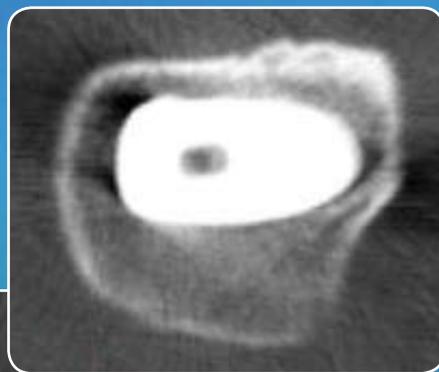


SPS *Standard / Modular*

*Surgical technique
cancellous bone compaction*



SYMBIOS®

Surgical technique

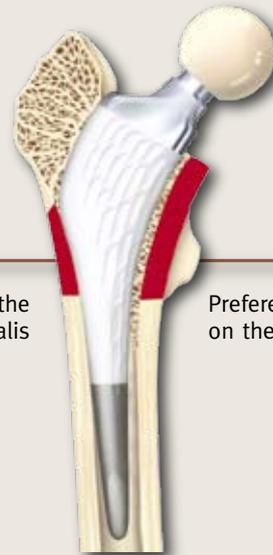
2

This technique can be applied whatever the surgical access route used. The installation of the patient, the surgical access route, incision and hip luxation are not described in this document.

Basic positioning principles

The SPS Modular and SPS Standard prostheses are described as implants with proximal anchorage. **This technique is based on the determination of preferential supports.**

- 1 **Direct support on the external corticalis** under the greater trochanter (shoulder of the stem located at the digital fossette level).

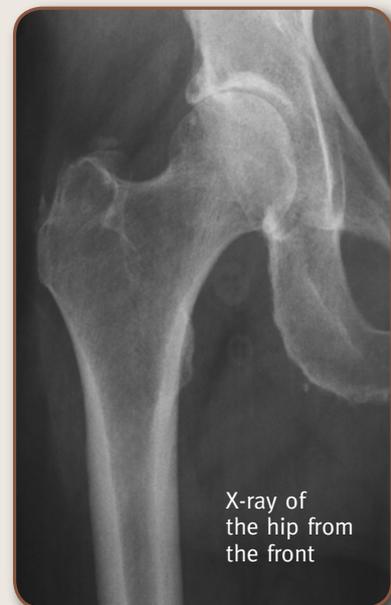
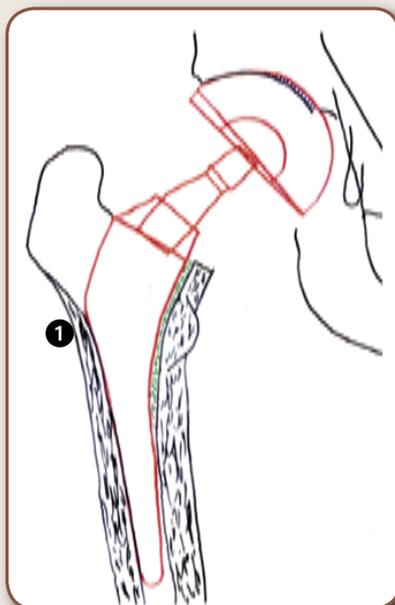


