



BEZNOSKA

We bring back joy to movement



Cemented femoral stem - type CSC



Preface

The cemented femoral stem – type CSC with centralizer – was designed using the latest knowledge and experience with cemented endoprostheses and the most modern technology is used during its manufacturing. Easy implantation and thorough fixation of implants are ensured when using instruments supplied by the manufacturer. The size series of stems makes it possible to solve almost every case that may occur in the first implantation of a cemented hip joint replacement.

The purpose of this publication is to serve as a surgical technique manual for work with the given concrete implant and the instrumentation set. For the sake of conciseness, it is focused only on the implantation of the given type of replacement and it expects the surgeon as well as other staff to be perfectly informed about general rules of hip joint surgeries. The aim of this publication is to enable the surgeons and suture nurses a quick orientation and information about the right use of individual elements of the instrumentation set, in order to achieve the optimal result and, last but not least, to avoid unnecessary damage to the instrumentation set or even to the implant. By no means is it a textbook of surgical technique.

Characteristics of the implant:

Cemented stem with centralizer

The centralizer ensures a uniform thickness of the bone cement from 1,5 mm to 2,0 mm. This thickness is resulting from rasp and stem sizes (both).

Advantage of the straight stem shape

The straight stem copies better the shape of the medullary canal of the femur.

Three-faced stem profile

This shape causes less pressure in the cemented sheath and therefore minimizes the risk of bone cement fragmentation and subsequent loosening of the implant.

Stems polished to mirror-like gloss

No abrasive wear of the stem due to hard particles in the bone cement occurs.

Warning for surgeons: Before the decision to apply cemented stem type CSC sizes 0 or/and 1 is taken, patient’s body weight as well as his/her motion activity are to be reviewed. The manufacturer does not recommend to perform sizes 0 or/and 1 into the patients weighing over 80 kg, and/or being exposed to higher motion activity.

Cemented femoral stem type POLDI



Cemented femoral stem type CSC



The cemented femoral stem type Poldi is the most used type of endoprosthesis in the Czech Republic. Over 150 thousand successful implantations since the first model line (in 1972) demonstrate unequivocally the quality and reliability of this implant.

On the basis on thirty years of experience and in response to new trends in orthopaedics, the company BEZNOSKA launched in 2003 a modern cemented stem – type CSC with centralizer.



Surgical technique – general principles

Before any surgery of total hip joint replacement, it is necessary to make a pre-surgery planning that will enable us to determine the correct size of the femoral component. An X-ray picture of the pelvis and of both hip joints in A/P and axial projection must be available for the pre-operation planning in order to determine the metaphysis width. Templates supplied by the manufacturer are used for planning of size of the femoral component. To determine the correct size it is necessary to have the X-ray pictures with the same magnification.

The surgery of the total hip joint replacement may be carried out using any approach according to the surgeon’s habitual practice.

The surgical technique and the surgical procedure differ according to the approach selected. At the usual antero-lateral approach, first resect the head with the neck and then proceed to surfacing and prosthetic replacement of the acetabular cup. Adjustment of the femur medullary canal and insertion of the femoral component is thus carried out only after the acetabular phase is completed.

On the contrary, at the postero-lateral approach, we first dislocate the head backwards and then we open the medullary cavity in fossa piriformis using a perforator, without resecting the head. Subsequently, the medullary canal is shaped to the selected size and only then the osteotomy at the neck basis is carried out and the head is removed. We therefore perform the adjustment and replacement of the acetabular cup only after the preparation of the femur medullary canal. After the acetabular component is inserted, we finally implant the stem into the prepared medullary canal of the femur.

Table of correct relations between the instruments used in shaping the medullary canal and the inserted implants.

Identification of stem and rasp size	Identification of centralizer size	Dimension of the centralizer – circumscribed circle [mm]	Corresponding diameter of milling cutters [mm]
①	①	10	10
②	②	12	12
③	③	14	14
④	④	16	16
⑤	⑤	18	18

Surgical Technique

1. Perforation corticalis

Perforator ① shall be used only at posterior approach when the patient is positioned on his/her side (Fig. 1). At antero-lateral approach, this instrument is not used after the resection of the head. When using the perforator, the hole must be located in fossa piriformis.

