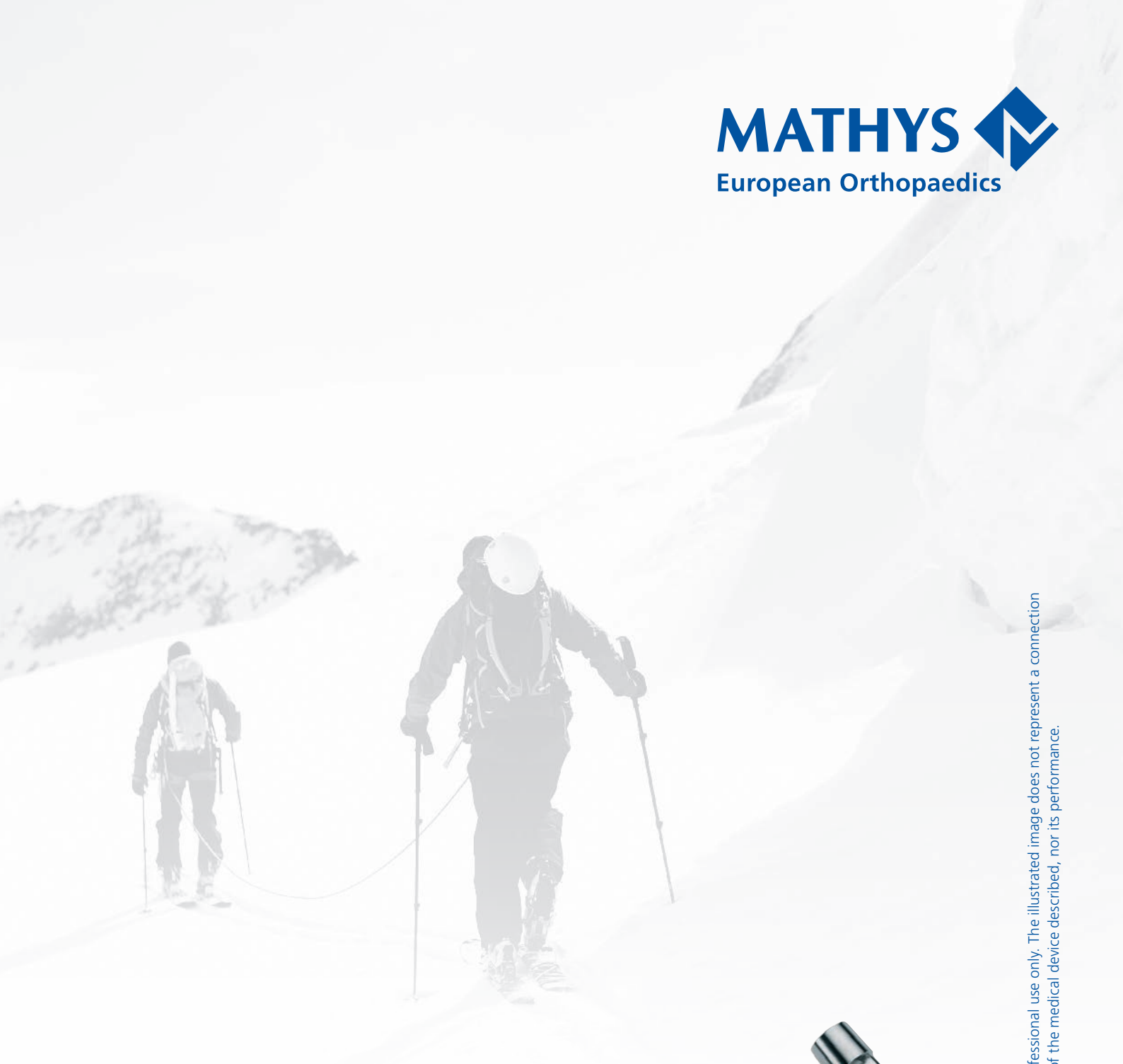
MATHYS
European Orthopaedics



Surgical technique

twinSys

Preservation in motion

Building on our heritage
Moving technology forward
Step by step with our clinical partners
Towards a goal of preserving mobility

***Preservation** in motion*

As a Swiss company, Mathys is committed to this guiding principle and pursues a product portfolio with the goal of further developing traditional philosophies with respect to materials or design in order to address existing clinical challenges. This is reflected in our imagery: traditional Swiss activities in conjunction with continuously evolving sporting equipment.

Contents

Remarks
Please make yourself familiar with the handling of the instruments, the product-related surgical technique and the warnings, the safety notes as well as the recommendations of the instruction leaflet before using an implant manufactured by Mathys Ltd Bettlach. Make use of the Mathys user training and proceed according to the recommended surgical technique.

Introduction

Today, implantation of artificial hip joints is one of the most successful standard procedures in surgery.[1] The aim of joint replacement is to eliminate pain and to restore the function and reconstruct the physiological anatomy of the hip joint. Due to the demographic development and the increasing importance of sports even in advanced age, the number of such operations can be expected to increase.[2]

Improving the quality of life of patients of any age has been among the central maxims of Mathys since 1963. Research in the field of implant materials and their improvement, optimisation of prosthetic designs and improvement in the handling of instruments enable Mathys to meet these requirements. We see our main task in coping successfully with this challenge. Mathys' many years of experience in these key areas of our activity are the basis for the success of our projects.

Philosophy
The twinSys system has been designed, in order to treat almost all prosthesis indications of the femoral hip joint. The portfolio of the twinSys system is based on a monobloc straight stem prosthesis, available as a cemented and a hydroxyapatite (HA)-coated uncemented version. The philosophy of the stem is originally based on the Müller straight stem philosophy and was further developed by a French author group.

Thanks to the triple tapered shape of the stem, shear forces are converted into compressive forces, thus lowering the risk of postoperative subsidence.[3, 4] The design of the stem and the chosen Ti6Al4V material enable a natural proximal force distribution in the bone through the previously compressed cancellous tissue. The twinSys Long is equivalent in the proximal area to the uncemented lateral version with an additional collar. In the distal part the stem is longer and slotted, which does offer the surgeon an option where he is uncertain about the fixation of the twinSys uncemented especially in cases of minimal loss of metaphyseal bone but an intact diaphysis.

The twinSys cemented is a monobloc straight stem prosthesis made from stainless steel (FeCrNiMnMoNbN). The twinSys cemented is offered in a standard and lateral versions. The stem is undersized by 1 mm per side compared with the rasp, providing sufficient room for an evenly distributed cement material. Thanks to the triple-tapered shape of the stem, shear forces are converted into compressive forces, enabling optimum wedging of the stem in the cement mantle. This minimises postoperative subsidence. The mirror-finished surface absorbs micro movements at the interface between the implant and the cement mantle and thus reduces the risk of loosening. Based on the French philosophy (French paradox) – having a highly polished stem in combination with a thin cement mantle – no centraliser is needed. Skinner et al.[5] could even prove that the cementing technique of a thin cement mantle is not worse and may produce better long-term results than the current teaching design of a thick cement mantle suggests. The rounded-off rectangular cross-section ensures stability of the stem in respect to the rotational forces acting on it.

The twinSys system has been used in hip arthroplasty (THA) since 2003.

1. Indications and contraindications

twinSys uncemented (standard, lateral and XS)

Indications
- Primary or secondary osteoarthritis of the hip
- Femoral head and femoral neck fractures
- Necrosis of the femoral head

Contraindications
- Presence of factors jeopardising stable anchoring of the implant:
  – Bone loss and/or bone defects
  – Insufficient bone substance
  – Medullary canal not suitable for the implant
- Presence of factors preventing osseointegration:
  – Irradiated bone (exception: preoperative irradiation for ossification prophylaxis)
  – Devascularisation
- Local and/or general infection
- Hypersensitivity to any of the materials used
- Severe soft tissue, nervous or vessel insufficiency that jeopardises the function and long-term stability of the implant
- Patients for whom a different type of reconstruction surgery or treatment is likely to be successful

twinSys uncemented (Long)

Indications
- Primary or secondary osteoarthritis of the hip
- Femoral head and femoral neck fractures
- Necrosis of the femoral head
- Revision surgery

Contraindications
- Presence of factors jeopardising stable anchoring of the implant:
  – Bone loss and/or bone defects
  – Insufficient bone substance
  – Medullary canal not suitable for the implant
- Presence of factors preventing osseointegration:
  – Irradiated bone (exception: preoperative irradiation for ossification prophylaxis)
  – Devascularisation
- Local and/or general infection
- Hypersensitivity to any of the materials used
- Severe soft tissue, nervous or vessel insufficiency that jeopardises the function and long-term stability of the implant
- Patients for whom a different type of reconstruction surgery or treatment is likely to be successful

twinSys cemented

Indications
- Primary or secondary osteoarthritis of the hip
- Femoral head and femoral neck fractures
- Necrosis of the femoral head

Contraindications
- Presence of factors jeopardising stable anchoring of the implant:
  – Bone loss and/or bone defects
  – Insufficient bone substance
  – Medullary canal not suitable for the implant
- Presence of factors preventing osseointegration:
  – Irradiated bone (exception: preoperative irradiation for ossification prophylaxis)
  – Devascularisation
- Local and/or general infection
- Hypersensitivity to any of the materials used
- Severe soft tissue, nervous or vessel insufficiency that jeopardises the function and long-term stability of the implant
- Patients for whom a different type of reconstruction surgery or treatment is likely to be successful

For further information, please refer to the instructions for use or ask your Mathys representative.

2. Preoperative planning

Preoperative templating can be performed on standard radiographs or with a digital planning system. The main goal is to plan the appropriate implant as well as its size and position, to restore the individual biomechanics of the hip joint. That way, potential problems can already be anticipated before surgery. In most cases, restoring hip biomechanics can be achieved by reconstructing the original hip rotation center, the leg length as well as the femoral and acetabular offset. [6]
It is recommended to document the preoperative planning in the patient's file.