Preferential support on the external corticalis

Preferential support on the internal corticalis



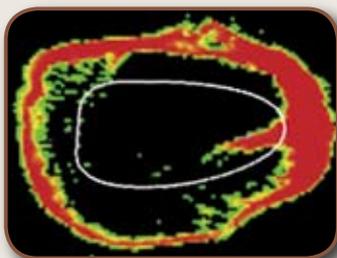
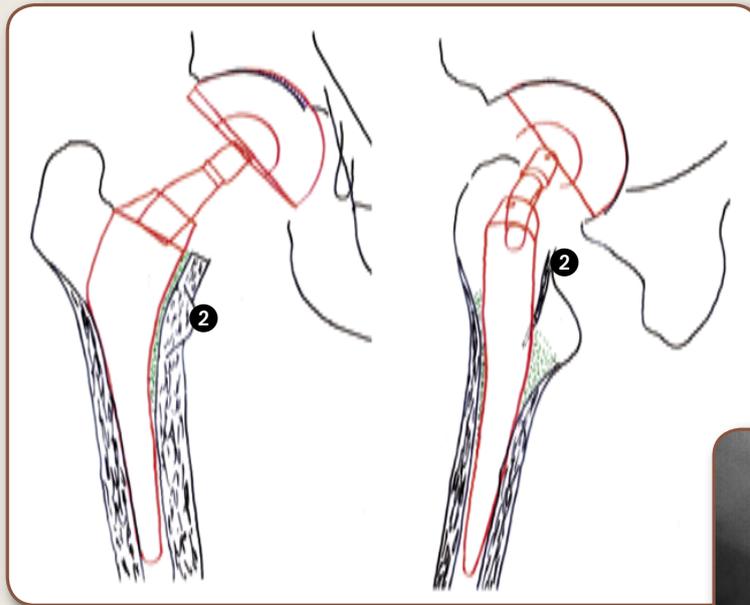
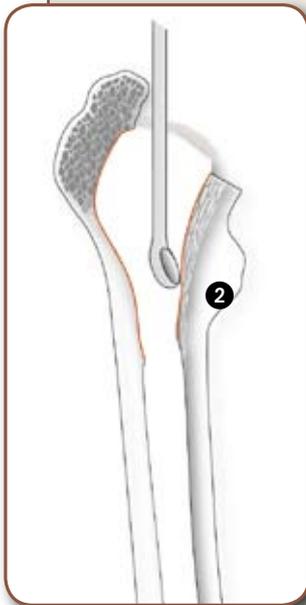
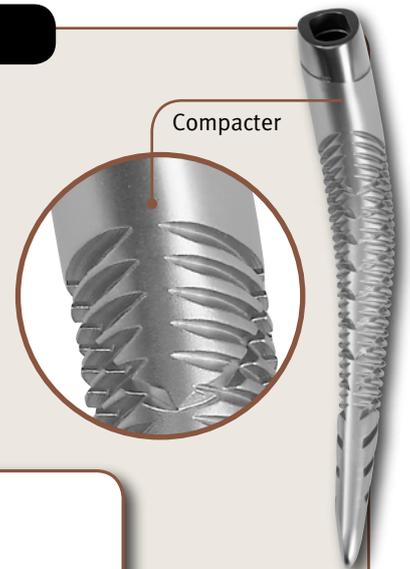
The surgeon locates the external corticalis with the curette.



X-ray of the hip from the front

Basic positioning principles

- 2 Preserve the cancellous bone on the internal corticalis
- Break down the internal septum (Merkel's spur) with a curette, **if necessary**, working from back to front since the compacter is smooth on its internal face.
 - Use the smooth compacters internally.



The spur hinders implantation

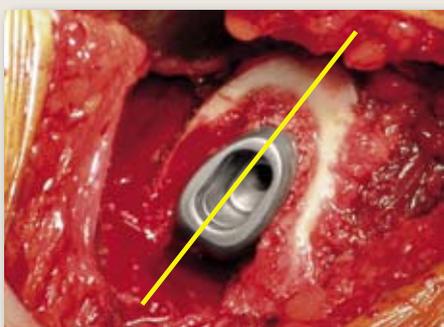


Spur removed



Basic position principles

- 3 Rotation of the implant aligned along the axis of the superior metaphysis (anterior proximal corticalis).



The surgeon maintains the compacter in the position shown.



Implant aligned along the superior metaphysis axis.



» Preliminary recommendations

We strongly recommend that 2-D or 3-D (HIP-PLAN® system) preoperative planning be performed in order to optimise the surgical result.

During 2-D planning it is important to obtain calibrated X-rays on a 1 / 1.15 scale. We advise that the stem size be planned on the profile X-ray since external rotation of the femoral segment linked to the arthrosis in the face-on X-ray may reduce the femoral flare effect.

