



Trabecular Metal™ Osteonecrosis Intervention Implant - Removal Instruments

Surgical Technique



Continuum of Care Options for Osteonecrosis Patients

Introduction

The *Trabecular Metal* Osteonecrosis Intervention Implant (TMONII) is designed to help delay the need for total hip arthroplasty in patients suffering from stage 1 or 2 osteonecrosis of the femoral head. Since osteonecrosis is a progressive disease, removal of this device and conversion to a total hip arthroplasty may be necessary.

This surgical technique describes removal of the TMONII for conversion to a total hip arthroplasty. This is usually required as a result of collapse from the progression of the osteonecrosis. An alternative removal technique that does not require a total hip arthroplasty is also provided.

Preoperative Planning

Following discovery of collapse, determine the course of action to be taken with the patient. Plan the revision surgery and, where possible, template to determine the appropriate arthroplasty device to be implanted into the patient.

Contact your Zimmer representative to place a requisition for the *Trabecular Metal* Osteonecrosis Intervention Implant Removal Instruments, implants and instruments needed for the total hip arthroplasty procedure and if desired, bone void fillers. A mallet is also required for the procedure, which is not included in the removal instrument set.

Surgical Procedure

Step 1 – Patient Positioning and Incision

The patient should be positioned for a total hip arthroplasty procedure. Make an incision similar to the one used for the planned total hip arthroplasty. A slightly larger than normal incision may be required based upon surgical technique.

Step 2 – Femoral Neck Preparation

Dislocate the femoral head. Using the cut guide from the hip arthroplasty system, begin cutting through the femoral neck with either a reciprocating or oscillating saw. Cut around the implant as much as possible. The posterior portion of the bone can be cut later if necessary.



Fig. 1

Note: Do not cut through the implant with the saw as this will generate large amounts of *Trabecular Metal* debris.

Step 3 – Implant Cleavage

Place the tapered end of the osteotome against the implant through the cut in the anterior portion of the femoral neck. Using the mallet, strike the osteotome 4 to 5 times with moderate force. This should either cleave the rod or at least weaken it. If the rod does not cleave, lever the osteotome toward the femoral head, which should cleave the rod where it was struck with the osteotome.

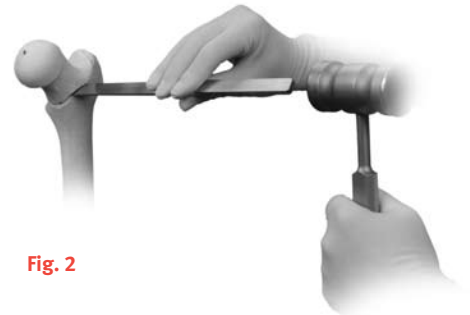


Fig. 2

Following cleavage of the rod, use the saw to finalize the femoral neck cut. Dissect appropriately so that the femoral head can be safely removed from the body.

The portion of the rod in the femoral head can be left in place or removed if desired using the instruments in the set. Any visible *Trabecular Metal* debris should now be removed.

Step 4 – Rod Exposure and Alignment

Use the bone gouge to expose the end of the rod in the femoral neck. This can be done by impacting the gouge around the implant. It is important to expose the complete circumference of the implant to a depth of 10mm to avoid cutting into the rod and leaving *Trabecular Metal* debris in the patient.



Fig. 3



Fig. 4

Assemble the 2 piece handle to the Punch Body. Align the Punch coaxially with the shaft of the implant. Using the mallet, tap on the top of the Punch so that it begins to cut the bone around the implant. Take care to ensure that the Punch is not cutting into the implant. Continue to impact and

rotate the punch around the implant until it contacts the larger diameter, threaded portion of the implant. This is indicated by an increase in resistance as the Punch is advanced through the bone and into the *Trabecular Metal* material. Alternatively, the final punch location can be visualized using C-arm fluoroscopy.



Fig. 5

Step 5 – Core Out the Implant

Disassemble the 2 piece handle from the Punch Body. If necessary, the Punch Body can be removed from the bone now and replaced after the handle is disassembled.



Fig. 6

Assemble the T-Handle to the Coring Tube. Slide the Coring Tube over the Punch Body.



Fig. 7

Manually drive the Coring Tube over the remaining length of the implant, twisting it as you drive it through the bone. This action should be repeated until the implant is completely free from the bone. The lateral cortex of the femur may need to be perforated to accomplish this.



Fig. 8

The depth of the Coring Tube can be visualized using C-arm fluoroscopy. If not contained within the Coring Tube, the implant should be withdrawn medially and discarded after removal.

The Coring Tube is a single use device and should be disposed of following the surgery. The Punch Body may be contained within the Coring Tube and should be removed from the Coring Tube before disposal.

Note: The Coring Tube should NOT be used under power as it may bind with the Punch instrument.

Step 6 – Fill the Defect and Perform Total Hip Arthroplasty

The defect in the lateral portion of the bone should be filled using either autograft from the femoral head or another bone void material such as *CopiOs*® Bone Void Filler.

Proceed with implantation of the Total Hip Arthroplasty device followed by normal soft tissue closure. Postoperative care is the same as would be prescribed for a patient undergoing this total hip arthroplasty procedure.

Evidence of small quantities of *Trabecular Metal* debris in the lateral portion of the femur following the procedure is of minimal concern.

Alternative Removal Techniques

Lateral Approach

If the patient is not being revised to a total hip arthroplasty, a lateral approach can be made through the same incision used to place the TMONII. Use the gouge to expose the circumference of the rod laterally to a depth of 10mm. Align the Coring Tube (assembled to the T-handle) coaxially with the implant. Use C-arm fluoroscopy to verify the alignment of the Coring Tube with the implant. Advance the Coring Tube over the entire length of the implant and remove the core of bone containing the implant. **If an increase in resistance is noticed, stop and verify that the instrument is properly aligned over the *Trabecular Metal* implant.** Fluoroscopy should be used intermittently to verify the tract of the Coring Tube as it advances over the implant.

Medial Approach

Following completion of Step 1 of the normal technique and dislocation of the femoral head, expose the tip of the implant in the femoral head using a rongeur (not included in set). Plastic sheeting (or another available material) can be cut and fashioned around the femoral neck to help capture any *Trabecular Metal* debris that may be inadvertently generated during the procedure. Use the gouge to expose the

circumference of the implant. Assemble the punch and align it with the implant. Using the mallet, advance the punch over the implant to the threads. Remove the handles from the punch and slide the coring tube over the punch. Advance the coring tube over the entire length of the implant to remove it from the bone. **If an increase in resistance is noticed while using either the punch of the coring tube, stop and verify that the instrument is properly aligned over the implant.**

Following either alternative technique, discard the implant and proceed with the chosen surgical procedure. Bone grafting should be performed to fill the void left by the implant removal as part of this procedure. Please contact your Zimmer representative for information about Zimmer bone void fillers.

Instrument Set Components (Set Number KT-1197-000-05)

00-1197-009-00	Coring Tube (Single Use)
00-1197-010-00	Punch
00-1197-011-00	Punch Handle A
00-1197-012-00	Punch Handle B
00-0298-002-00	Osteotome 1/2 Straight
00-2255-038-00	T-Handle
00-2884-000-01	Gouge 1/4 Straight
00-1197-020-00	Removal Instrument Case
00-5900-098-00	Removal Instrument Lid

Contact your Zimmer representative or visit us at www.zimmer.com