperative Care**

At one week, the dressing is changed and the wound is checked. A well padded cast is applied in slight plantar flexion. At 18 to 21 days, the sutures are removed and the cast changed. At 4 weeks, the cast is removed and a removable fracture brace is fitted with a small heel wedge. Progressive weight-bearing is encouraged. Physical therapy is started at 4–6 weeks. At 6–8 weeks, the patient resumes normal shoe wear with a small heel wedge which is discontinued at 8–10 weeks.
### Ordering Information

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<tr>
<th>Product Description</th>
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<td>1.4mm Single Loaded</td>
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<td><strong>JuggerKnot™ Short 1.4mm Drill Bit</strong></td>
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