



AVANTAGE[®]
Acetabulum System

Surgical Technique



TOTAL ACETABULUM SOLUTIONS
Avantage[®]
since 1998

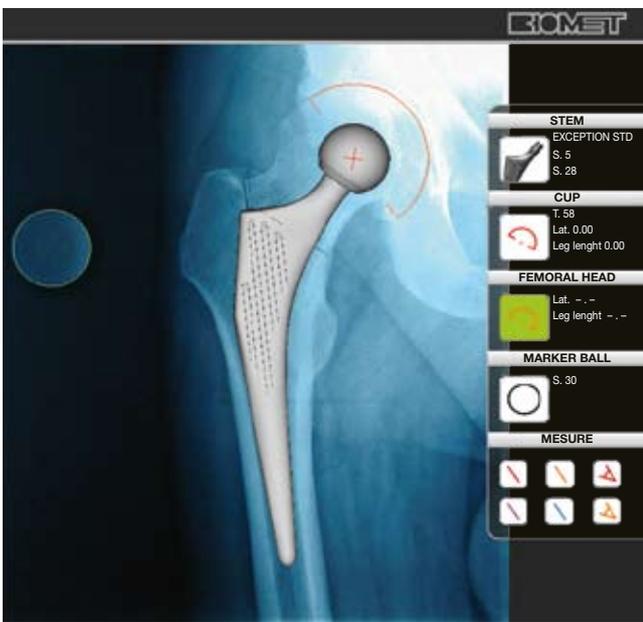
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1. Pre-Operative Planning

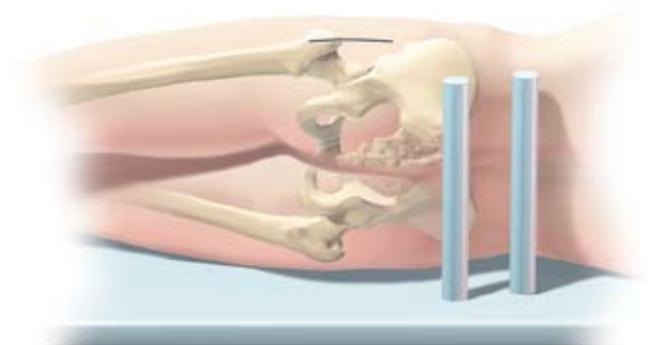
Pre-operative planning can be achieved with AVANTAGE® X-ray templates or digitally by means of a PAC system.

It is necessary to use a magnification marker with a known dimension to carry out accurate templating of the anatomy.



2. Surgical Exposure

The AVANTAGE® hip system can be implanted using any of the standard approaches for total hip replacement.



3. Acetabular Reaming

It is important to start reaming with the smallest diameter grater reamer available, perpendicular to the acetabulum, in order to find the true acetabular floor.



Sequential reaming then follows, ensuring that the reamer handle is angled at the same orientation of the component to be implanted, 40 to 45 degrees of inclination and 10 to 15 degrees of anteversion (Figure 1).

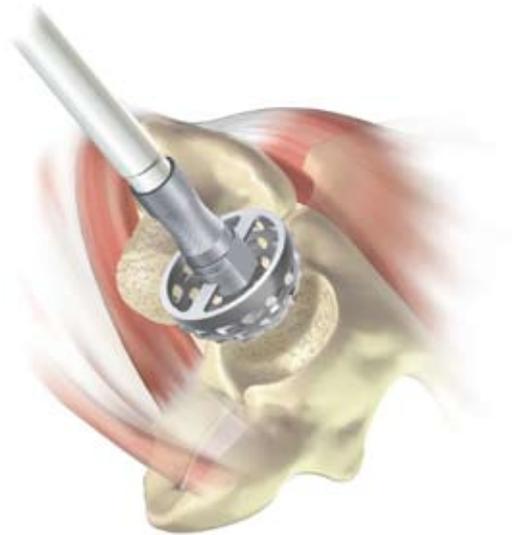


Figure 1

4. Acetabular Gauging

The AVANTAGE® cup is implanted size to size:

**Reaming diameter = Gauging diameter
= Definitive implant diameter**

Assemble the appropriate trial cup onto the trial cup positioner. The gauge selected should correlate directly with the size of acetabular component.



Impact the trial cup in the reamed acetabulum. A 5mm slot on the trial cup indicates the future position of the superior rim of the definitive implant. This slot must be positioned towards the superior rim of the acetabulum (Figure 2).

Once impacted, the trial cup should remain stable in the acetabulum. Should the trial cup be unstable, it may be necessary to increase the diameter of the final grater reamer. Should the stability of the trial cup remain unsatisfying, it is recommended to use the **AVANTAGE® 3P**.

The supplementary pegs & the 4.5mm screw of the 3P cup will enhance the acetabular primary fixation.