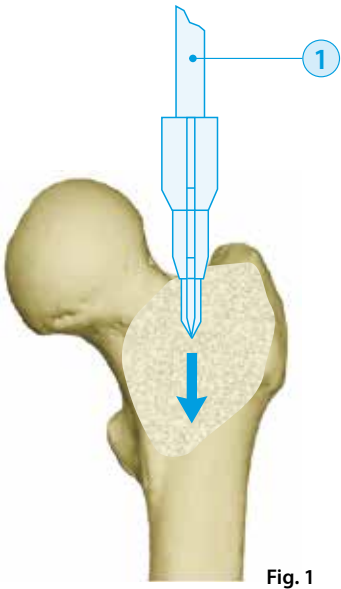


Fig. 1

2. Resection of the head

The head is resected using an oscillation saw (Fig. 2). In case of a posterior approach, the head is resected only after the use of the perforator ① and of the milling cutters ③ to ⑧ with cylindrical stem according to point 3. The perforator and the cutters can be fixed into the quick-clamping „T” handle ②.

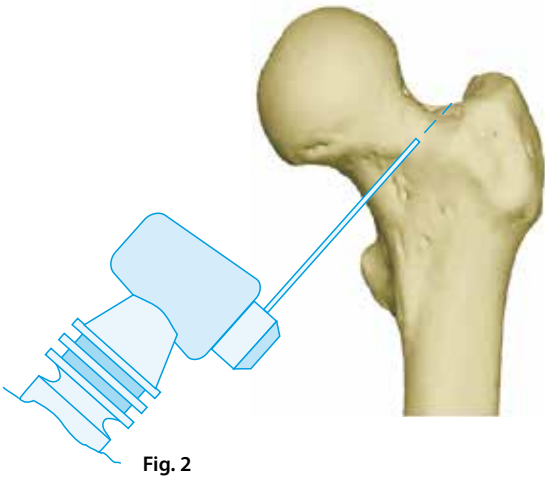


Fig. 2

Numbers marked ① correspond to the cassette lay-out (see page 12).



3. Widening of entrance to the metaphysis part of the canal

A window-chisel ⑨ is used to widen the metaphysis part of the medullary canal under the osteotomy line (Fig. 3). The point of the chisel must run along the interior lateral surface of the cortical bone. The orientation of the chisel must keep the planned anteversion of the femoral component (10 to 15°).

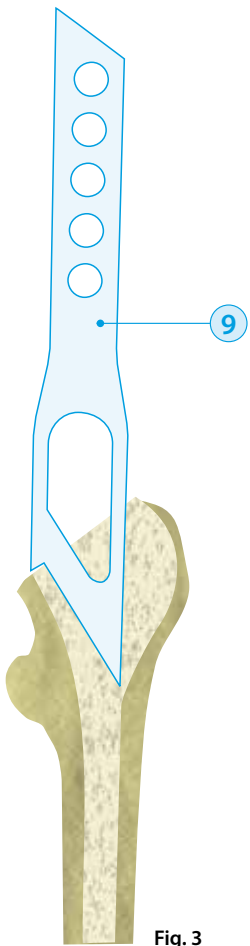


Fig. 3

4. Milling of the medullary canal

Special milling cutters ③ to ⑧ with cylindrical stem are used to mill the medullary canal, which facilitates subsequent rasping and, at the same time, a precise circular hole for the centralizer is created (Fig. 4). First, milling cutters of 8mm in diameter are used, followed by 10mm cutters corresponding to the stem size 0 and 1. The following cutters are graded by 2mm – 12, 14, 16 and 18mm in diameter. Milling is done gradually up to the diameter corresponding to the selected implant – (see Table p. 4). A strip on the cutters indicates the milling depth.

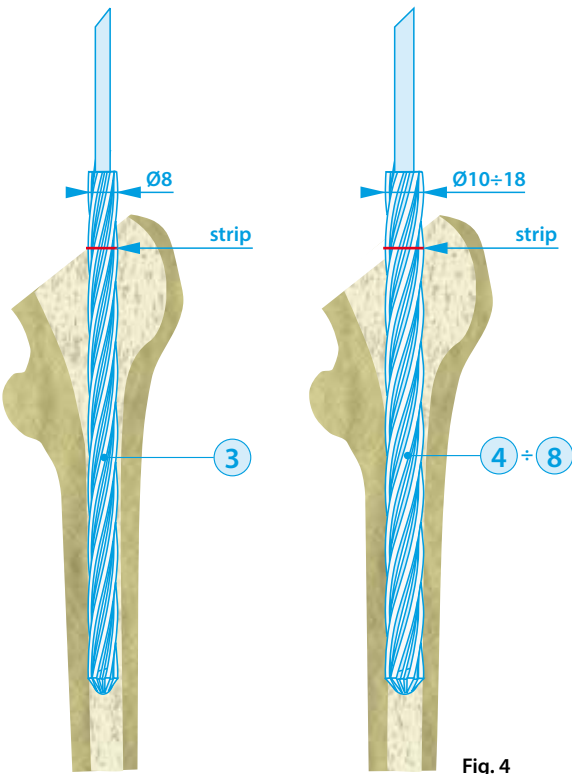


Fig. 4

5. Preparation of the medullary canal

Preparation of the medullary canal is carried out using a set of rasps ⑩ to ⑮ (Fig. 5). It is necessary to use always the rasp corresponding to the size of the stem to be implanted, which ensures the required thickness of the cemented covering.