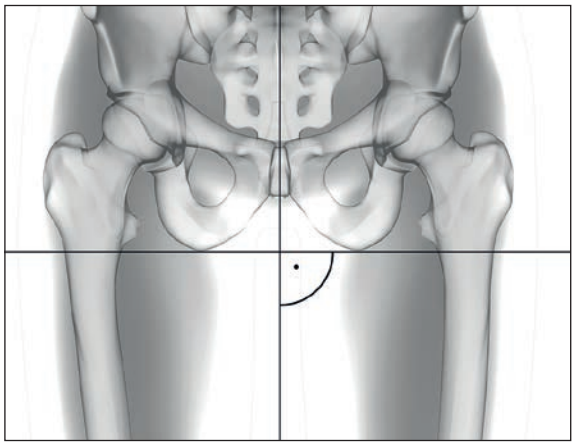


Fig. 1

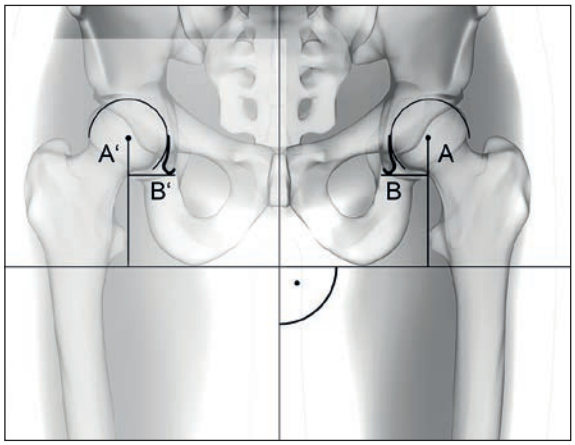


Fig. 2

Hip templating can best be performed on a pelvic radiograph taken in supine or standing position. The radiograph needs to be symmetrical, centered on the symphysis of the pubis and with both femora in about 20° of internal rotation. The magnification factor of the radiograph can be controlled with a calibration object or by using a fixed film-to-focus distance and positioning the patient at a fixed distance between film and X-ray source (Fig. 1).

Remarks
When the affected hip is severely damaged, templating on the unaffected side and transposing the planning to the affected side should be considered.

Estimation of the acetabular offset
The rotation center of the healthy (A) and affected hip (A') are defined as the center of a circle that fits the femoral head or the acetabular cavity.
A first horizontal line is drawn tangent to both ischial tuberosities and a second perpendicular line is plotted through the center of the symphysis of the pubis.

Remarks
In case of a leg length correction, the adjustment of the leg length can already be considered now using the ischial tuberosities as a reference.

The acetabular offset can be defined as the distance between Köhler's teardrop (B or B') and a vertical line through the hip rotation center (A or A') (Fig. 2).

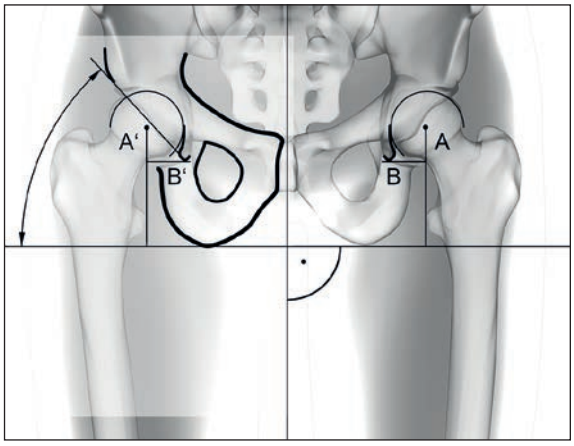


Fig. 3

Planning of the cup

The cup position in relation to the pelvis will take into account the acetabular contours, the hip rotation center, Köhler's teardrop and the required cup inclination angle (Fig. 3).

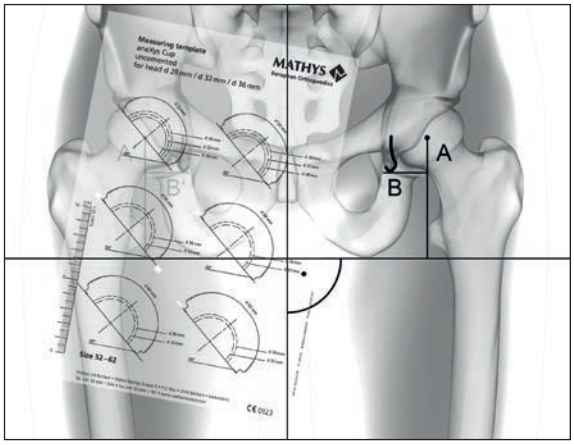


Fig. 4

To find an appropriate cup size, different cup templates are positioned at the level of the acetabular cavity aiming to restore the native hip rotation center while having sufficient bone contact, both at the level of the acetabular roof and Köhler's teardrop (Fig. 4).

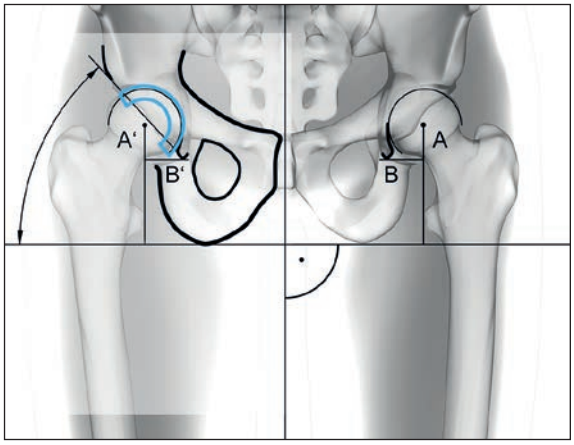


Fig. 5

The cup is positioned into the acetabulum aiming for an abduction angle of 40°. The implant position is established in relation to the anatomical landmarks (acetabular roof, Köhler's teardrop) and the implantation depth is marked down (Fig. 5).

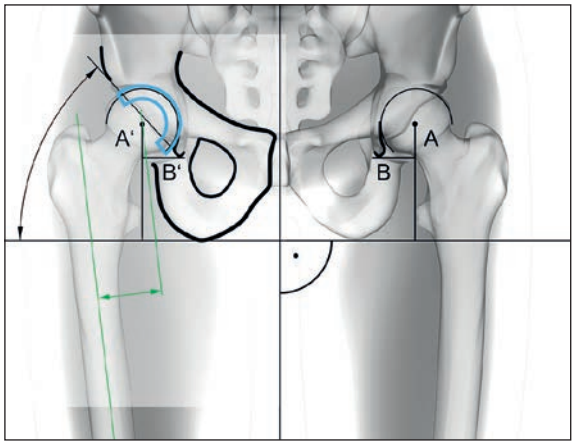


Fig. 6

Estimation of the femoral offset

The femoral offset is defined as the smallest distance between the central longitudinal axis of the femur and the hip rotation center (Fig. 6).

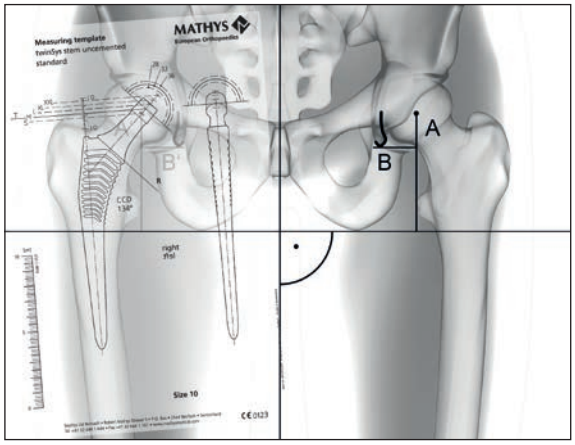


Fig. 7

Planning of the stem

Determination of the stem size using the measuring templates on the femur to be operated on. The template is to be aligned to the centre of rotation and the central axis (Fig. 7).

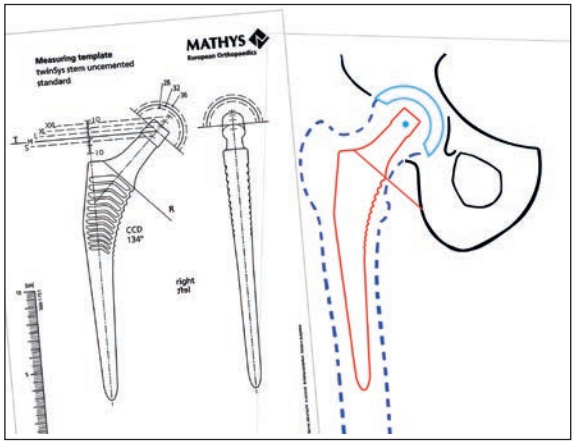


Fig. 8

On the planning sheet, the matching stem is delineated in the form of dotted lines with the measuring template in the same abduction/adduction position as the femur of the healthy side (Fig. 8).

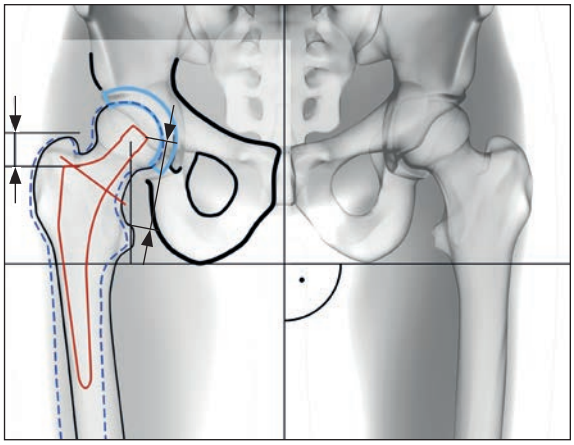


Fig. 9

The femur to be operated on is plotted over the selected stem.
The distance between the proximal end of the stem cone and the minor trochanter as well as the one between the stem shoulder and the major trochanter are measured.

Plotting of the resection plane and determination of the intersection between the trochanteric mass and the lateral demarcation of the prosthesis stem (Fig. 9).

3. Surgical technique

Different standardized conventional approaches to the hip joint have been established over many years in orthopaedics, depending on the cutting orientation and patient positioning. During the last years, a variety of minimally invasive techniques have been developed to approach the hip joint. For implantation of the twinSys system different surgical approaches are possible. The choice of the specific technique should be based on the individual experience and preferences of the operating surgeon.

Femoral osteotomy
The resection of the neck is done according to the preoperative planning. The neck is exposed using edgeless Hohmann handles. In case of a narrow anatomical situation it is recommended to perform the osteotomy of the neck in two steps. First step is to remove a discoidal bone segment. Afterwards, the head of the femur is removed using a head extractor. The preparation of the acetabulum and implantation of the shell is recommended prior implantation of the twinSys stem.