Figure 2

5. Acetabular Implant Insertion

Assemble the black impactor tips, corresponding to the definitive acetabular component size, with the impaction handle using the expansion rod.



Partially engage the thread of the tip of the expansion rod into the impaction handle through the black impactor tip. Care must be taken not to expand the diameter of the black impactor tip.

Mount the final implant onto the impaction assembly. Align one of the black impactor tip slots with the laser mark on the superior rim of the definitive implant, and fully screw the impaction handle until the cup is secured on the expanded tip (Figure 3).

Care must be taken to position the flat surface of the black impactor tip flush with the superior rim of the cup.

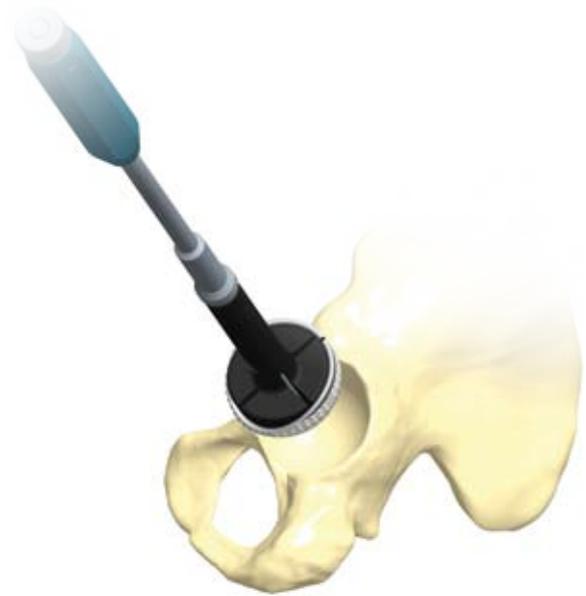


Figure 3

Cup impaction

The 45-degree angulation guide can be mounted onto the impaction handle for an accurate cup inclination (Figure 4).

Partially unscrew the impaction handle and tap it gently to release the black impactor tip from the cup.



Figure 4

Should the cup be inadequately oriented, the orientation nozzle can be used as shown (Figure 5).



Should there be need to carry out additional impaction of the acetabular component, the final impaction tip can be used.



Figure 5

6. Trial Inserts

The trial inserts are available in 22mm diameter (green inserts) and 28mm (blue inserts).

Select the appropriate trial head and seat it inside the trial insert corresponding to the implanted cup size.

Sit the trial assembly onto the trial stem or definitive femoral implant (Figure 6).

Use the head pusher to reduce the trial into the AVANTAGE® cup.

The usual assessment of joint stability, range of motion and leg length should be carried out (Figure 7).



Figure 6

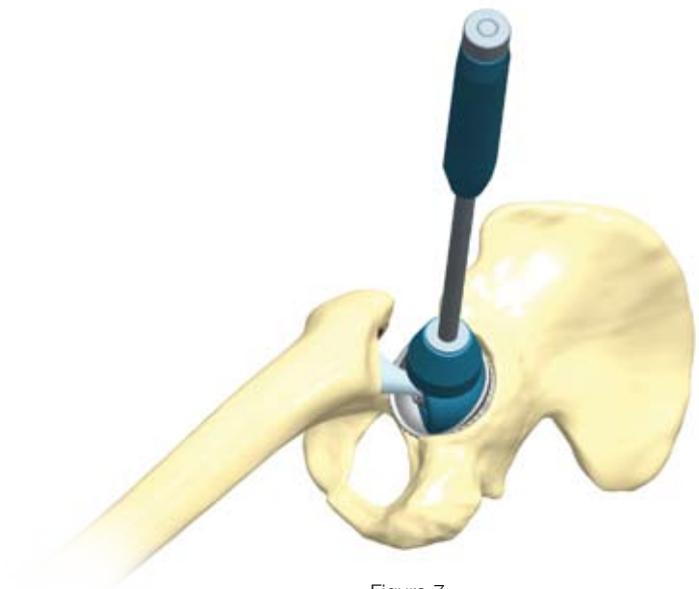


Figure 7

7. Definitive Implants Reduction

Assemble the appropriate femoral head and polyethylene insert using the press.

Open the press completely.

Slide the press base plate over the fork of the press to assemble a modular femoral head and insert. Tighten the base plate with the adjusting knob. Should a monobloc femoral implant be implanted, the fork of the press must be positioned under the femoral head (Figure 8).

Place the press assembly on the instrumentation table and position the femoral head on the black lug of the base plate.

Position and hold the insert above the femoral head.

Rotate the press handle clockwise until the head is forced into the insert (Figure 9).

A distinctive “pop” sound should be heard.

Open the press by rotating the press handle anticlockwise and check that the femoral head rotates freely in the insert (Figure 10).

Use the press again should the femoral head be inappropriately assembled into the polyethylene insert.

