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Surgical Technique
Alloclassic Zweymüller Stem

Developed in conjunction with

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Alloclassic Zweymüller Stem

The Alloclassic Zweymüller stem is the original tapered stem with a rectangular cross section and has been implanted since 1979. Since its introduction, the Alloclassic Zweymüller has established high standards for total hip arthroplasty with his design features, the excellent clinical results, and a technically simple surgical technique.

Proven Classic
The long-term clinical success of the Alloclassic Zweymüller can be attributed to a unique combination of design features. A tapered stem geometry and a grit-blasted surface provide clinically proven initial and secondary fixation. In addition, the Alloclassic Zweymüller rectangular cross section has unparalleled rotational stability while the broaching technique allows for minimal disturbance to the endosteal blood supply and maximum bone conservation.

Different Offset Options – One Surgical Technique
For Alloclassic Zweymüller SL and SLO stems, the stem body below the resection line is identical, resulting in one rasp system that can be used for both stem groups. With the rasps and corresponding trial necks, trial reduction can be carried out for both offset options and femoral head lengths.

Indications
The versatile Alloclassic Zweymüller product portfolio provides the surgeon with a broad range of solutions, from trauma to revision surgery, all with one consistent design philosophy and a simple range of instruments.

The range of indications includes
- Osteoarthritis
- Avascular necrosis
- Rheumatoid arthritis
- Trauma
- Post-traumatic osteoarthritis
- Bone diseases like Morbus Paget or Morbus Gaucher
- Revision surgery

Extensive Sizing
Fourteen primary and eleven revision sizes allow optimum patient fit.

The revision Alloclassic Zweymüller SLL requires a separate set of rasps. The same surgical technique can be applied as for the primary implants.
**Preoperative Planning**

The implantation of the *Alloclassic* stem is generally straightforward and in most cases does not present problems. The practical instrument set simplifies the surgical manipulations and allows a well-targeted and efficient operating procedure. It is important that the preoperative planning is made with the necessary accuracy and that the individual steps of the operation are followed exactly.

Although x-ray quality differs from clinic to clinic and magnifications vary from patient to patient, a carefully planned hip prepares the surgeon for what lies ahead, thus minimizing intraoperative surprises.

Even in a case where the preoperative sketch would indicate the use of an implant two sizes smaller than what appears necessary during surgery, the preoperative planning would still have achieved its purpose: at least the possibility of a varus or valgus positioning of the component would have been clarified.

**The primary objectives of preoperative planning are to**

1. Determine preoperative leg length discrepancy.
2. Assess acetabular component size and placement.
3. Determine femoral component size, position and fit.
4. Assess the necessary femoral offset.

In addition, preoperative planning will assist in the identification of bone deformities and potential problems that might require special instrumentation during surgery. In the event that difficult bone conditions are present, it is recommended to have a c-arm ready in the operating theater in order to assess the situation intraoperatively.
Positioning for X-Rays
For the A/P x-ray of the pelvis, the femur should be internally rotated 15° to show an accurate view of the femoral neck length, metaphysis and diaphysis. A direct lateral x-ray may also be beneficial in determining implant sizing and antecurvature of the femur. The Alloclassic Zweymüller stem templates are available in different magnifications.
Templating the Femur

To determine any leg length discrepancy on the x-ray a line should be drawn across the bottom of the ischium (Fig. 2). The distance should then be measured from the lesser trochanter to the drawn reference line. The measured difference between the two measured sides is the radiographic leg length. As an alternate reference point, the tip of the greater trochanter to the drawn reference line may also be measured.

Select the femoral template size that will best fit the proximal and distal femur and equalize the leg length. The tapered geometry of the Alloclassic stem should fill the canal from the medial to the lateral cortical wall (Fig. 3). The femoral template should be in line with the long axis of the femur and in a neutral position. The proximal tip of the prosthesis and the tip of the greater trochanter are suitable reference points for determining the height of the final implant.
Surgical Technique

Osteotomy of the Femoral Neck
The osteotomy of the femoral neck is 1–2 cm above the lesser trochanter at an angle of 40–45° to the neutral axis of the femur or parallel to the intertrochanteric line. This may vary due to differences in the proximal femoral anatomy and should be based on preoperative planning (Fig. 4). The femoral head is then removed.

The leg is externally rotated to neutral in full extension to provide the best exposure for preparation of the acetabulum.

After the acetabular component has been placed, the leg is repositioned for optimal access to the femoral canal.

Preparation of the Femoral Canal
The femoral canal is opened dorsally by preparing the dorsal corticalis with a luer. This will ensure the correct axis within the femoral canal as well as prevent early calcar contact with the rasp and, ultimately, the prosthesis (Fig. 5).