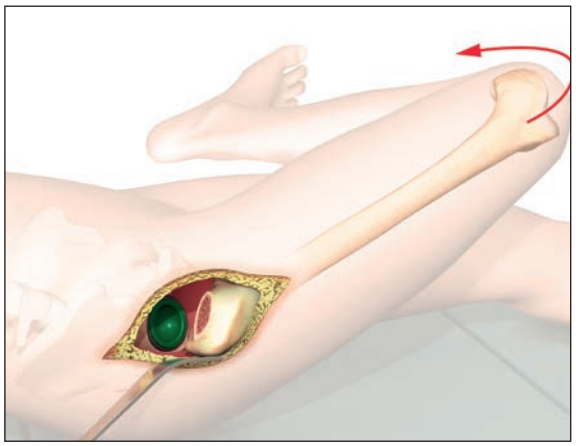


Fig. 10

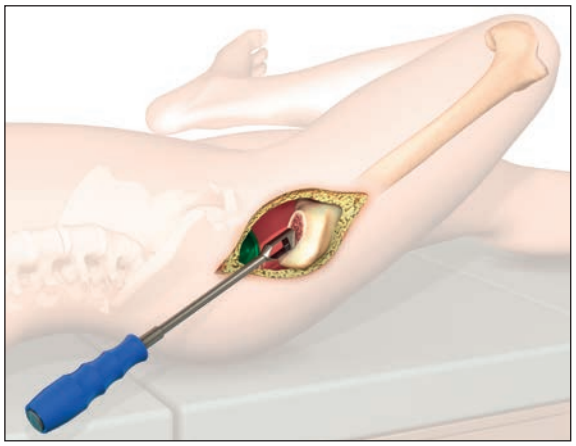


Fig. 11

Exposure of the acetabulum
Preparation of the acetabulum and implantation of the cup component.

To enable subsequent orthograde implantation of the twinSys system, sufficient lateral opening of the femoral canal is required (Fig. 10).

The provided box chisel (Fig. 11) should therefore be positioned laterally on the trochanteric fossa and hammered in cautiously in parallel to the dorsolateral femoral corticalis.

The desired future antetorsion of the stem of approx. 10° should already be anticipated at this point.

Since the spongiosa of the proximal femoral canal must not be removed completely but only anterior-posterior and medial-lateral in the proximal region, it is advisable to insert the box chisel only 1 – 2 cm proximally into the medullary cavity.

In case of doubt, a sharp spoon may be used to probe the inner lateral femoral corticalis. This reduces the risk of a possible varus or valgus position of the implant.

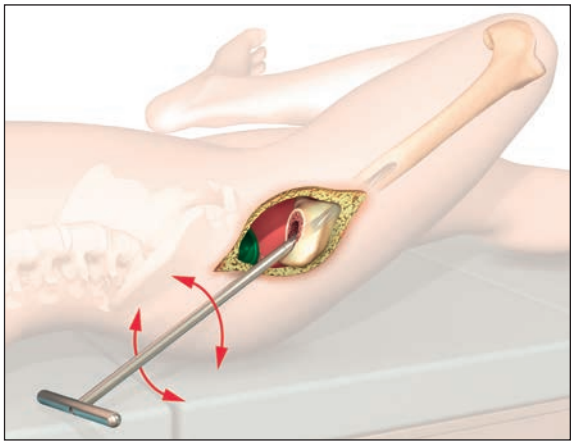


Fig. 12

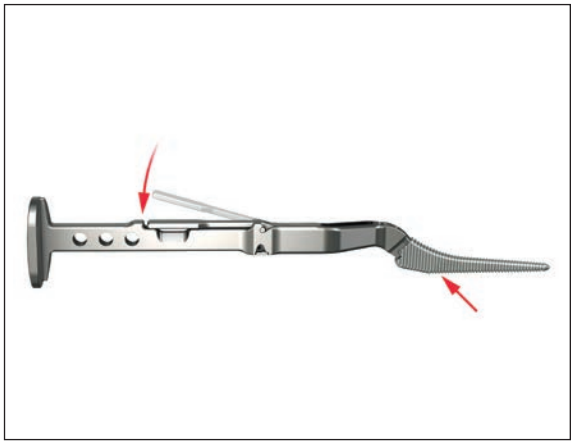


Fig. 13

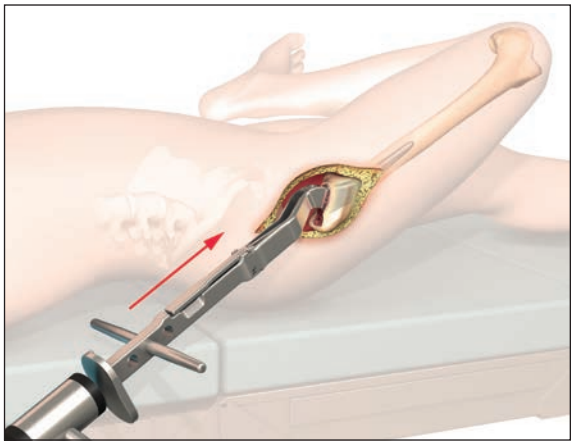


Fig. 14

Further opening with the reamer subsequently makes it easier to introduce and centre the rasps (Fig. 12).

It is essential to maintain the reamer in a central position inside the medullary cavity. Again, the lateral inner femoral corticalis serves as the guiding structure for orthogonal reaming.

The spongiosa must not be removed completely in the process.

When opening the medullary cavity with the box chisel and when introducing the reamer and the rasps make sure that the instruments are aligned with the axis of the femur. Feeling all around the medullary cavity with a blunt curette is recommended, in order to check the intramedullary situation.

This reduces the risk of a later varus or valgus position of the prosthesis.

Engaging and securing the smallest rasp on the rasp handle (Fig. 13).

With the rasp the femur is now progressively rasped out to match the structure of the stem. It is advisable to begin with the smallest rasp and then advance stepwise until the planned size is reached (Fig. 14).

The rasp are hammered in along the lateral corticalis with measured light strokes.

Remarks

The compaction broaching technique should enable a cancellous bone envelope to be achieved without cortical contact of the stem inside the femoral canal.

The patient's own anteversion must be respected.

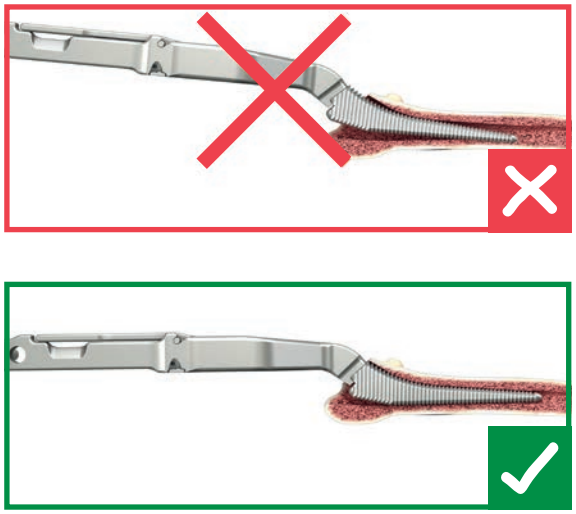


Fig. 15

When widening the medullary cavity in stages using increasing sizes of rasp, make sure the drive direction is in line with the axis of the femur (Fig. 15).

Each rasp should also be fully introduced to the level of the resection plane in order to prevent the potential protrusion of the final implant.

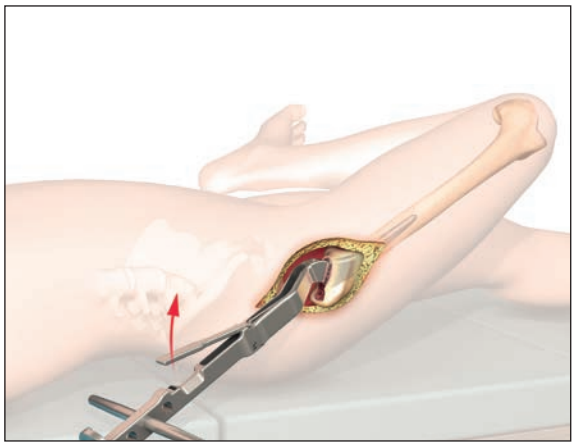


Fig. 16

Once the largest possible rasp is at the resection level of the femur, and cannot be inserted any further using moderately strong taps with the hammer, the connection to the rasp handle should be released (Fig. 16).

If the rasp implanted is smaller than that template stem size, the early locking of the rasp during femoral preparation could be attributable to:

1) *incorrect insertion axis, either in a varus/valgus or rotational direction,*
2) *a tulip-shaped femur, which may require distal diaphyseal reaming, or*
3) *high-density cancellous bone commonly found in young patients.*

A size larger than that template could be due to:

1) *the cancellous bone being of poor mechanical quality,*
2) *fracture, or*
3) *misalignment. The intraoperative results should be compared with the preoperative planning data.*

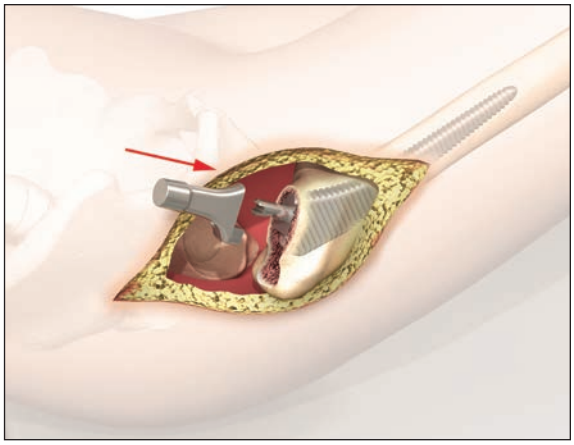


Fig. 17

The required trial cone (standard or lateral) is placed on the rasp and the selected trial head attached (Fig. 17).
It is recommended that the depth reached is checked with the preoperative reference measurements before trial repositioning.

Match the final head size with the inner diameter of the cup.