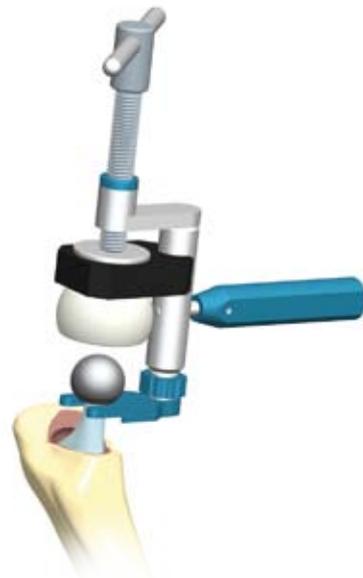


Figure 8



Figure 9

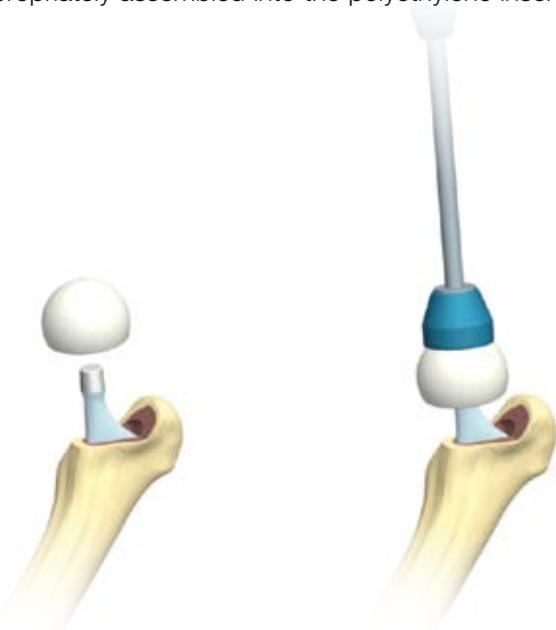


Figure 11

Impact the assembled femoral head and insert on the neck of the final femoral implant and gently impact them using the head reducer (Figure 11).

Finally, reduce the final implants into the AVANTAGE® cup (Figure 12).



Figure 10



Figure 12

3P Cup

Preparation / Impaction

The assembly of the AVANTAGE® 3P on the impaction device is similar to that of the AVANTAGE® RELOAD (See page 5).

When using the 3P cup, the superior rim laser mark is replaced by the superior plate.

Prior to impaction, it is necessary to bend the superior plate so that it fits the anatomy of the acetabulum contour. Use the bending iron whilst securely holding the cup (Figure 13).

The cup is positioned, oriented and impacted in the same fashion as the AVANTAGE® RELOAD implant (See page 5) (Figure 14).



Figure 13

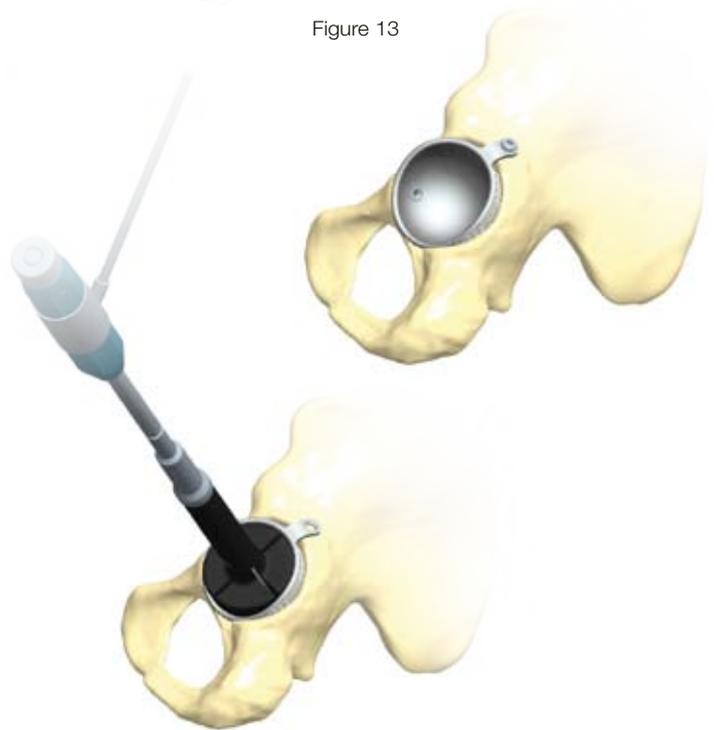


Figure 14

Pegs positioning

The 2 pegs should be implanted prior to the 4.5mm screw insertion.

Using the flexible drill shaft, the short drill and the drill guide, drill through the cup holes. Finalise the peg preparation with the peg shaper (Figure 15).

