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<th>Spine</th>
<th>Sports Med</th>
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Surgical Technique

UNDERSTANDING TRADITION, MASTERING INNOVATION

MasterLoc

HIP SYSTEM

Medacta International
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1. INTRODUCTION

This document describes the Surgical Technique for the MasterLoc Hip System femoral stem.

The MasterLoc femoral stem is cementless, flat and double tapered, designed to accurately restore the patient’s biomechanics with minimal bone removal. For details regarding implantation using the AMIS approach, please see the dedicated AMIS Surgical Technique.

Please read the instructions for use thoroughly and, should you have any questions concerning product compatibility, contact your Medacta representative.

**CAUTION**
Federal law (USA) restricts this device to sale distribution and use by or on the order of a physician.

1.1 INDICATIONS OF USE

The MasterLoc stem is designed for use in total or partial hip arthroplasty to provide increased patient mobility and reduce pain by replacing the damaged hip joint, in primary or revision surgery.

Total hip arthroplasty is indicated in the following cases:
- Severely painful and/or disabled joint as a result of arthrosis, traumatic arthritis, rheumatoid polyarthritis or congenital hip dysplasia
- Avascular necrosis of the femoral head
- Acute traumatic fracture of the femoral head or neck
- Failure of previous hip surgery: joint reconstruction, internal fixation, arthrodesis, partial hip arthroplasty, hip resurfacing replacement or total hip arthroplasty

Partial hip arthroplasty is indicated in the following cases:
- Acute traumatic fracture of the femoral head or neck
- Non-union of femoral neck fracture
- Avascular necrosis of the femoral head
- Primary pathology involving the femoral head but with a non deformed acetabulum

1.2 CONTRAINDICATIONS

Total or partial hip arthroplasty is contraindicated in the following cases:
- Acute, systemic or chronic infection
- Skeletal immaturity
- Severe muscular, neurological, or vascular deficiency, or other pathologies of the affected limb that may compromise the functionality of the implant
- Bone condition that may compromise the stability of the implant

Mental or neuromuscular disorders may create an unacceptable risk to the patient and can be a source of postoperative complications.

It is the surgeon’s responsibility to ensure that the patient has no known allergy to the materials used.

1.3 PREOPERATIVE PLANNING

Careful preoperative planning is essential. It will help the surgeon to plan for the appropriate implant size in order to recreate as closely as possible the patient’s joint biomechanics.

In addition, using the set of X-ray templates to the scale of 1.15:1 (with an X-ray of the same magnification), it will be possible to determine:
- The implant size
- Appropriate femoral head centre
- The level of the neck resection

The MasterLoc Hip System was designed with the goal of maximizing implant fit in the proximal femur. Additionally, the distal geometry of the implant has been reduced compared to traditional flat, tapered wedge implants, enhancing the fit of the implant in the metaphysis while also accommodating those patients who present with Dorr Type A femoral canals.

**WARNING**

The final implant will be selected intra-operatively, because of possible discrepancies between actual conditions and templating.

1.4 SURGICAL APPROACH

The choice of surgical approach is up to the surgeon. The instrumentation has been developed for a conventional approach. Specific instrumentation for the anterior approach is available upon request (for further information see the AMIS dedicated surgical technique).
2. FEMORAL NECK OSTEOTOMY

The level of the neck cut is determined during preoperative planning using the X-ray templates.

The femoral neck osteotomy should be planned in accordance with the anatomy of the patient. The suggested resection angle for this implant is 45° to the diaphyseal axis of the femur. The resection is performed with an oscillating saw, taking care to maintain the planned neck resection.

The femoral head is removed using an extractor.
3. FEMORAL PREPARATION

To gain access to the medullary canal, the thigh is held in the position that provides the best exposure of the diaphyseal axis, depending on the selected approach.

To avoid undersizing and varus positions of the stem, a box chisel should be applied to the opposite side of the digital fossa of the femoral neck.

Guide the chisel with the appropriate anteversion: this step is essential for the correct application of the broach and implant.

This removes a block of cancellous bone.

**TIP**

The following surgical tips may minimize the risk of putting the stem into varus position:

- To ensure the stem is placed fully lateral within the femur, make sure that the axis of the stem is aligned with the femoral axis. If necessary, remove some bone from the proximal-lateral part before fully inserting the broach to allow it to find a proper alignment.

- In case a lateral ridge of cortical-like bone is present on the lateral edge of the resected femoral neck, remove it. A curette or a rongeur may be of assistance.

To prepare the femur, the canal can be opened by utilizing the canal finder. For the AMIS approach, a curved starter rasp is available (the AMIS slim starter), for the other approaches there is a straight canal finder.

**NOTICE:** Use the small calcar reamer for broach sizes 1 to 6. Use the large calcar reamer for broach sizes 7 to 14.
4. TRIALING

Fit the trial neck to the broach. To lock the trial neck to the broach, press onto the peg; to unlock, pull the neck.

Trial necks have a pin.

The trial neck is correctly coupled to the broach only when the pin is inserted into the dedicated broach housing. A clicking sound indicates that the trial neck has been correctly assembled on the broach.

NOTICE: If the trial neck is not sitting well on the broach, it might be due to some lateral bone that has not been removed. Once this bone is removed, the trial neck should seat properly.

Different trial necks are available for different broach sizes.