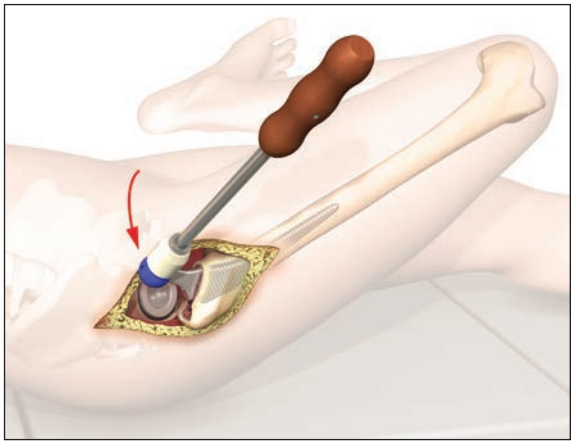


Fig. 18

Trial reduction of the stem (Fig. 18).

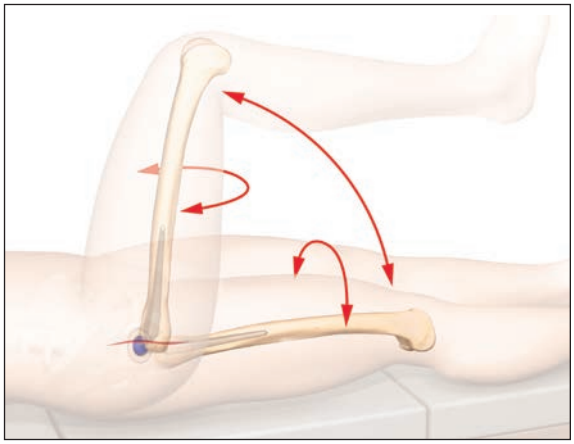


Fig. 19

After the femur has been reduced, the whole range of movement is checked. Special attention should be paid to the readiness of the joint to luxate during internal and external rotation movements in extension and flexion with even tension on the soft tissue (Fig. 19).

3.1 Implantation of a twinSys uncemented stem

After removing the rasp, avoid rinsing and drying the medullary cavity, in order to support the subsequent integration of the bone. The time between the rasp removal and implantation of the original uncemented stem should be as short as possible.

Remarks: *Prior to the removal of the rasp, rotational and axial stability should be reassessed. This is done by reattaching the rasp handle and trying to rotate the rasp. If there is any movement of the rasp, the next size of the rasp must be used.*

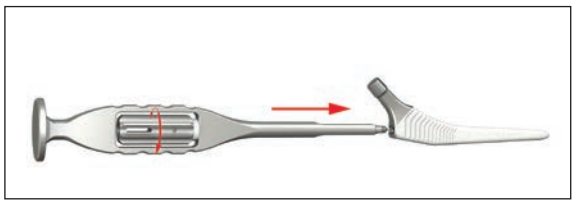


Fig. 20

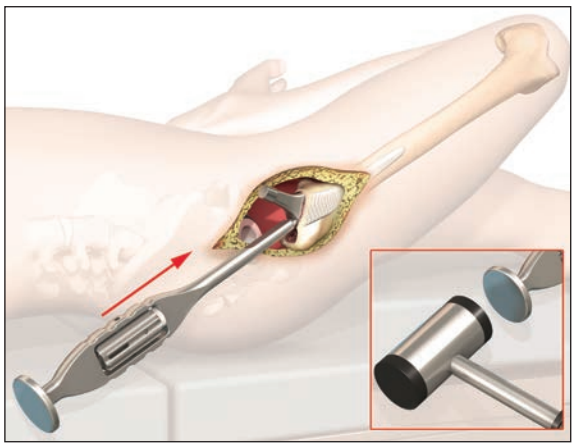


Fig. 21

The appropriate stem is screwed to the stem positioner with screw holder and anchored in the prepared implant bed (Fig. 20, 21).

Remarks

The stem positioner with screw holder may be used only for impacting the implant.

Optionally the impactor with offset or MIS stem impactor with ball can be used to implant the stem.

Remarks

The introduction should be easy until the stem stands proud 2 or 3 cm above the neck cut.

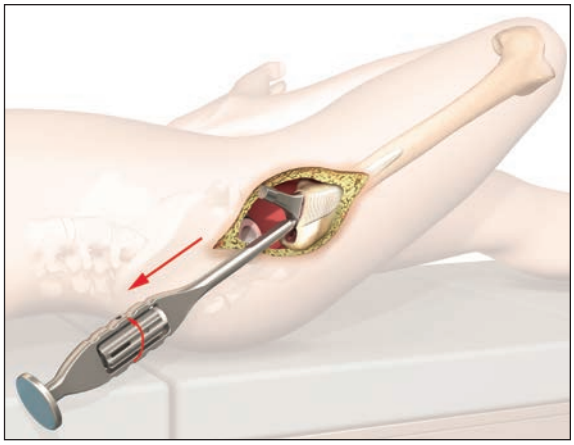


Fig. 22

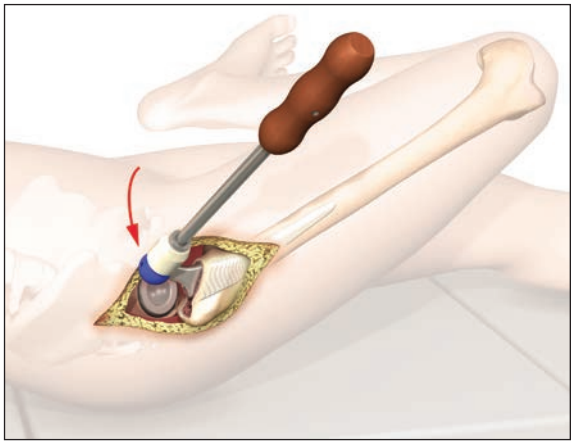


Fig. 23

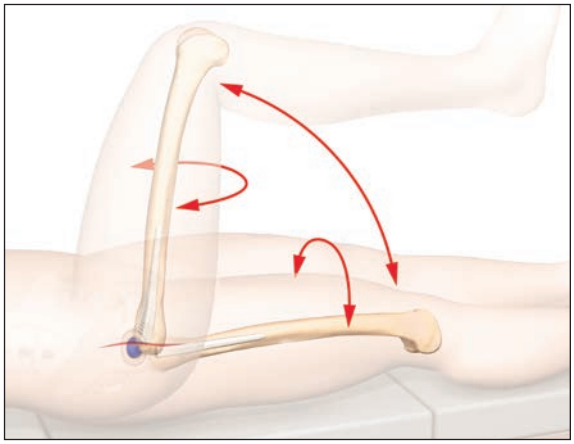


Fig. 24

As soon as the prepared depth has been reached, the stem is released from the stem positioner with screw holder by turning the screw wheel counter clockwise (Fig. 22).

If the stem implanted is smaller than that templated, the early locking of the rasp during femoral preparation could be attributable to: (1) incorrect insertion axis, either in a varus/valgus or rotational direction, (2) a tulip-shaped femur, which may require distal diaphyseal reaming, or (3) high-density cancellous bone commonly found in young patients.
A size larger than that template could be due to (1) the cancellous bone being of poor mechanical quality, (2) fracture, or (3) misalignment.

The intraoperative results should be compared with the preoperative planning data.

The design of the rasp, specifically optimised for anchoring the stem, corresponds to a great extent to the basic implant.
However, the coating of the stem does represent the pressfit of the stem, which is about 150 µm on each side. This requires an adequate distance to the cortical bone edge to allow inserting the stem to the planned depth.

Another trial reduction can be carried out with the appropriate trial head in order to check the range of movement and the ligament tension with the implant in place (Fig. 23, 24).

Match the final head size with the inner diameter of the cup.

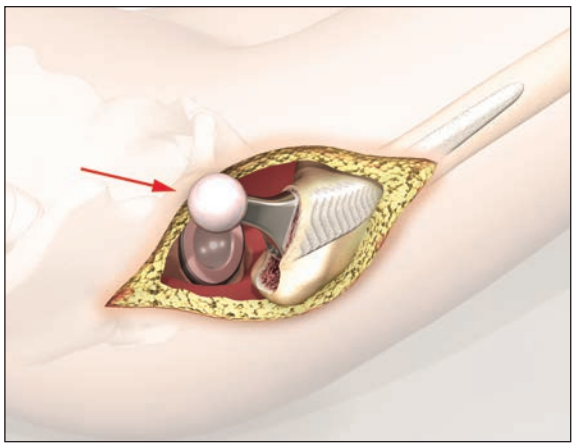


Fig. 25

The cone is then carefully cleaned and dried and the definitive prosthesis head carefully inserted, to avoid complications at the stem/head interface (Fig. 25).

Reducing the joint.

Rinsing the joint space in order to remove any free bone debris. Routine closure of the wound layer by layer depending on the approach used.

3.2 Implantation of a twinSys cemented stem

The surgical procedure for the cemented stem is identical as far as the trial reduction after the rasping process. **Until this point, the method of fixing and the appropriate prosthesis can still be selected during the operation.**

In contrast to the rasp, the dimensions of the cemented stem are 1 mm less on each side to allow for a homogenous cement mantle.

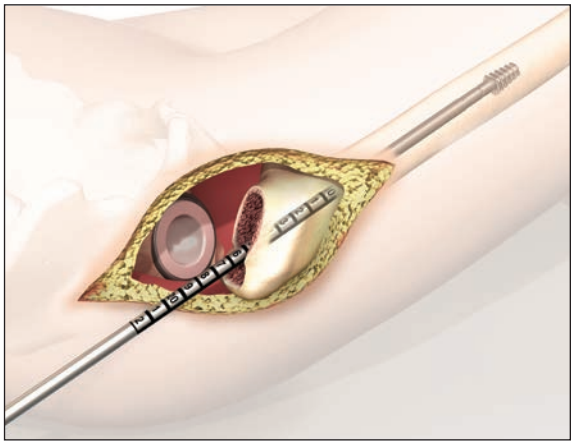


Fig. 26

The cement restrictor for the medullary canal may be made of autologous spongiosa, polyethylene or bioabsorbable synthetic material and is inserted 1 cm below the tip of the prosthesis (Fig. 26).

The instruments for determining the size of the cement restrictor for the medullary canal are not in the standard range of instruments and should be separately obtained.