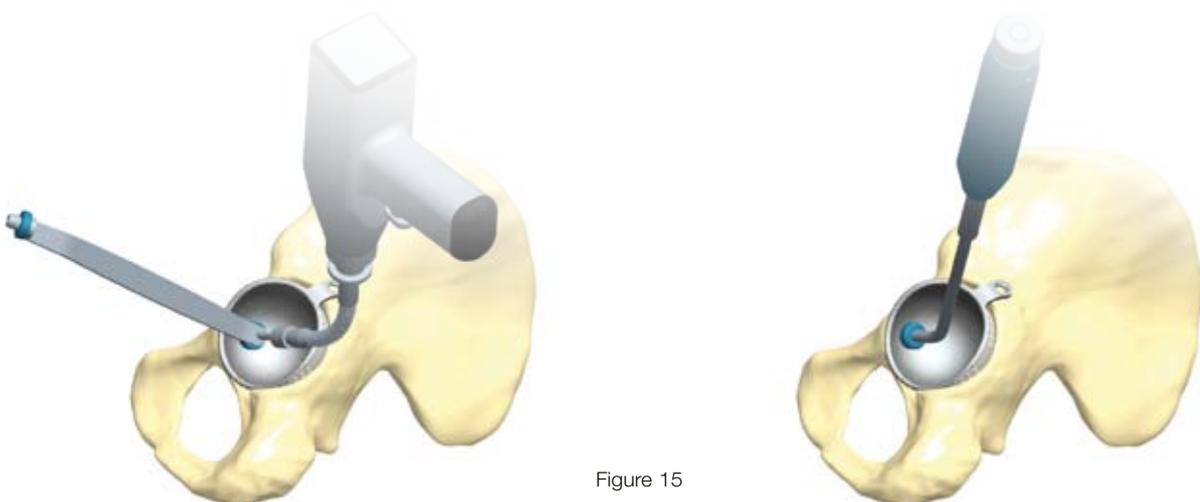


Figure 15

Introduce the peg with the peg clamp. Gently impact the peg into its final position with the straight or curved peg impactor (Figure 16).

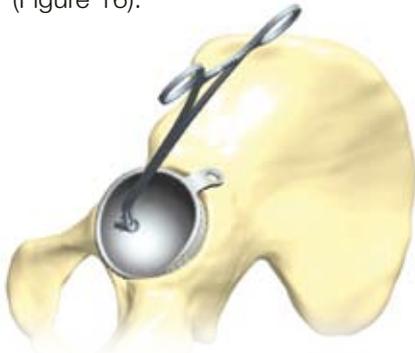


Figure 16

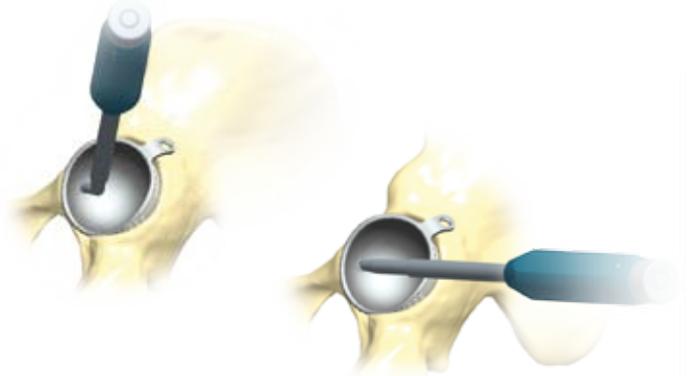


Figure 17

Ensure that the pegs are sufficiently inserted and do not protrude nor disturb the insert mobility (Figure 17).

Screw position and reduction

Cortical screw positioning (4.5mm diameter).

Drill the superior rim of the acetabulum with the long 3.2mm diameter drill through the drill guide (Figure 18).

Measure the screw length with the depth gauge.

Insert the 4.5mm screw and tighten it firmly with the screwdriver (Figure 19).

Assemble the definitive femoral head and poly insert and reduce the joint as shown page 7 (Figure 20).