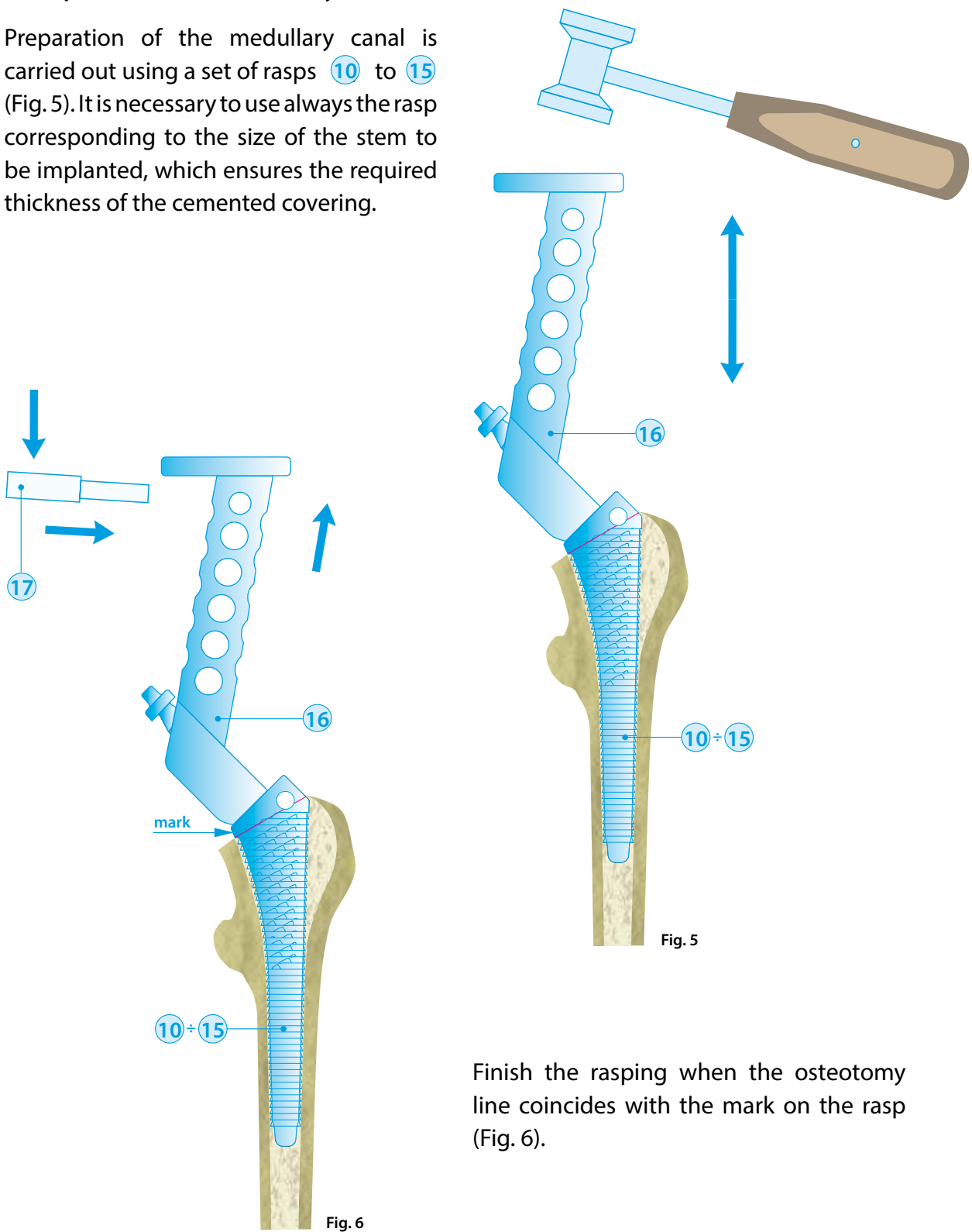


Fig. 5

Fig. 6

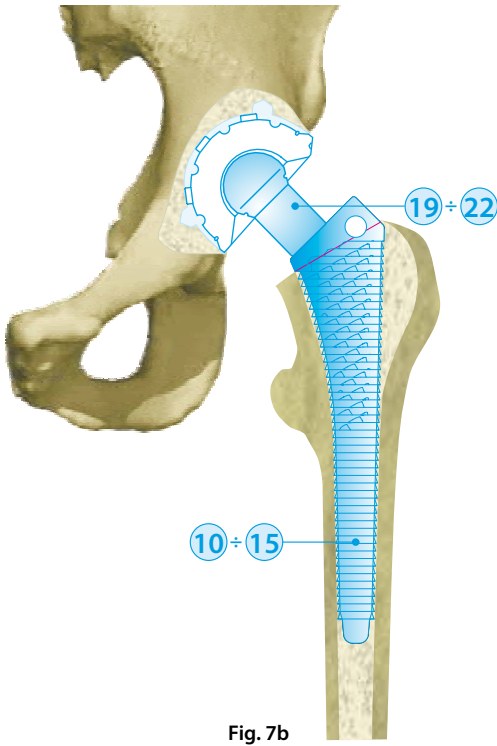
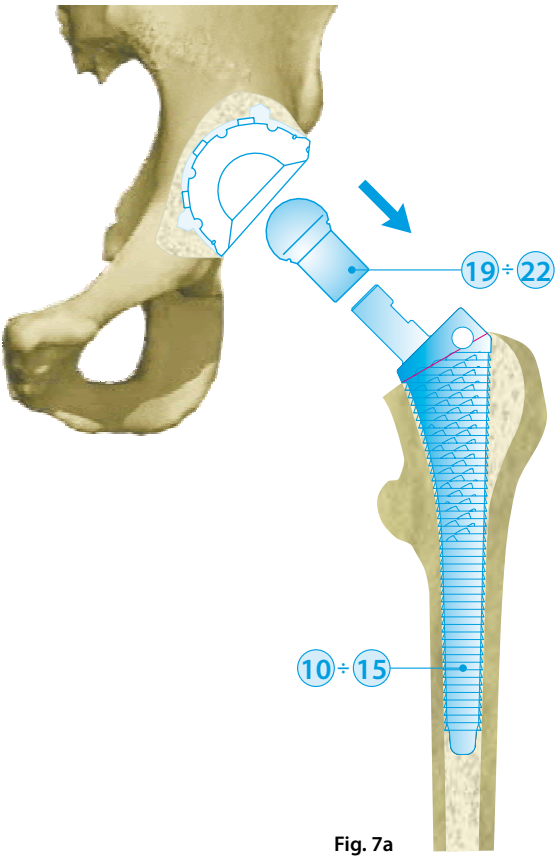
Finish the rasping when the osteotomy line coincides with the mark on the rasp (Fig. 6).