We consider that Lequesne's false profile is better for assessing the sagittal curvature of the stem in the femur.

1

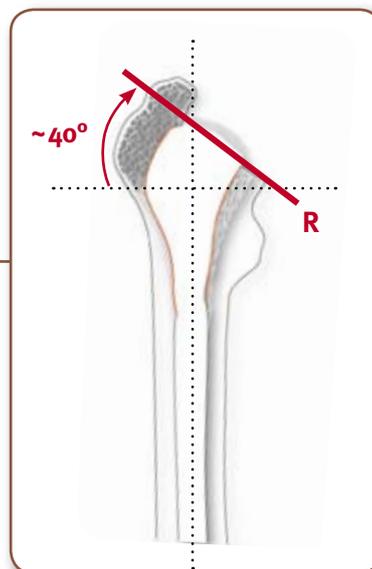
Osteotomy of the femoral neck

Using calibrated tracings on the same scale as the X-rays, the osteotomy height is determined during preoperative planning on the basis of the implant size and position as well as respect for the options and positional location markers which you normally apply (lesser trochanter, greater trochanter, digital fossette).

In general, the external proximal osteotomy point is located at the level of the digital fossette with orientation toward the internal corticalis at an angle of about 40° relative to the transverse plane, thus defining the line R drawn on the preoperative tracing.

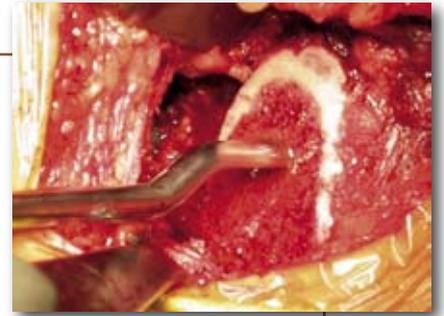
However, this osteotomy level may vary depending on the femoral flare index, the stem packing in profile (Gruen zones 9-13) and the planned prosthesis offset.

Everything depends on the balancing of positioning options (femoral remodelling) and prosthetic hip function options (femoral offset).



2 Preparation of the femur

1. The femoral canal is opened with the double curvature gouge chisel, respecting the orientation of the metaphysis.
2. The femoral canal axis can be probed with a long, thin curette to avoid false routes.
3. Find the cortical contact in the external tension zone under the greater trochanter in order to obtain excellent prosthesis seating and stability.
4. Break down the internal septum (Merkel's spur) with a curette, **if necessary**, working from back to front (see page 3 for details).



» N.B.:

If the cancellous bone is dense, the borer can be used to prepare the passage for the prosthesis shoulder at the greater trochanter level. This work is done in the proximal part of the femur.

Using scoop forceps, make sure to remove the corticalis and/or tissue residues located at the base of the femoral neck. If this is not done, these residues may prevent the introduction of the compacter and lead to its varisation.

3 Introduction of the compacters

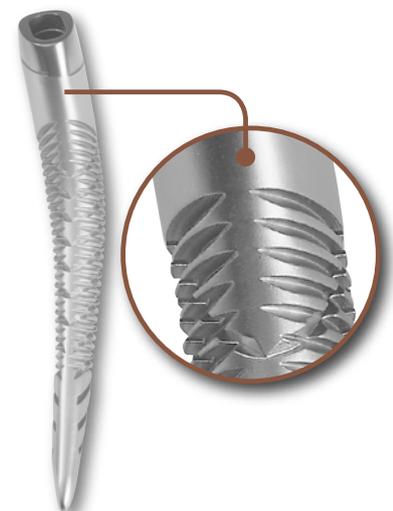
Initial comments

The femoral shaft preparation technique is **IDENTICAL** for both the SPS Modular and the SPS Standard compacters.

We use the term "compacter" and not "rasp" since their design allows compaction of the cancellous bone on the internal corticalis. To obtain this effect, there are no grooves on the internal part of the compacter.