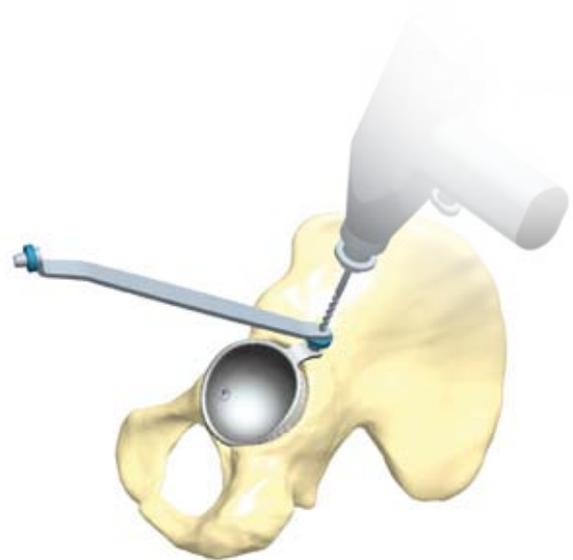


Figure 18

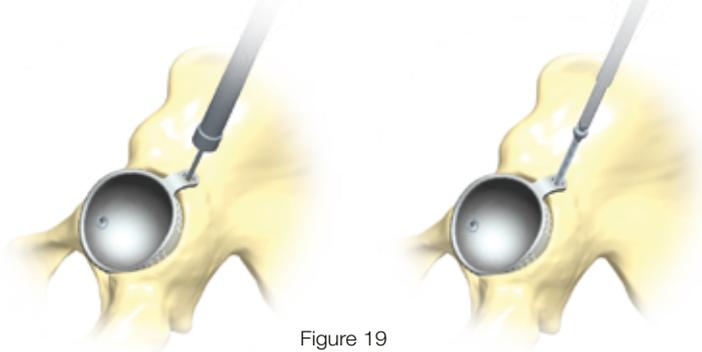


Figure 19

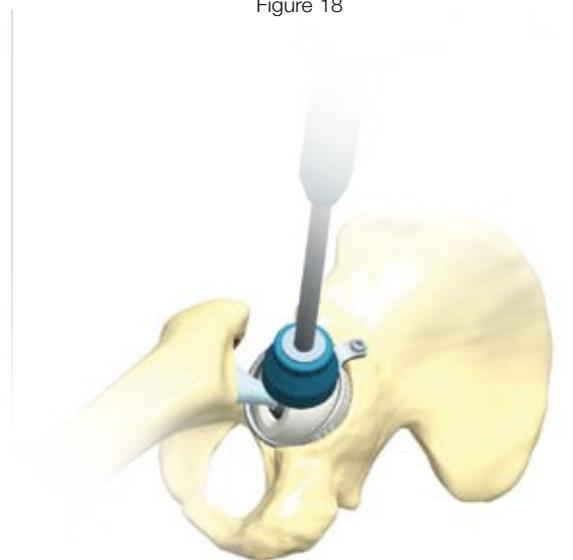


Figure 20

Cemented Cup

When using the cemented cup, it is important to note the operative technique differs to the cementless version.

To select the final implant size, it is recommended to choose a cup smaller than the trial cup in order to allow a minimal cement mantle around the implant.

The final implant and impaction device assembly remains unchanged. However, the impaction tip should be one size smaller than that of the final cup.



Example	
Reamer	= 54mm
Trial cup	= 54mm
Definitive implant	= 52mm
Impaction tip	= 50mm

After cementing of the reamed acetabulum, the cemented AVANTAGE® cup is positioned and inserted as shown page 5 (Figure 21).

Release and remove the impaction tip without waiting for the cement to become hard (Figure 22).



Figure 21



Figure 22



Figure 23



Figure 24

Pressurise the implant until the cement hardens using the final impactor (Figure 23).

During cement pressurisation, remove the surplus of cement from around the implant (Figure 24).

Carry out the trial reduction to assess leg length and joint stability.

Assemble and insert the definitive femoral head, then reduce the joint as shown page 7 (Figure 25).



Figure 25

Revision Cup

Impaction

Impaction of the AVANTAGE® Revision cup assembly is achieved in a similar fashion to the AVANTAGE® RELOAD cup.

When using a Revision cup, the superior rim laser mark is replaced with the superior plate.

Prior to impaction, it is necessary to bend the superior and the posterior plates so that they fit the anatomy of the acetabulum.

Use the bending iron whilst securely holding the cup (Figure 26).

Position the inferior obturator hook, then orient and impact the implant in the same fashion as described page 5 (Figure 27).