Access to the femoral medullary cavity is obtained with a square box chisel. The chisel should be as lateral as possible against the transition area of the greater trochanter in order to create a slot to accommodate the prosthesis in a neutral position (Fig. 6).
The canal is then located and opened with the use of the small curette in 180° turns. Care must be taken to preserve as much bone as possible. Once the canal has been located, withdraw the curette in the same manner, with 180° turns (Fig. 7). The use of an awl is not recommended as the idea is to preserve bone stock while, at the same time, preventing a widening of the distal femur in order to avoid any compromise on the distal fixation of the prosthesis.

Caution should be used to ensure that a neutral opening to the canal is established and varus positioning is avoided.

For situations where there is a narrow femoral canal or cortical obstructions, the use of a tapered awl is recommended to locate the canal. The utilization of a c-arm is helpful in cases of anatomical deformity (e.g. severe postsurgical or congenital deformities of the proximal femur).

**Rasping Technique**

Prepare the femoral canal by first using rasp size 1, and progress to the next larger size rasp. Only in the case of very small femora should one start with the special size 01 and 0.

It is recommended to rasp the lateral region of the greater trochanter with the initial rasp as far lateral as necessary to allow for correct rasp placement in the femur and ultimately preventing a varus malaligned prosthesis (Fig. 8). The shaft of the slap hammer is aligned along the femoral axis, while the handle may be used as a reference for the antetorsion of the rasp (Fig. 9).
The insertion of the first rasp will determine the antetorsion of the subsequent rasps and the final implant. Hence, it is absolutely essential that the antetorsion of the rasp is controlled with the first rasp. An attempt to correct antetorsion after the first rasp may result in a deformity of the reamed bed, thus compromising the four-cornered wedge effect associated with the Alloclassic stem.

The rasping technique should progress to the desired, predetermined size by taking care to assess the antetorsion of the rasp. The correct alignment of the slap hammer should correspond with that of the femoral axis. To respect the antecurvature of the femur and to avoid varus positioning, it is essential to push the handle of the slap hammer medially and posteriorly during impaction.

To ensure proper rasp height and subsequent implant height, one calibration mark is located on the rasp adapter, which references the tip of the shoulder of the final implant (Fig. 10).

The first contact with the cortex usually occurs at the distal end of the rasp. Progress will become more difficult with each impaction, and the pitch of the impactor will change from low to high once cortical bone is engaged. The final rasp should be seated to the resection line and there should be no visible movement of the broach when the rasp adapter is rotated (placing the index finger between the calcar and the rasp helps to identify any movement of the rasp). The implant size will directly correspond to the final rasp size used. The area on the rasp where cortical remnants are found is valuable in determining if correct alignment was achieved.

At this point the hip is reduced to assess range of motion and joint stability.
**Trial Reduction**

Trial reduction of the *Alloclassic* may be accomplished with either the rasp or the trial prosthesis. Both methods will achieve the same results but require slightly different techniques. Each is described below and on the next page.

**Trialing directly off the rasp** is accomplished by removing the rasp handle and leaving the rasp in the femoral canal. A trial neck is inserted into the rasp hole.

*For Alloclassic Zweymüller SL and SLO different trial necks have to be used in order to correctly reproduce the different offset options (Fig. 11).*

Once the correct trial neck and the appropriate trial head are selected, the hip is reduced. Leg length and offset are checked. This procedure is repeated as necessary, using different length trial heads until optimal offset, leg length and stability are established. A trial reduction should not allow significant push-pull or “shuck” of the joint in full extension. Range of motion is checked to avoid bony impingement and instability.
Trialing with the trial prosthesis is accomplished by removing the final rasp. A trial prosthesis matching the size of the last rasp is inserted with the impactor on the proximal tip of the trial prosthesis (Fig. 12). Once the trial is firmly seated, the trial head size, as templated, is connected to the trial taper (Fig. 13). The hip is then reduced. Next, leg length and offset are checked. This procedure is repeated as necessary using different length trial heads until optimal offset, leg length and stability are established. A trial reduction should not allow significant push-pull or “shuck” of the joint in full extension. Range of motion is checked to avoid bony impingement and instability. The trial prosthesis is removed with the slap hammer and extractor hook, which is inserted into the proximal tip of the trial prosthesis (Fig. 14).
**Stem Implantation**

The stem is inserted and impacted with the impactor in contact with the proximal tip of the prosthesis. As with the rasp, the tone of the hammer blow will change once cortical bone is engaged (Fig. 15).

The taper protector is removed from the taper and a trial head may be applied for a final trial head reduction. Once the final range of motion and “shuck” tests are completed, the taper is carefully cleaned and dried. The selected femoral head is mounted with a rotational movement, and rotated further with axial force until it is firmly seated. The femoral head is seated with one light hammer blow on the head impactor in axial direction (Fig. 16).

Following final reduction, a thorough lavage of the wound is performed to remove bone chips and tissue debris.