There are 7 right compacters and 7 left compacters (B to H) which have a curved profile identical to that of the definitive SPS prosthesis.

The compacters can be used as trial implants, both standard and modular, in order to test the coxo-femoral articulation with modular cones or necks and trial heads.



Introduction of the compacters (continued)

Compacter B corresponds to a non-modular size B stem.

Since the SPS stem is an anatomical prosthesis, it is important to check that the compacters used properly correspond to the side being operated on.

The compacters should be inserted progressively from size B to the size chosen during preoperative planning or until compacter stability is obtained.

The first compacter must be inserted perfectly axially so as to prepare the trajectory for the subsequent compacters, which will progressively compact the cancellous bone on the femoral corticalis.

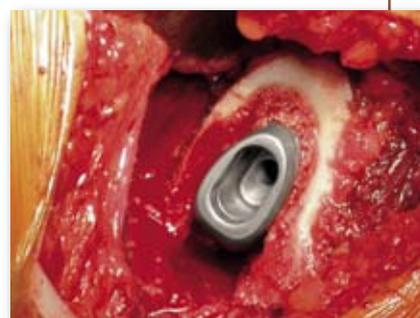
Guiding and rotation

The SPS stem exhibits anatomical geometry that follows the natural helitorsion of the femur. Because there is some variability in this femoral helitorsion, it is important to ensure that the compacter does not turn forward since this could cause cortical cracking. The compacter needs to be kept rotating.

There are three causes of cracking or splitting:

1. A compacter in a varus position
2. Insufficient spur removal, making the compacter turn forward (anterior crack)
3. Insufficient preparation of the posterior cancellous bone (posterior crack)

At the end of impaction, when the chosen impactor seems to be "docked", its axis must be aligned with that of the metaphysis. Check its stability in three planes.



>> **Determination of the definitive choice of sizes (stems, necks, heads)**

1 Choice of stem

1. The size determined during preoperative planning

Progressively increase the compacter size until the size chosen during preoperative planning is reached.

Depending on the density of the cancellous bone, the definitive size may be one size below or above the planned size.

Check the position of compacter line R relative to the osteotomy level.

2. A dull sound during impaction indicates that the prosthesis is “docked”

If the size adopted intraoperatively is more than one size less than the size chosen preoperatively, the reasons preventing progression of the compacters need to be analysed.

The factors that limit progression are essentially:

- Posterior residues at the osteotomy level.
- Merkel’s spur (internal septum) not removed.
- Excessively dense cancellous bone.
- Abnormal rasp position (varus, false pathway).

The definitive stem size corresponds to the size of the last compacter positioned in the femur. Check that its shoulder is positioned at the same level as the compacter shoulder.

We recommend that reduction trials be performed with the compacter in place and fitted with a neck and trial head in order not to damage the grip cones of the definitive implants.



2 Choice of modular neck length and of the head

The modular neck and the head were chosen during preoperative planning.

Reduction trials are performed with the trial compacter, trial neck and trial head in place.

Thanks to the reduction trials, the stability of the coxo-femoral articulation is checked together with the equality of leg lengths with the trial heads and trial necks.



>> Insertion of the definitive implants

1 Insertion of the modular neck

We recommend that reduction trials be performed with the compacter and that the definitive modular neck be assembled on the definitive stem outside the surgical field. However, the modular neck may also be positioned after implantation of the definitive stem. **In all cases it is important to ensure that the oblong forms of the stem and the modular neck are thoroughly clean in order to guarantee the mechanical integrity of the stem-modular neck assembly.**

When the definitive modular neck is in place, **GENTLY** impact it with the **UNIVERSAL** neck impacter.