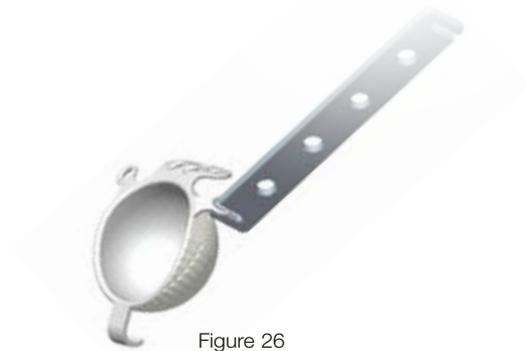


Figure 26

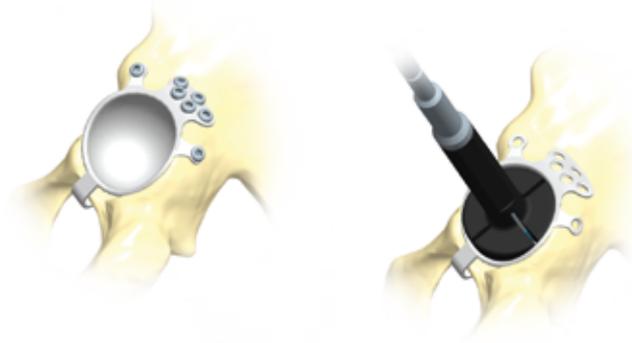


Figure 27

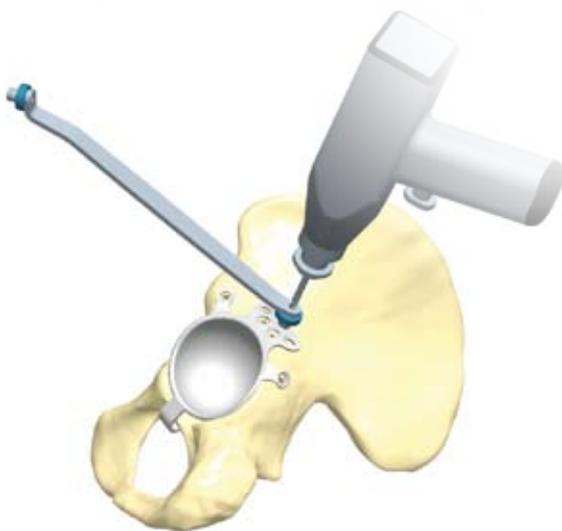


Figure 28

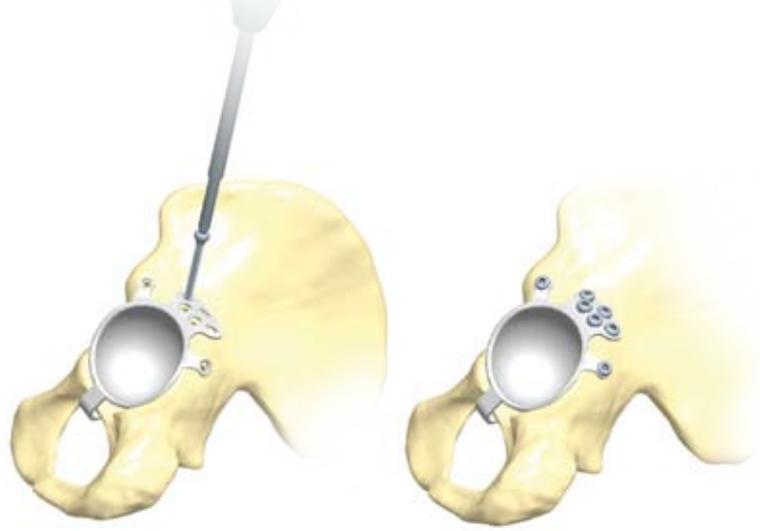


Figure 29

Screw positioning and reduction

4.5mm cortical screw positioning.

Drill using the long 3.2mm diameter drill and the drill guide; you can insert 5 screws through the superior plate and one through the posterior plate (Figure 28).

Measure the screw length with the depth gauge.

Thread the screws and firmly tighten them with the screw driver (Figure 29).

Assemble the definitive femoral head & insert, then reduce the joint as shown page 7 (Figure 30).

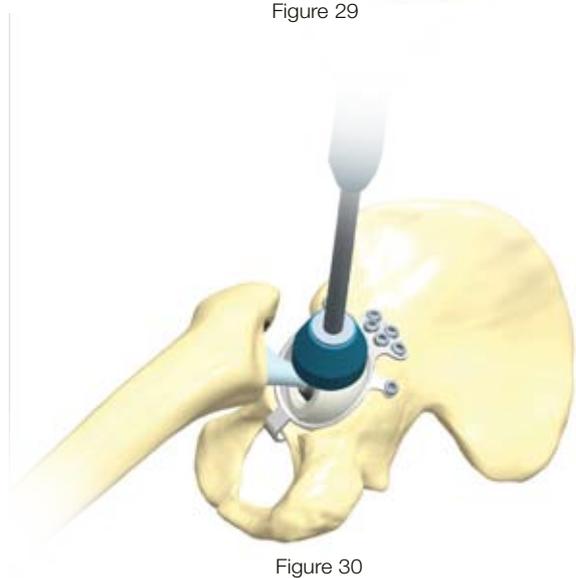


Figure 30

Reconstruction System

Positioning and reduction

The cemented cup combined with the reinforcement plate enables the reconstruction of the acetabulum.

Position the obturator hook of the reinforcement plate and impact the plate (Figure 31).

4.5mm cortical screw positioning.

Drill using the long 3.2mm diameter drill and the drill guide; 4 screws can be implanted through the superior part of the reinforcement plate (Figure 32).

Cement and pressurise the AVANTAGE® cemented cup using the same operative technique described page 10 (Figure 33).

Carry out the trial reduction to assess leg length and joint stability.

Assemble the definitive femoral head and insert, then reduce the joint as shown page 7 (Figure 34).