6. Preliminary test of articulation (on the rasp)

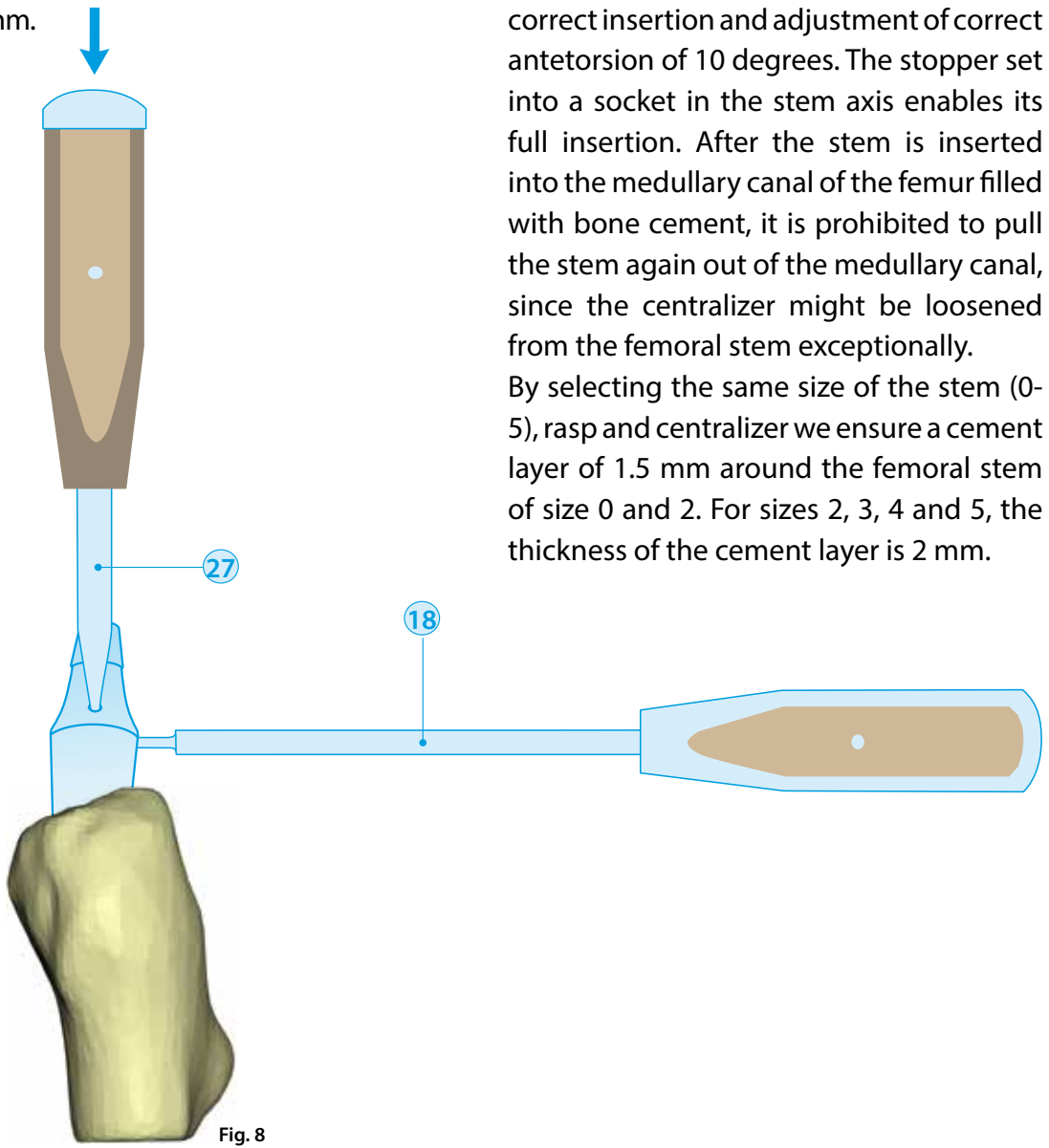
Preliminary articulation into the artificial acetabular cup is carried out using a plastic testing head 19 to 22 fixed on the cylindrical neck of the rasp (Fig. 7a). Testing heads are available in four options differing by the neck length – S, M, L, XL (Fig. 7b).

To remove the rasp from the medullary canal it is necessary to fix the handle 16 with the extractor pin 17 again on the rasp – see Fig. 6.



7. Application of bone cement

Insert a cancellous or a polyethylene plug into the medullary canal using a special instrument and insert a Redon drain that removes haematoma from the distal pole of the medullary canal. Thus the close contact between cement and inner surface of cortical bone is provided for. The thickness of such a newly created casing is to be 1,5 mm (valid for size 0 or/and 1 only), which fully depends on the rasp size used. By bigger stem sizes (in a dependance upon bigger rasps used) the thickness of the cemented casing is increased to 2 mm.