NOTICE: For easier identification the STD trial necks are yellow, the LAT trial necks are blue and the LAT Plus trial necks are green:

Before trialing the component, ensure the correct trial neck for the selected broach is used.

CAUTION

Depending on the size of the broach, the trial neck may not be in line with the proximal surface of the broach. The height of the trial neck is defined when the distal surface of the trial neck’s pin is in contact with the dedicated broach housing.

Trial heads of different diameters and sizes are available to perform the trial reductions.

A trial head is fitted to the trial neck by pushing it onto the taper.
**TIP**
To make head insertion easier, moisten it before insertion.

After placement of the trial or final acetabular component, trial reduction is performed using the head impactor.

**NOTICE:** The head impactor must be used only for head impaction and not for the correction of the acetabular shell position.

To remove a trial head, simply pull it.

**TIP**
Moisten the trial head/trial neck assembly. Twist and gently pull the trial head to extract it.

After checking and testing mobility, joint stability and lower limb length, remove the broach.
5. FINAL IMPLANTS

Insert the final prosthesis into place. The final prosthesis size corresponds to the size of the last broach.

**WARNING**
Take care not to damage the taper’s micro-thread when positioning the final implant.

The stem is inserted to the limit, corresponding to the trialing and matching the beginning of the coating.

Carefully perform the final impaction using a dedicated impactor.

**CAUTION**
Under no circumstances should the implant anteversion be changed at this stage.

The stem taper must be thoroughly cleaned before fitting the prosthetic head.

Place the final head of the chosen size in position and secure it using the head impactor.

**WARNING**
Never strike the final femoral head directly with a metal mallet or hammer. Use only the plastic head impactor provided for this purpose.

**NOTICE:** For further details about ceramic femoral heads, please refer to the instructions for use for ceramic femoral heads.

**OPTION**
After impaction, if the final stem needs to be repositioned, a stem repositioner is available. This repositioner can be used with any hip approach, including the AMIS technique.

Assemble the stem repositioner by unscrewing the screw with the 3.5mm screwdriver to open the plastic clamps. Then, assemble it to the implanted stem until this is firmly seated between the plastic clamps and re-tighten the screw. The metal body should be positioned on the medial side of the stem.
Depending on the selected approach, screw the threaded stem extractor M8 onto the stem repositioner (30° hole is suggested for the AMIS approach). Pull out the stem.
6. INSTRUMENT DETAILS

To assemble the MasterLoc broach onto its broach handle follow the instructions given below. These instructions are valid for the following broach handles:

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<th>DESCRIPTION</th>
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<td>Pincer broach handle</td>
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<tr>
<td>01.39.10.0024</td>
<td>Straight pincer broach handle</td>
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<tr>
<td>01.10.10.198</td>
<td>Offset 30° pincer broach handle RIGHT</td>
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<tr>
<td>01.10.10.199</td>
<td>Offset 30° pincer broach handle LEFT</td>
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</table>

6.1 BROACH ASSEMBLY

Assemble the broach by lifting up the lever as shown. The broach is correctly positioned into the triangular locking system when the circular mark on the broach matches the one on the broach handle.

Once assembled, lower the lever and check that it is fully seated down.

The broach is now assembled on the broach handle.

TIP

To extract the broach easily from the femoral canal, the surgeon should grip the handle in a way that allows the user to strike the corresponding anvil:
6.2 BROACH DISASSEMBLY
Remove the broach from the handle by lifting up the lever and pulling the broach.

Never strike on other parts of the handle, especially near the lever.

6.3 BROACH HANDLE ADJUSTMENT (ONLY WHEN STRICTLY NECESSARY)
The MasterLoc broach handle grip can be adjusted.
In order to do so, use the 3.5 mm screwdriver (reference 1.113) present in the MasterLoc ancillary set, and follow the instructions below:
• Hold down the button (Fig.20)
• While holding the button down, insert the screwdriver in the set screw (Fig.21):
  To increase the handle grip: turn clockwise and the sliding pin will move in the broach’s direction.
  To decrease the handle’s grip: turn counterclockwise and the sliding pin will move in the anvil’s direction.

**NOTICE:** The set screw is quite sensitive, therefore do not turn more than 45° at a time.

**WARNING**
The sliding pin is initially set in a position with a good compromise between functionality and grip. The closer the pin is to the broach the more grip it will have. An excessive grip may damage the broach handle.

After setting the MasterLoc broach handle, assemble it with a broach and check its stability in all directions. The broach should be stable inside the broach handle.
6.4 POSTERIOR PINCER BROACH HANDLE

Another broach handle option was developed specifically for posterior approach. The reference for this posterior pincer broach handle is 01.10.10.189.

7. IMPLANT NOMENCLATURE

MASTERLOC HIP SYSTEM

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\(^\d\) On demand
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* On demand

**NOTE:** Not compatible with MasterLoc LAT Plus

### MECTACER BIOLOX OPTION SYSTEM

#### HEAD DIAMETER (mm) REFERENCE

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* Specific for revision cases
NOTE FOR STERILIZATION

The instrumentation is not sterile upon delivery. Instruments must be cleaned before use and sterilized in an autoclave respecting the US regulations, directives where applicable, and following the manufactures instructions for use of the autoclave. For detailed instructions please refer to the document “Recommendations for cleaning decontamination and sterilisation of Medacta International orthopaedic devices” available at www.medacta.com.

Part numbers subject to change.