Figure 31

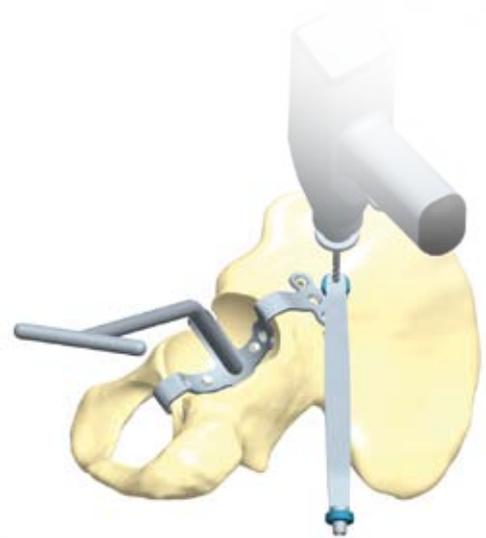


Figure 32



Figure 33



Figure 34

Removal of the Insert

In revision cases, the polyethylene insert can be disassembled from the femoral head.

ATTENTION!

The removed insert must not be re-implanted.

Adjust the jaws of the insert extractor around the insert. Close the jaws tightly onto the insert, making sure the sharp pin penetrates the insert and that the femoral head is securely attached to the femoral stem (Figure 35).

Lever the handle of the insert extractor to disassemble the insert from the femoral head (Figure 36).

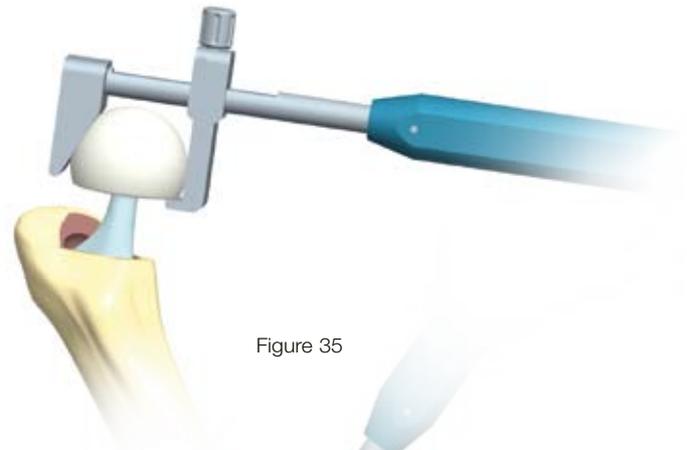


Figure 35



Figure 36

Removal of 3P Pegs

In revision cases, the pegs can be removed by threading the tip of the peg extractor inside the pegs (Figure 37).



Figure 37

AVANTAGE® Acetabulum System

Implants References

Product	Reference	Description	Size
	P0460P44	AVANTAGE® RELOAD Acetabular Cup Cementless	44
	P0460P46		46
	P0460P48		48
	P0460P50		50
	P0460P52		52
	P0460P54		54
	P0460P56		56
	P0460P58		58
	P0460P60		60
	P0460P62		62
	P0460P64		64
	P0461044	AVANTAGE® 3P Acetabular Cup Cementless	44
	P0461046		46
	P0461048		48
	P0461050		50
	P0461052		52
	P0461054		54
	P0461056		56
	P0461058		58
	P0461060		60
	P0461062		62
	P0461064		64
	P0461070	AVANTAGE® Peg	
	P0463044	AVANTAGE® Cemented Acetabular Cup	44
	P0463046		46
	P0463048		48
	P0463050		50
	P0463052		52
	P0463054		54
	P0463056		56
	P0463058		58
	P0463060		60
	P0464454	AVANTAGE® Reinforcement Plate	44-54
	P0464858		48-58
	P0465262		52-62
	P0465666		56-66
	P0464H48	AVANTAGE® Revision Cup	48
	P0464H52		52
	P0464H54		54
	P0464H56		56
	P0464H58		58
	P0464H62		62
	P0464H66		66

Product	Reference	Description	Size
	P0560044	AVANTAGE® Insert Ø 22.2mm	44
	P0560046		46
	P0560048		48
	P0560050		50
	P0560052		52
	P0560054		54
	P0560056		56
	P0560058		58
	P0560060		60
	P0560062		62
	P0560064		64
	P0560066		66
	P0561050	AVANTAGE® Insert Ø 28mm	50
	P0561052		52
	P0561054		54
	P0561056		56
	P0561058		58
	P0561060		60
	P0561062		62
	P0561064		64
P0561066	66		
	P0560E44	AVANTAGE® Insert E1™ Ø 22.2mm	44
	P0560E46		46
	P0560E48		48
	P0560E50		50
	P0560E52		52
	P0560E54		54
	P0560E56		56
	P0560E58		58
	P0560E60		60
	P0560E62		62
	P0560E64		64
	P0560E66		66
	P0561E50	AVANTAGE® Insert E1™ Ø 28mm	50
	P0561E52		52
	P0561E54		54
	P0561E56		56
	P0561E58		58
	P0561E60		60
	P0561E62		62
	P0561E64		64
P0561E66	66		