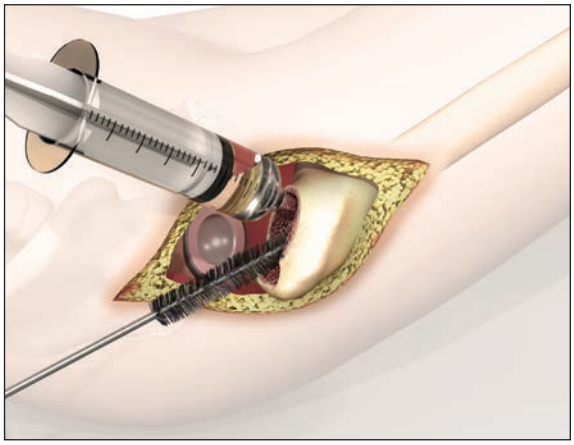


Fig. 27

Debridement of the medullary canal using manual cleaning with a curette or brush and extensive rinsing or Jet Lavage (Fig. 27).
The prosthesis bed is then carefully suctioned and dried. The bone cement is mixed in parallel to this.

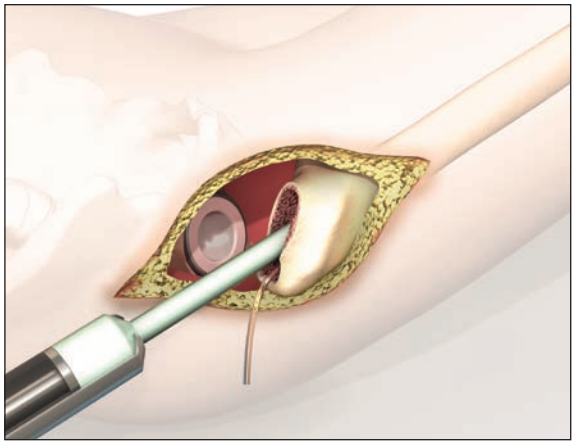


Fig. 28

Insertion of the ventilation tube and retrograde application of the mixed bone cement (Fig. 28).

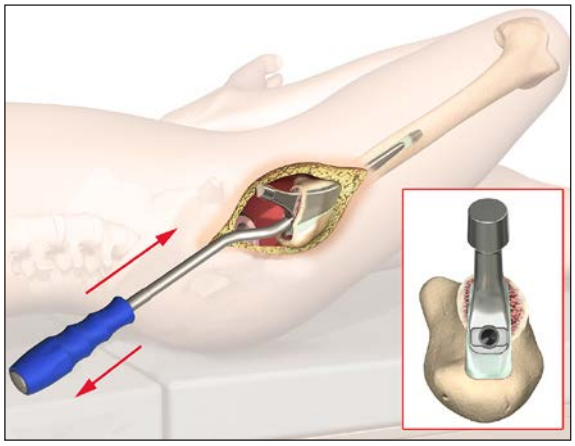


Fig. 29

The selected stem is slowly and steadily introduced as far as the defined end position. At the same time, the ventilation tube is carefully removed (Fig. 29).

The proximally displaced excess bone cement is completely removed. Until the bone cement has hardened fully, the cemented stem must be held in position. The cemented stem can then be released from the stem positioner with screw holder by turning the screw wheel anticlockwise.

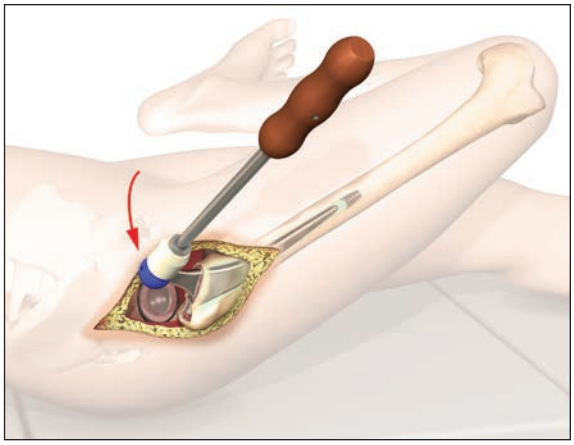


Fig. 30

Another trial reduction can be carried out with the appropriate trial head in order to check the range of movement and the ligament tension with the implant in place (Fig. 30, 31).

Match the final head size with the inner diameter of the cup.

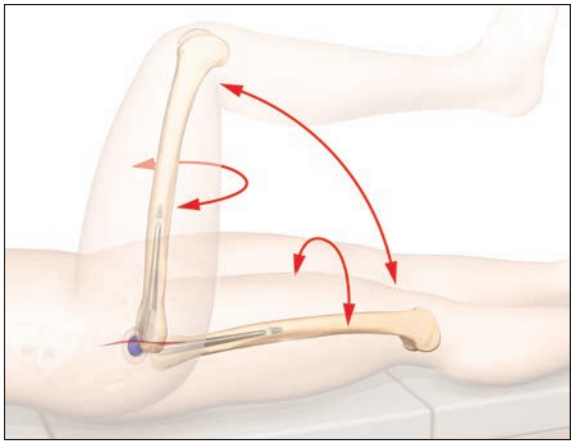


Fig. 31

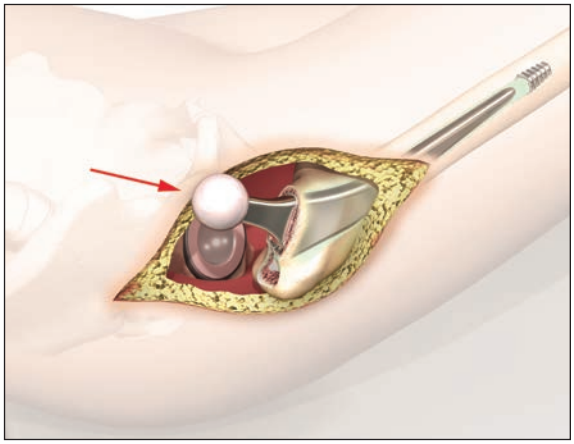


Fig. 32

The cone is then carefully cleaned and dried and the definitive prosthesis head carefully inserted, to avoid complications at the stem/head interface (Fig. 32).

Reducing the joint.

Rinsing the joint space in order to remove any free cement or bone debris. Routine closure of the wound layer by layer depending on the approach used.

3.3 Revision implantation with twinSys Long stem

This describes the surgical technique for revision implantation of a total hip prosthesis using the example of transgluteal approach. Other accesses are also possible.

In a relatively well-conserved bone bed, the exchange of the femoral component can be performed from proximal. Use either a ventral or a dorsal approach. A trochanteric osteotomy is not recommended, since it is relatively difficult to carry out a reliable internal trochanteric fixation with a revision stem.

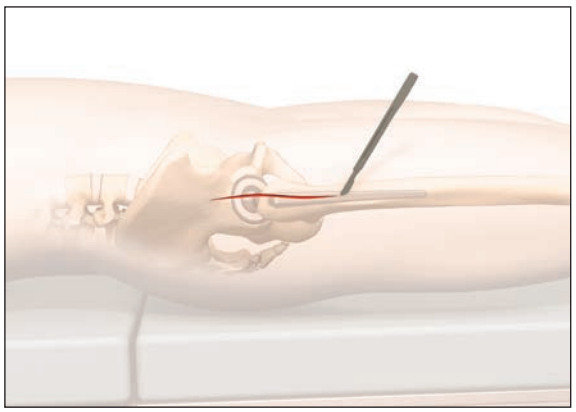


Fig. 33

Longitudinal lateral approach, after splitting of the iliotibial tract. Detach the ventral parts of the gluteus minimus subperiostally from the trochanter major. Expose the regenerated tissue of the scarred joint-capsule (Fig. 33).

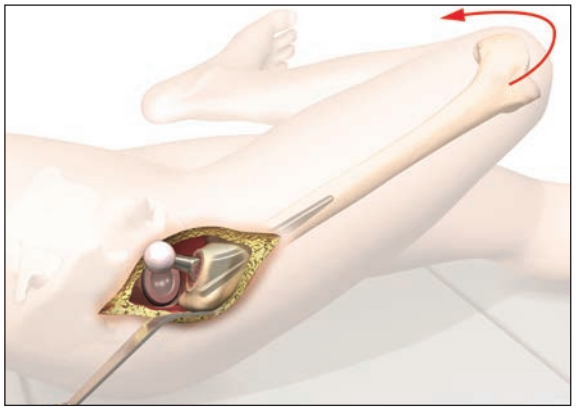


Fig. 34

After a broad fenestration of the joint capsule, dislocate the joint, freely prepare the prosthesis bed using a Luer gouge and chisel, especially in the trochanter major region, in order to prevent a fracture of the trochanter during removal of the prosthesis (Fig. 34, 35).

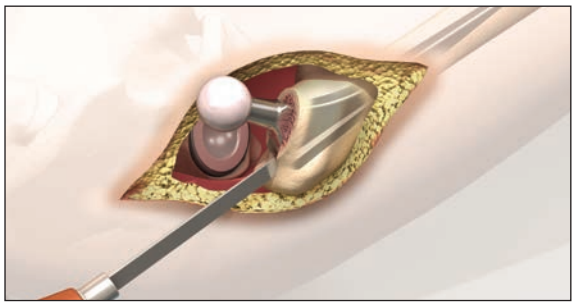


Fig. 35

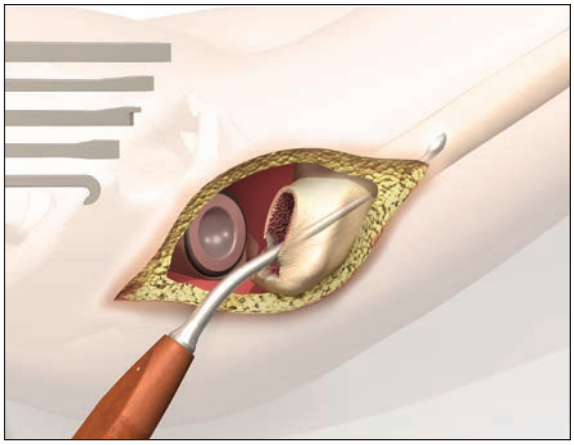


Fig. 36

Use special chisels and curettes to carefully remove any residual bone cement, connective and granulation tissue from the bone bed, then thoroughly rinse the bone bed (Fig. 36).