2 Implantation of the definitive prosthesis

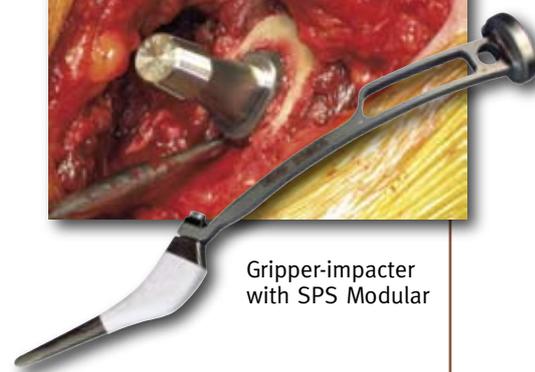
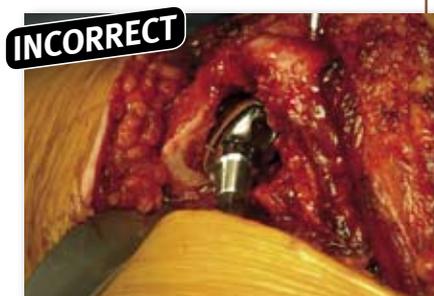
The SPS Modular or SPS Standard stem should be impacted by pushing it at the tip and without touching the hydroxyapatite coating at all. The definitive prosthesis may be implanted without its collar by using the gripper-impacter provided for this purpose.

The definitive positioning of the stem is determined by the hydroxyapatite/titanium edge of the prosthesis, which should be located at the level of the osteotomy. It is advisable to abate the striking force in the last centimetre.

The prosthesis itself finds its final anteverision as determined by the preliminary compacter work.

It should be noted that the SPS Modular system includes 6 right sizes and 6 left sizes (C to H). The stem are 2/3 coated with porous titanium and hydroxyapatite.

The head/modular neck junction is ensured by a 10/12 or 12/14 grip cone.



Gripper-impacter with SPS Modular

3 Placement of the definitive head

The **BIOLOX® forte or delta-CeramTec®** aluminium heads are exclusively combined with 12/14 grip cones.

Hold the chosen femoral head and attach it to the grip cone of the corresponding modular neck by giving it a quarter turn clockwise. Fix the head to the cone by impacting it **GENTLY** with the head impactor (ref.: instructions for use of **CeramTec®**).

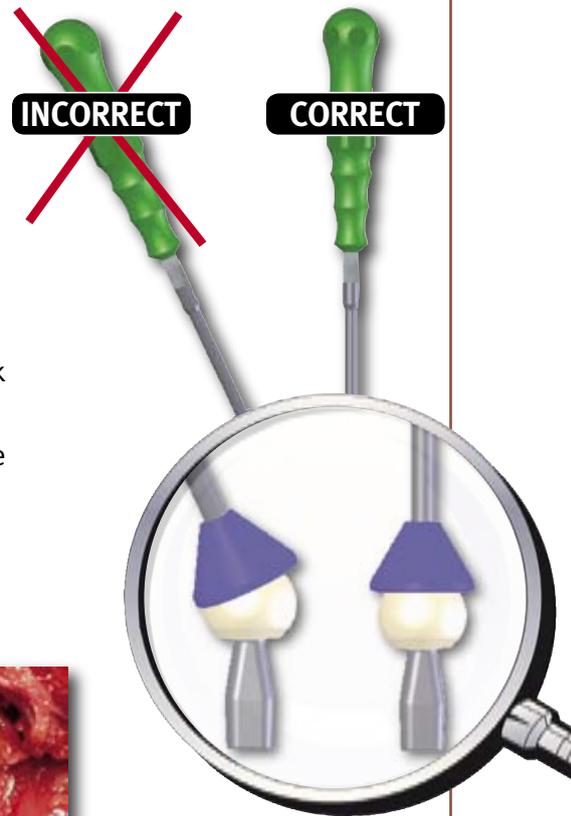


The impaction must be undertaken along the axis of the prosthesis neck (see diagram)



INCORRECT

CORRECT



>> N.B.:

- 1) If the oblong surfaces of the definitive stem and modular neck are damaged, it is **ESSENTIAL** to replace these implants.
- 2) If the oblong surface of the stem remains **VISUALLY INTACT**, the insertion of a new modular cone is allowed.







SPS



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