Wound closure is carried out in accordance with the specific technique and approach used.
Postoperative Treatment

The postoperative treatment depends upon the patient and the bone quality and differs from one surgeon to another. Immediate weight bearing can be allowed in agreement with the orthopedic surgeon and mobilization may be started on the first postoperative day. Crutches should be used until the patient is able to avoid limping.
Alloc-classic® Zweymüller® Stem – Surgical Technique

Alloc-classic Zweymüller SL, SL HAC and SLO Stems

Alloc-classic® Zweymüller® SL stem

Protasul®-100
Taper 12/14
Uncemented

Alloc-classic® Zweymüller® SL HAC stem

Protasul®-100/HAC
Taper 12/14
Uncemented

Alloc-classic® Zweymüller® SLO stem

Protasul®-100
Taper 12/14
Uncemented

* Not available for commercial distribution in the U.S.
Instruments for Alloclassic Zweymüller SL, SL HAC and SLO Stems

**Tray with Rasp Handle with IMT Connection**

Tray for Alloclassic® Zweymüller® SL, SLO stem (complete)

*REF*
ZS01.00129.901

Tray base instruments Alloclassic® Zweymüller® SL, SLO (empty)

*REF*
01.00129.900

Tray insert instruments Alloclassic® Zweymüller® SL, SLO (empty)

*REF*
01.00129.901

Standard container cover grey

*REF*
01.00029.031

**Tray with Rasp Handle with Strike Plate**

Tray for Alloclassic® Zweymüller® SL, SLO stem (complete)

*REF*
ZS01.00129.902

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### Rasp handle with IMT connection

Ref: 01.00129.141

### Rasp handle with strike plate

Ref: 01.00129.140

### Long bar

Ref: 70.00.01

### Repositioning tops

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### Extractor hook

Ref: 5112

### All instruments

1 Included in REF ZS01.00129.901

2 Included in REF ZS01.00129.902
Upon Request

Handle long
REF 840.6021

Sliding hammer
REF 01.00129.190

Ball head impactor attachment
REF 78.00.38

Adapter with strike plate for extractor hook
REF 5684 or 8095

The following instruments can be used with the handle 75.11.00-02 or 840.6021:

Double offset rasp handle with strike plate
right REF 01.00129.142
left REF 01.00129.143

Modular impactor – plastic
REF 01.00129.662

Double offset rasp handle with IMT connection
right REF 01.00129.144
left REF 01.00129.145

Modular impactor – metal
REF 01.00129.663

Modular box chisel flat
REF 01.00129.661

Modular box chisel elongated, cutting edge
REF 01.00129.660

Can be used with:
• REF 01.00129.141
• REF 01.00129.144
• REF 01.00129.145

3 Can be used with:
### Trial stems Alloclassic Zweymüller SL

**Tray trial stems Alloclassic® Zweymüller® SL (complete)**
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**Tray trial stems Alloclassic® Zweymüller® SL (empty)**
- **REF:** 01.00129.502

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Instruments for Alloclassic Zweymüller SLL Revision Stem

Tray for Alloclassic Zweymüller SLL revision stem (complete)
   REF
   ZS 8000

Tray for Alloclassic Zweymüller SLL revision stem (empty)
   REF
   8003
Alloclassic® Zweymüller® SLL

**Detachable Rasp**

- **Size**
  - 1
  - 2
  - 3

**Trial Heads**

- **Size**
  - Ø 28 12/14 S
  - Ø 28 12/14 M
  - Ø 28 12/14 L
  - Ø 28 12/14 XL

**Extractor Hook**

- **Reference** 5112

**Sliding Hammer**

- **Reference** 01.00129.190

**Monobloc Box Chisel**

- **Reference** 5674

**Monobloc Impactor**

- **Reference** 5672

**Rasp Adapter with Lever**

- **Reference** 6835

**Alloclassic® Zweymüller® SLL Conebolt**

- **Size**
  - 1–12

- **Reference** 01.00129.504
### Upon Request

**Handle**
- Size: long 840.6021 or short 75.11.00-02

**Repositioning tops**
- Size: 28 mm 78.00.38-28, 32 mm 78.00.38-32, 36 mm 78.00.38-36

**Adapter with strike plate for extractor hook**
- REF 5684 or 8095

**Trial heads**
- SIZE 3 01.01559.136
- SIZE 4 01.01559.236
- SIZE 5 01.01559.336
- SIZE 6 01.01559.436

The following instruments can be used with the handle 75.11.00-02 or 840.6021:

- **Modular impactor – plastic**
  - REF 01.00129.662

- **Modular impactor – metal**
  - REF 01.00129.663

- **Modular box chisel flat**
  - REF 01.00129.661

- **Modular box chisel elongated, cutting edge**
  - REF 01.00129.660

### Trial stems Alloclassic Zweymüller SLL

**Tray trial stems Alloclassic® Zweymüller® SLL (complete)**
- REF ZS01.00129.612

**Tray trial stems Alloclassic® Zweymüller® SLL (empty)**
- REF 01.00129.612

**Standard container cover grey**
- REF 01.00029.031

**Trial stems Alloclassic® Zweymüller® SLL**

- **Size**
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