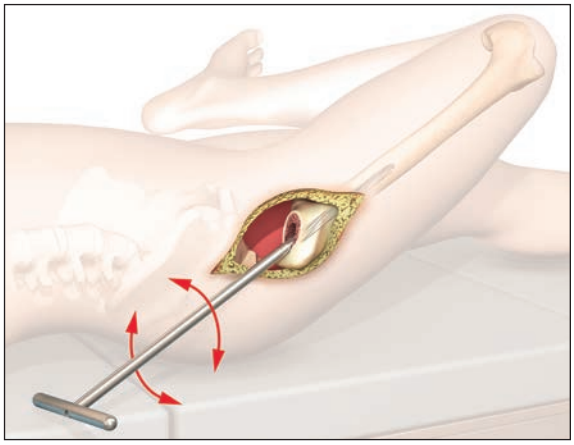


Fig. 37

Further opening with the reamer subsequently makes it easier to introduce and centre the rasp for twinSys Long stems (Fig. 37).

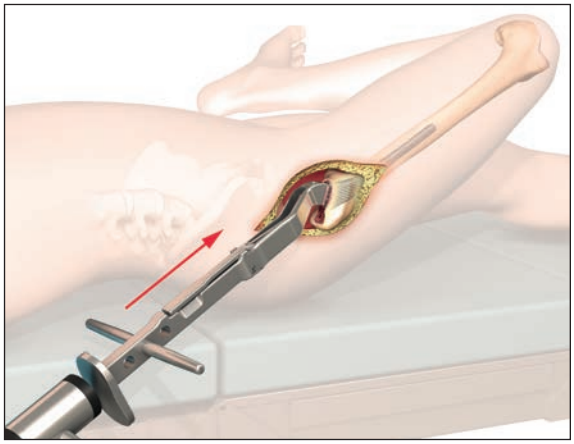


Fig. 38

Widen the medullary cavity in stages using increasing sizes of the rasp for twinSys Long stems* until the preoperatively planned size has been reached (Fig. 38).

Each rasp should be fully introduced as far as the level of the plane resection. Remove handle.

* Rasp sizes 12 – 15 are available for twinSys Long stems.

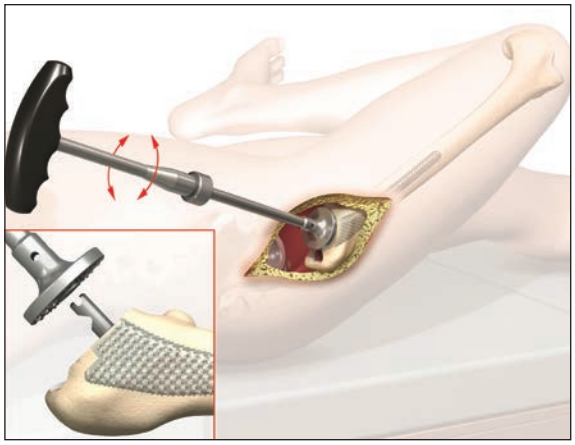


Fig. 39

Place the required calcar reamer onto the rasp for twinSys Long stems and carefully handrasp the calcar bone to a even level (Fig. 39).

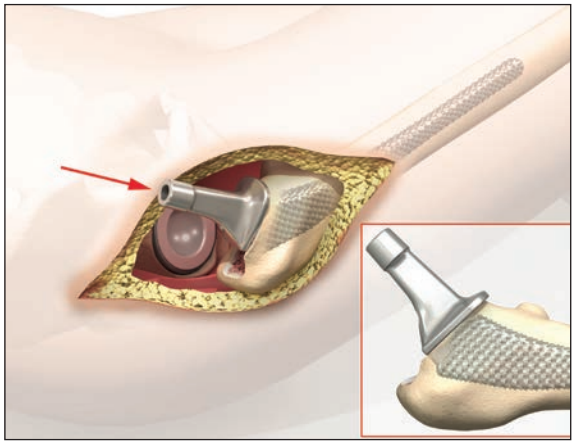


Fig. 40

The trial cone for twinSys Long stems is placed on the rasp for twinSys Long stems and the selected trial head attached. It is recommended that the depth reached is checked with the preoperative reference measurements before trial repositioning (Fig. 40).

Match the final head size with the inner diameter of the cup.

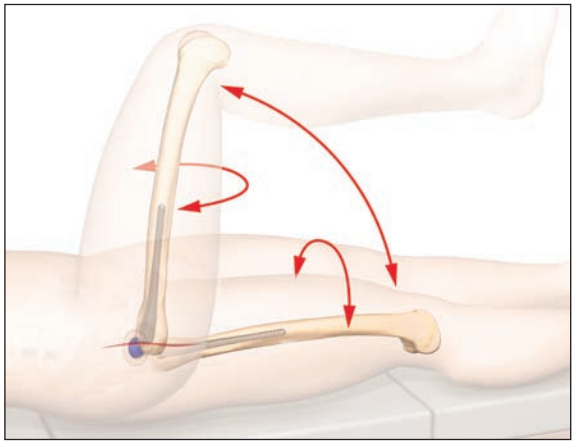


Fig. 41

After the femur has been reduced, the whole range of movement is checked. Special attention should be paid to the readiness of the joint to luxate during internal and external rotation movements in extension and flexion with even tension on the soft tissue (Fig. 41).

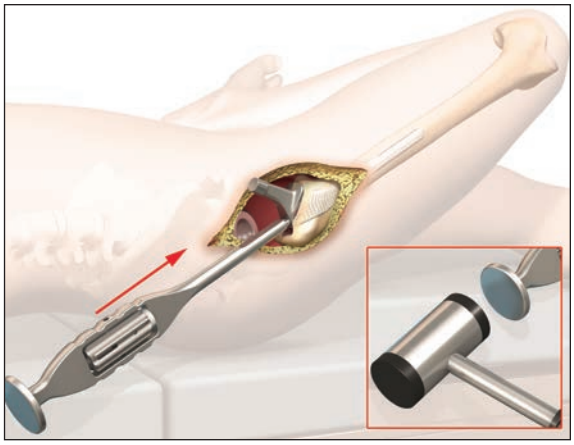


Fig. 42

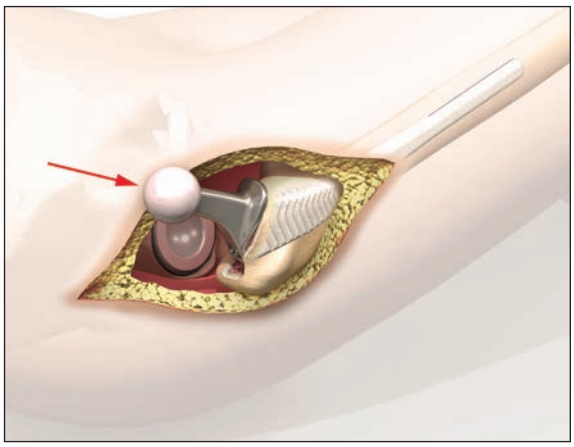


Fig. 43

The appropriate twinSys Long stem is screwed to the stem positioner with screw holder and anchored in the prepared implant bed (Fig. 42).

Remarks
The stem positioner with screw holder may be used only for impacting the implant.

Optionally the impactor with offset or MIS stem Impactor with ball can be used to implant the stem.

A further trial reduction can be carried out with the appropriate trial head in order to check the range of movement, the tendency to luxate and the ligament tension of the implanted prosthesis.

The cone is then carefully cleaned and dried and the definitive prosthesis head carefully inserted, to avoid complications at the stem/head interface (Fig. 43).

Reducing the joint.

Rinsing the joint space. Inserting a Redon drain. Reinsertion of the small gluteal muscles through the bone into the trochanter major using strong suture.

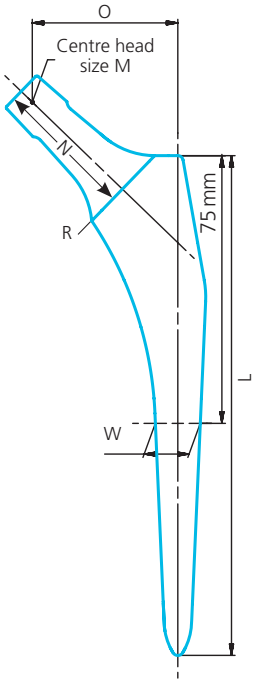
Closing the wound layer by layer.

4. Implants

4.1 Technical Data

Size	L = Length		W = Width		O = Offset		N = Neck length	
	uncem.	cem.	uncem.	cem.	standard	lateral	standard	lateral
7 XS	125	n/a	9.6	n/a	35.7		34.4	
8 XS	130	n/a	10.6	n/a	36.2		34.4	
9 XS	135	n/a	11.6	n/a	36.7		34.4	
10 XS	140	n/a	12.6	n/a	37.2		34.4	
11 XS	145	n/a	13.6	n/a	37.7		34.4	
12 XS	150	n/a	14.6	n/a	38.2		34.4	
7	125	n/a	9.6	n/a	39.3	45.1	39.4	43.6
8	130	n/a	10.6	n/a	39.8	45.6	39.4	43.6
9	135	134	11.6	9.8	40.3	46.1	39.4	43.6
10	140	139	12.6	10.8	40.8	46.6	39.4	43.6
11	145	144	13.6	11.8	41.3	47.1	39.4	43.6
12	150	149	14.6	12.8	41.8	47.6	39.4	43.6
13	155	154	15.6	13.8	42.3	48.1	39.4	43.6
14	160	159	16.6	14.8	42.8	48.6	39.4	43.6
15	165	164	17.6	15.8	43.3	49.2	39.4	43.6
16	170	169	18.6	16.8	43.8	49.6	39.4	43.6
17	175	n/a	19.6	n/a	44.2	50.0	39.4	43.6
18	180	n/a	20.6	n/a	44.7	50.5	39.4	43.6
12 Long	180	n/a	14.6	n/a	47.6		46.7	
13 Long	190	n/a	15.6	n/a	48.1		46.7	
14 Long	200	n/a	16.6	n/a	48.6		46.7	
15 Long	210	n/a	17.6	n/a	49.2		46.7	