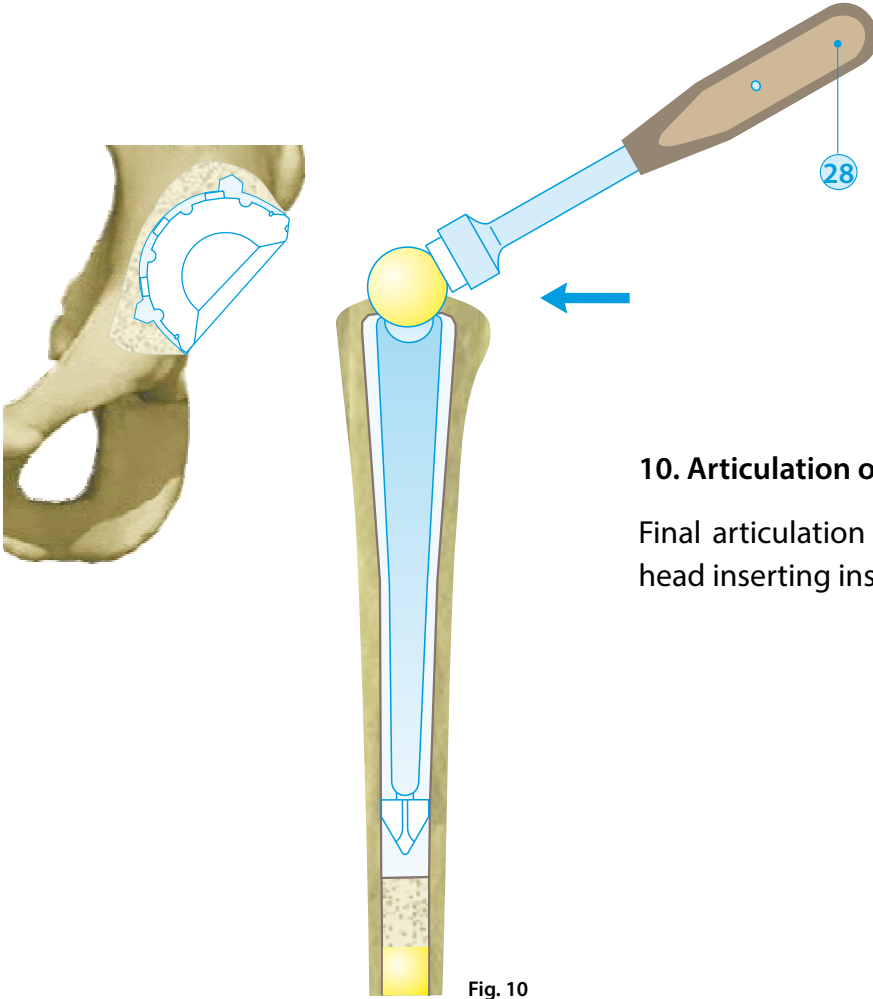
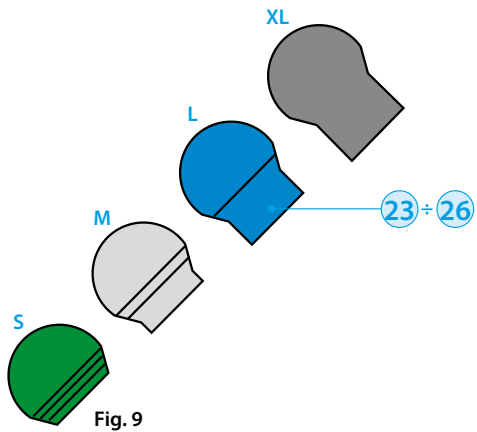
8. Insertion of femoral component

Insert a centralizer of a corresponding size into the hole in the bottom part of the stem and rotate it by 90° approx. while applying pressure in the direction of the stem axis. When this procedure is observed, the centralizer is anchored in the femoral stem. After removing the drain, insert the stem into the medullary canal using two instruments – inserter 18 and stopper 27 (Fig. 8). The inserter is inserted into a hole of 5 mm in diameter in the upper part of the endoprosthesis, which facilitates correct insertion and adjustment of correct antetorsion of 10 degrees. The stopper set into a socket in the stem axis enables its full insertion. After the stem is inserted into the medullary canal of the femur filled with bone cement, it is prohibited to pull the stem again out of the medullary canal, since the centralizer might be loosened from the femoral stem exceptionally. By selecting the same size of the stem (0-5), rasp and centralizer we ensure a cement layer of 1.5 mm around the femoral stem of size 0 and 2. For sizes 2, 3, 4 and 5, the thickness of the cement layer is 2 mm.



**9. Final test of articulation
(of the femoral component)**

The final test of articulation is carried out using a test or a polyethylene articulation insert. One of the four testing plastic heads 23 to 26 is used for this test of articulation (Fig. 9) and an appropriate metal or ceramic head is selected upon the test results.