All measurements in mm



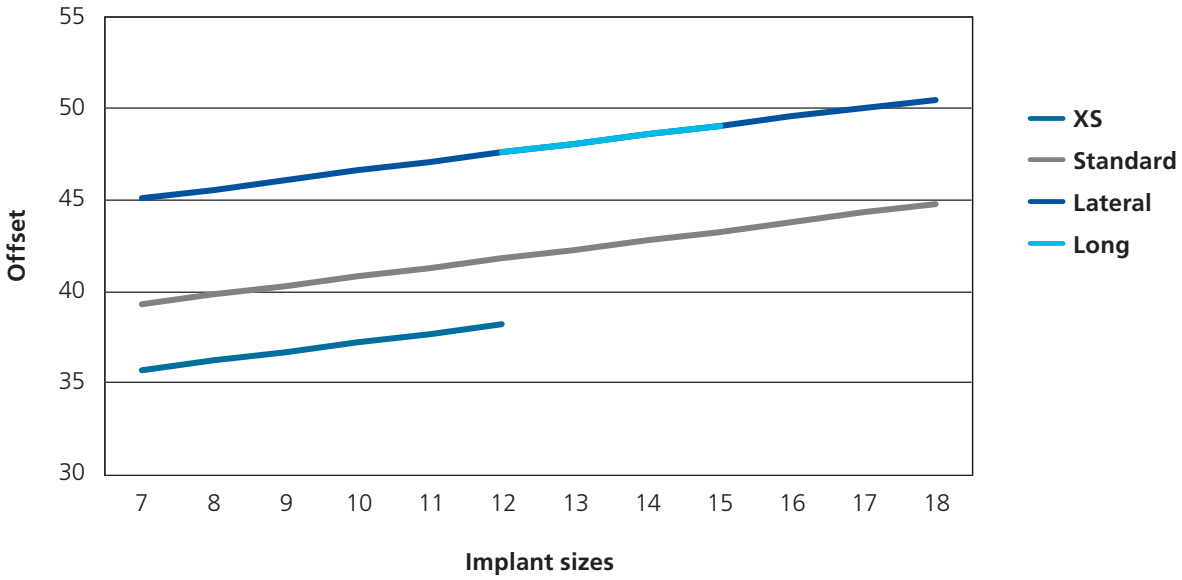
Glossary

O Offset
W Width
L Stem length
R Resection line
N Neck length

Offset

Dimension	7	8	9	10	11	12	13	14	15	16	17	18
Lateral	45.1	45.6	46.1	46.6	47.1	47.6	48.1	48.6	49.2	49.6	50	50.5
Standard	39.3	39.8	40.3	40.8	41.3	41.8	42.3	42.8	43.3	43.8	44.2	44.7
XS	35.7	36.2	36.7	37.2	37.7	38.2	–	–	–	–	–	–
Long	–	–	–	–	–	47.6	48.1	48.6	49.2	–	–	–

Offset design of the twinSys range

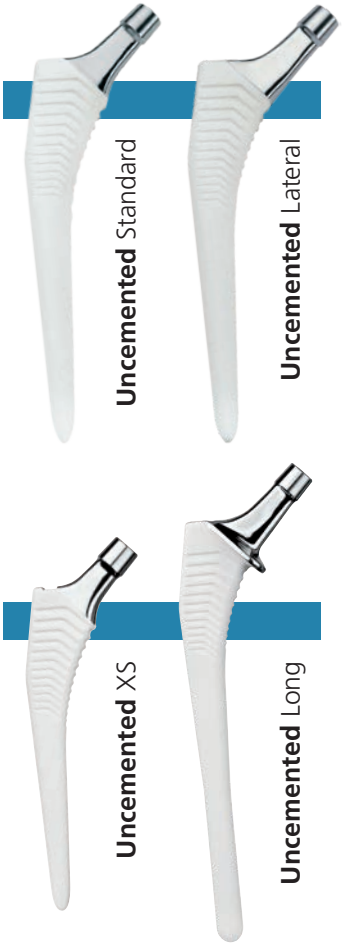


4.2 Implant list

twinSys uncemented stem

Size	Standard	Lateral	XS	Long
7	52.34.1157	52.34.1159	56.11.1068	–
8	52.34.1158	52.34.1160	56.11.1069	–
9	56.11.1000	56.11.1010	56.11.1070	–
10	56.11.1001	56.11.1011	56.11.1071	–
11	56.11.1002	56.11.1012	52.34.1161	
12	56.11.1003	56.11.1013	52.34.1162	56.11.3003
13	56.11.1004	56.11.1014	–	56.11.3004
14	56.11.1005	56.11.1015	–	56.11.3005
15	56.11.1006	56.11.1016	–	56.11.3006
16	56.11.1007	56.11.1017	–	–
17	56.11.1008	56.11.1018	–	–
18	56.11.1009	56.11.1019	–	–

Material: Ti6Al4V, Ca5 (OH) (PO4)3
Cone: 12/14 mm
CCD-angle: 134°



twinSys cemented stem

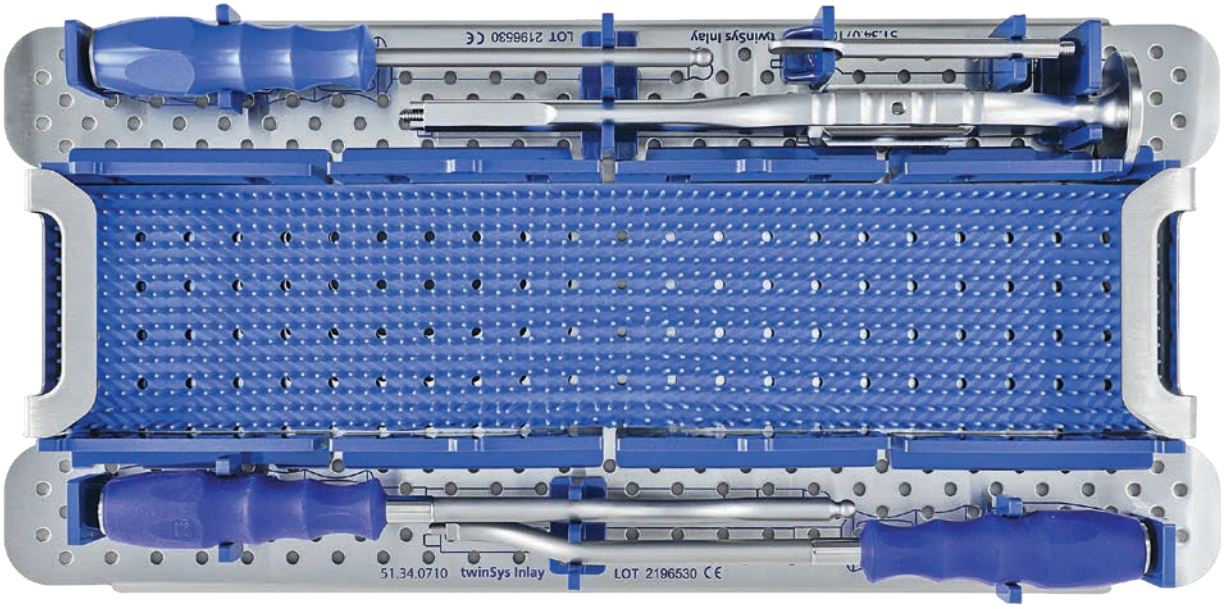
Size	Standard	Lateral
9	56.11.2000NG	56.11.2010NG
10	56.11.2001NG	56.11.2011NG
11	56.11.2002NG	56.11.2012NG
12	56.11.2003NG	56.11.2013NG
13	56.11.2004NG	56.11.2014NG
14	56.11.2005NG	56.11.2015NG
15	56.11.2006NG	56.11.2016NG
16	56.11.2007NG	56.11.2017NG

Material: FeCrNiMnMoNbN
Cone: 12/14 mm
CCD-angle: 134°

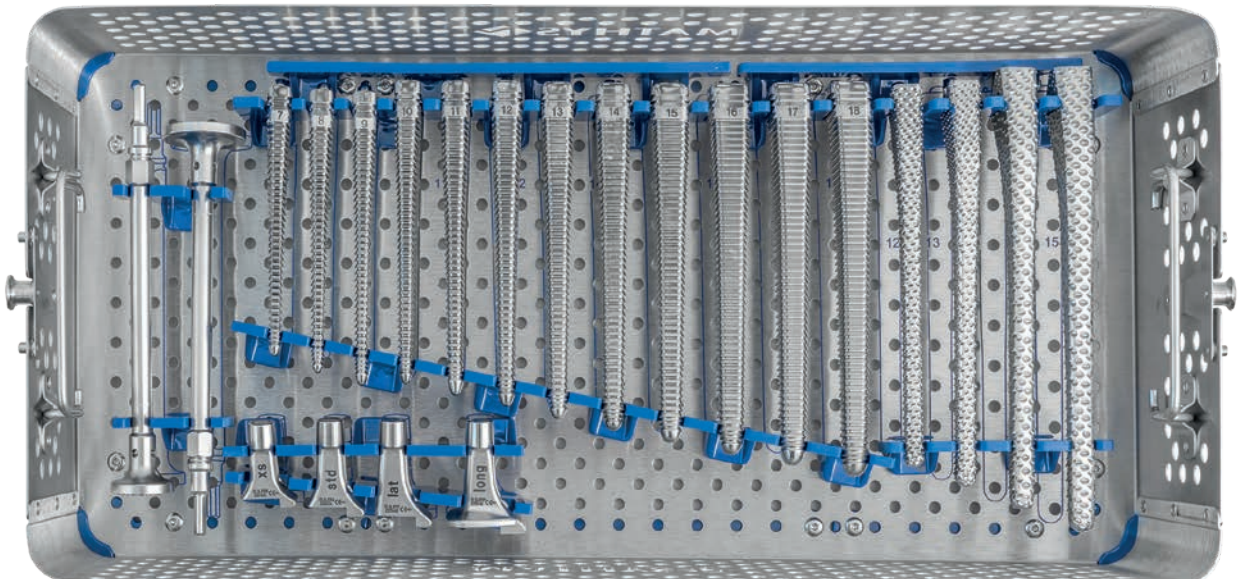
NG = Implant do not have a thread and can therefore not be used with the stem positioner with screw holder (56.02.6204). An appropriate instrument like the twinSys impactor with offset (51.34.0446) can be used.

5. Instruments

5.1 twinSys Instrumentation 51.34.1080A



Item no. 51.34.0710 **twinSys Insert**



Item no. 51.34.0711 **twinSys tray**
No Picture / Item no. 51.34.0712 **twinSys Lid**

twinSys Instrumentation 51.34.1080A

Item no.	Description
51.34.0865	Rasp twinSys, size 07
51.34.0866	Rasp twinSys, size 08
51.34.0867	Rasp twinSys, size 09
51.34.0868	Rasp twinSys, size 10
51.34.0869	Rasp twinSys, size 11
51.34.0870	Rasp twinSys, size 12
51.34.0871	Rasp twinSys, size 13
51.34.0872	Rasp twinSys, size 14
51.34.0873	Rasp twinSys, size 15
51.34.0874	Rasp twinSys, size 16
51.34.0875	Rasp twinSys, size 17
51.34.0876	Rasp twinSys, size 18

Item no.	Description
51.34.0706	twinSys trial cone standard
51.34.0707	twinSys trial cone lateral
51.34.0708	twinSys Trial cone XS

Item no.	
51.34.0446	twinSys impactor with offset

Item no.	
56.02.2017	Impactor for tapping

Item no.	
51.34.0295	MIS Stem impactor with ball

Item no.	
56.02.6204	Stem positioner w/screw holder

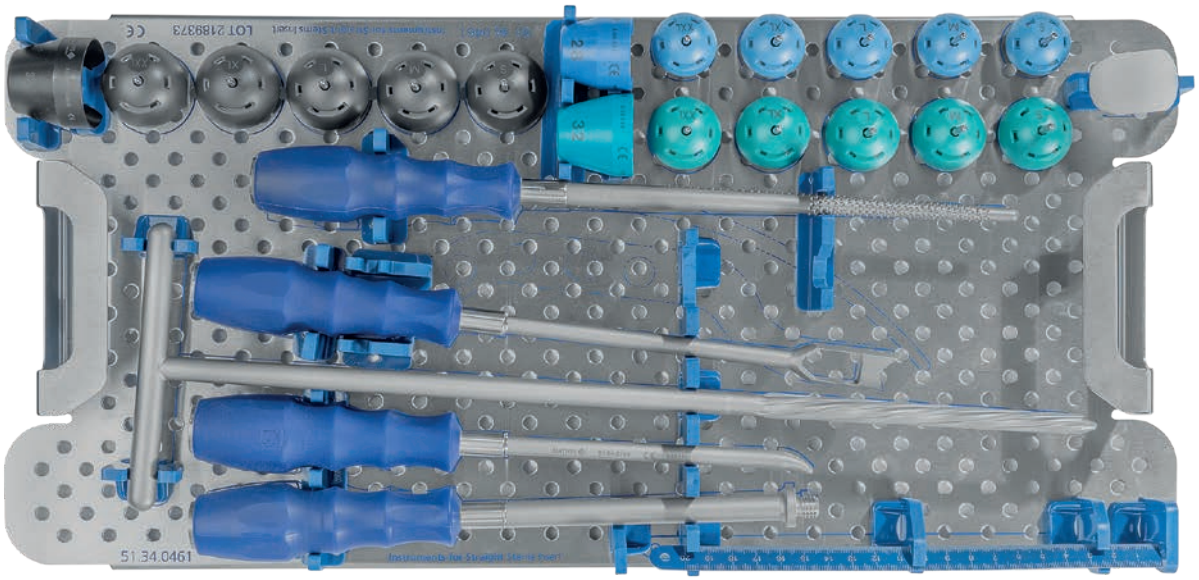
Item no.	
56.02.6203	Anteversion adaptor for stem positioner

twinSys long instrumentation

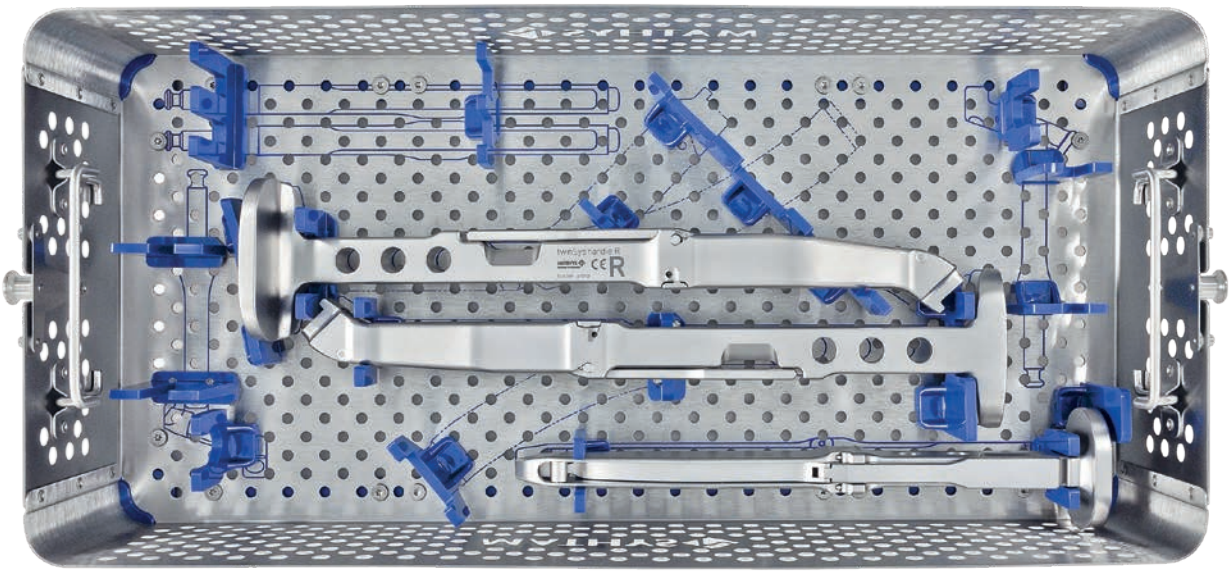
Item no.	Description
51.34.0057	twinSys Rasp long 12/158
51.34.0058	twinSys Rasp long 13/168
51.34.0059	twinSys Rasp long 14/178
51.34.0060	twinSys Rasp long 15/188

Item no.	Description
51.34.0033	twinSys calcar reamer 30 mm
51.34.0034	twinSys calcar reamer 40 mm

Item no.	
51.34.0709	twinSys trial cone long stems



Item no. 51.34.0461 **Univ. Instr. for Straight Stems insert**



Item no. 51.34.0460 **Univ. Instr. for Straight Stems tray**
No picture / Item no. 51.34.0462 **Univ. Instr. for Straight Stems lid**

Item no.	
3.30.130	Ruler length 20

Item no.	
3.30.536	Top f/head impactor

Item no.	
51.34.0076	twinSys rasp handle MIS II straight

Item no.	
51.34.0134	Box chisel silicone

Item no.	
51.34.0135	Head impactor silicone

Item no.	Description
51.34.1064	Trial head 28 S
51.34.1065	Trial head 28 M
51.34.1066	Trial head 28 L
51.34.1067	Trial head 28 XL
51.34.1068	Trial head 28 XXL
51.34.1069	Trial head 32 S
51.34.1070	Trial head 32 M
51.34.1071	Trial head 32 L
51.34.1072	Trial head 32 XL
51.34.1073	Trial head 32 XXL
51.34.1074	Trial head 36 S
51.34.1075	Trial head 36 M
51.34.1076	Trial head 36 L
51.34.1077	Trial head 36 XL
51.34.1078	Trial head 36 XXL

Item no.	
56.02.2016	Reamer, narrow

Item no.	
51.34.0469	Opening reamer for straight stems

Item no.	
51.34.0858	optimys Opening Broach

Item no.	
51.34.0136	Extractor curved silicone

Item no.	Description
3.30.537	Impactor top 36
3.30.538	Impactor top 28
3.30.539	Impactor top 32

Item no.	
51.34.0075	twinSys rasp handle MIS II offset

Item no.	
51.34.0859	optimys Opening Broach bent

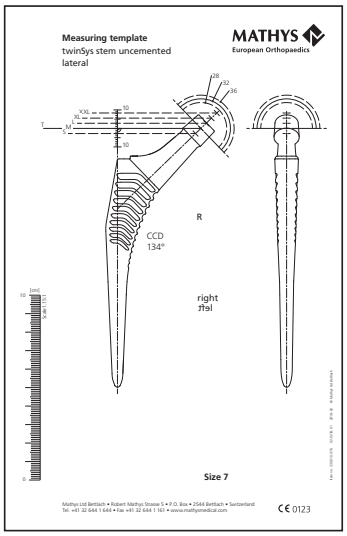
Item no.	Description
51.34.0189	twinSys double offset adaptor right
51.34.0190	twinSys double offset adaptor left

Item no.	Description
51.34.0758	Rasp handle DO Woodpecker right
51.34.0759	Rasp handle DO Woodpecker left

Item no.	
51.34.0463	Rasp adapter for Specht straight

Item no.	
58.02.4030	Box chisel MIS

5.2 Measuring template



Item no.	Description	Size
330.010.078	twinSys uncem. standard RöntgSch	7–16
330.010.076	twinSys uncem. lateral Template	7–16
330.010.055	twinSys uncemented 17/18 Template	17/18
330.010.087	twinSys XS Template	7–12
330.010.086	twinSys long stem uncemented Template	12–15
330.010.077	twinSys cem. standard Template	9–16
330.010.099	twinSys cem. lateral Template	9–16

6. References

1 Learmonth I. D., Young C., and Rorabeck C., «The operation of the century: total hip replacement». Lancet, 2007. 370(9597): p. 1508-1519.

2 Pivec R., Johnson A.J., Mears S.C., Mont M. A., «Hip arthroplasty». Lancet, 2012. 380(9855): p. 1768-77.

3 Clauss M. V. D. S., C.;Goossens, M. Prospective five-year subsidence analysis of a cementless fully hydroxyapatite-coated femoral hip arthroplasty component. Hip Int, 2014. 24(1): p. 91-7.

4 Siepen W., Zwicky L., Stoffel K. K., Ilchmann T., et al. Prospective two-year subsidence analysis of 100 cemented polished straight stems – a short-term clinical and radiological observation. BMC Musculoskelet Disord, 2016. 17(1): p. 395.

5 Skinner J. A., Todo S., Taylor M., Wang J. S., et al. Should the cement mantle around the femoral component be thick or thin? J Bone Joint Surg Br, 2003. 85(1): p. 45-51.

6 Scheerlinck Th. (2010) «Primary hip arthroplasty templating on standard radiographs. A stepwise approach». Acta Orthop. Belg., 2010, 76, 432-442

7. Symbols

 Manufacturer

 Correct

 Incorrect

 Caution

Notes

Notes

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