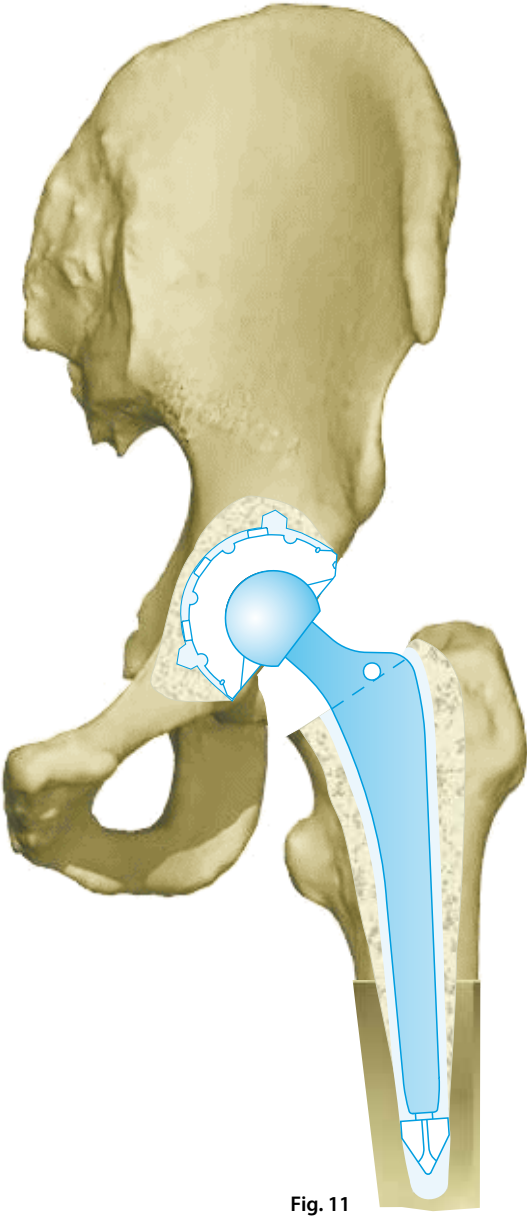


10. Articulation of the endoprosthesis

Final articulation is carried out using the head inserting instrument 28 (Fig. 10).

11. Final result of the surgery

Position when the head has been articulated into the acetabular cup (Fig. 11).





Instrumentation set

The set of instruments is placed in a one cassette allowing a clear arrangement of the instruments not only during transportation, storage and preparation, but also during the surgery. The arrangement of the instruments in the cassette corresponds to pictures in the surgical technique manual.

During transportation, the cassette is placed in a container allowing sterilization.



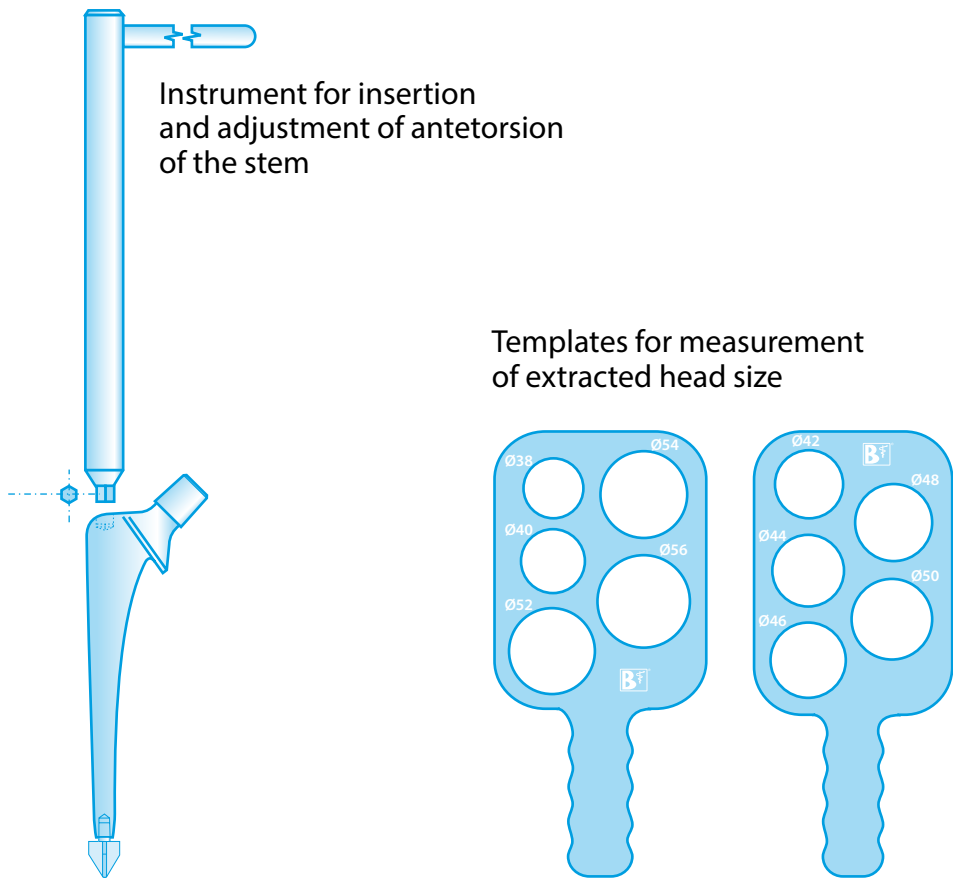
INSTRUMENTS FOR APPLICATION OF CEMENTED STEM TYPE CSC			
CASSETTE LAY-OUT			
	Denomination	Qty	Ordering number
	Complete set		300870
1	Perforator for femoral stem	1pc	304000
2	T-handle with triangular head	1pc	304002
3	Milling cutters (CSC) cylindrical – triangular end (Synthes), ø 8	1pc	301388
4	Milling cutters (CSC) cylindrical – triangular end (Synthes), ø 10	1pc	301390
5	Milling cutters (CSC) cylindrical – triangular end (Synthes), ø 12	1pc	301392
6	Milling cutters (CSC) cylindrical – triangular end (Synthes), ø 14	1pc	301394
7	Milling cutters (CSC) cylindrical – triangular end (Synthes), ø 16	1pc	301396
8	Milling cutters (CSC) cylindrical – triangular end (Synthes), ø 18	1pc	301398
9	Window-chisel for femoral stem	1pc	304025
10	Rasp for straight femoral stem type CSC, size 0	1pc	301370
11	Rasp for straight femoral stem type CSC, size 1	1pc	301371
12	Rasp for straight femoral stem type CSC, size 2	1pc	301372
13	Rasp for straight femoral stem type CSC, size 3	1pc	301373
14	Rasp for straight femoral stem type CSC, size 4	1pc	301374
15	Rasp for straight femoral stem type CSC, size 5	1pc	301375
16	Rasp handle	1pc	304045
17	Extractor pin	1pc	304052
18	Endoprosthesis inserter	1pc	301750

	Denomination	Qty	Ordering number
19	Trial head 28 for rasp of femoral stem type CSC, size XL	1pc	301384
20	Trial head 28 for rasp of femoral stem type CSC, size L	1pc	301383
21	Trial head 28 for rasp of femoral stem type CSC, size M	1pc	301382
22	Trial head 28 for rasp of femoral stem type CSC, size S	1pc	301381
23	Plastic trial head diameter 28mm, cylindrical 12/14, size S	1pc	307205
24	Plastic trial head diameter 28mm, cylindrical 12/14, size M	1pc	307204
25	Plastic trial head diameter 28mm, cylindrical 12/14, size L	1pc	307203
26	Plastic trial head diameter 28mm, cylindrical 12/14, size XL	1pc	307202
27	Stopper for femoral stem type SF	1pc	304070
28	Head inserting instrument	1pc	304075
29	Cassette with lay-out	1pc	300875

Note: The cassette lay-out has only an informative character and may be amended depending on innovation changes carried out.

Additional instruments for hemiarthroplasty replacement type CSB

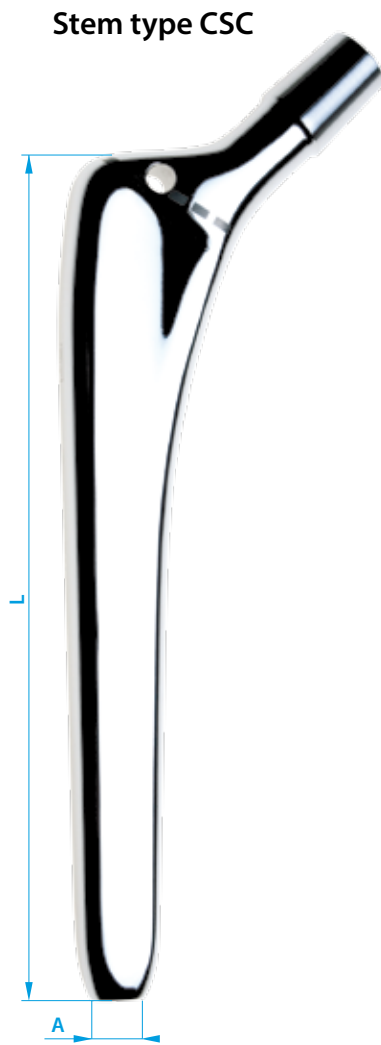
The instrumentation set can be extended with a stem inserting instrument CSB (ordering no. 301760) and two templates for measurement of extracted head size (ordering no. 301901 and 301902). The extended instrumentation set can be used during implantation of a hemiarthroplasty hip joint replacement type CSB.



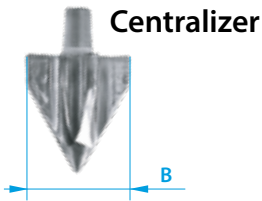


Implants

The stem of a total hip joint replacement type CSC, designated for implantation with a PMMA centralizer and with bone cement is made of quality stainless steel in accordance with the norm ISO 5832-9. The stem is supplied in six sizes and it is polished to mirror-like gloss. The neck of the endoprosthesis ends in a 12/14 taper (EURO) with embossed surface allowing the use of ceramic heads. The CD angle is 135 degrees.



Size	A [mm]	L [mm]	Ordering number
0	6	118	317000
1	6	124	317001
2	8	130	317002
3	10	136	317003
4	12	142	317004
5	14	148	317005



Centralizer size	Stem size	B [mm]	Ordering number
1	0/1	10	317011
2	2	12	317012
3	3	14	317013
4	4	16	317014
5	5	18	317015

Combination of CSC stem with other implants
manufactured by BEZNOSKA company