AVANTAGE® Acetabulum System

Implants References

Product	Reference	Description	Size
	P0606020	AVANTAGE® Ø 4.5mm Screw	20
	P0606022		22
	P0606024		24
	P0606026		26
	P0606028		28
	P0606030		30
	P0606032		32
	P0606034		34
	P0606036		36
	P0606038		38
	P0606040		40
	P0606042		42
	P0606044		44
	P0606046		46
	P0606048		48
	P0606050		50
	P0606052		52
	P0606054		54
	P0606056		56
	P0606058		58
P0606060	60		
P0606062	62		
P0606064	64		

Instrumentation References

A0900046	AVANTAGE® Instrumentation
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Product	Reference	Description	Size
	A4610044	AVANTAGE® Trial Cup	44
	A4610046		46
	A4610048		48
	A4610050		50
	A4610052		52
	A4610054		54
	A4610056		56
	A4610058		58
	A4610060		60
	A4610062		62
	A4610064		64
	A4620044	AVANTAGE® Trial Insert Ø 22mm	44
	A4620046		46
	A4620048		48
	A4620050		50
	A4620052		52
	A4620054		54
	A4620056		56
	A4620058		58
	A4620060		60
	A4620062		62
	A4620064		64
	A4630050	AVANTAGE® Trial Insert Ø 28mm	50
	A4630052		52
	A4630054		54
	A4630056		56
	A4630058		58
	A4630060		60
	A4630062		62
	A4630064		64
	A4640044	AVANTAGE® Impactor Tip	44
	A4640046		46
	A4640048		48
	A4640050		50
	A4640052		52
	A4640054		54
	A4640056		56
	A4640058		58
	A4640060		60
	A4640062		62
	A4640064		64
	A4650001	AVANTAGE® Cup Impaction Handle	
	A4650002	AVANTAGE® Expanding Rod	
	A4650004	AVANTAGE® Peg Shaper	
	A4650019	AVANTAGE® Drill Guide	
	A0208002	Twist Drill Ø 3.5mm Long	70
	A4650020	Small Drill Ø 3.5mm	35

AVANTAGE® Acetabulum System

Instrumentation References

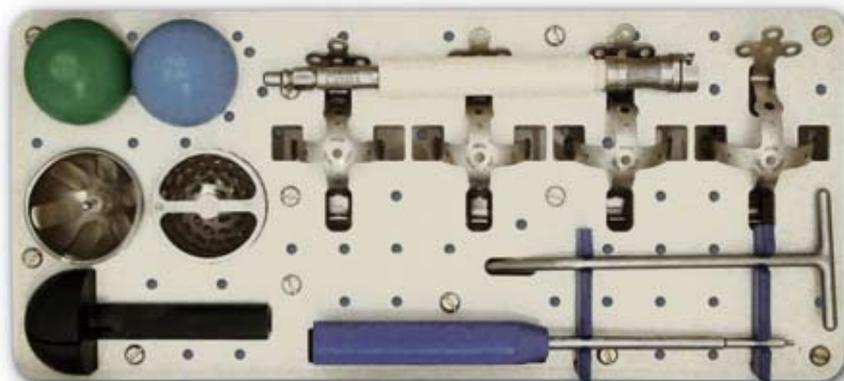
Product	Reference	Description	Size
	A0208004	Drill Flexible Shaft	
	A4650008	Straight Peg Inserter	
	A4650009	Curved Peg Inserter	
	A4650010	Peg Clamp	
	A4650012	Insert Extractor	
	A4650014	Peg Extractor	
	A0310074	Plate Bender	
	A4650013	AVANTAGE® Trial Cup Positioner	
	A4650011	AVANTAGE® Insert Press	
	A4650015	AVANTAGE® Final Orientation/Impaction Tip	
	A4650016	AVANTAGE® Head/Liner Pusher Tip	
	A4650024	AVANTAGE® Cup Positioner V3	
	A4650017	AVANTAGE® Impaction Handle	L. 250
	A0207007	ALIZE® 45° Angulation Guide Rod	
	A0305003	Drill	Ø 3.2
	A4650071	Long Screwdriver	H. 3.5
	MJP310010	Depth Gauge for Acetabular Screws	
	31-100644	Concept Grater Reamer	44
	31-100646		46
	31-100648		48
	31-100650		50
	31-100652		52
	31-100654		54
	31-100656		56
	31-100658		58
	31-100660		60
	31-100662		62
31-100664	64		
	31-100637-3	Modified AO Reamer Handle 9" V.3	

AVANTAGE® Acetabulum System

Revision Complement Instrumentation References

A0900067	AVANTAGE® Revision Complement Instrumentation
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Product	Reference	Description	Size
	A4654454	AVANTAGE® Trial Revision Cage	44/54
	A4654858		48/58
	A4655262		52/62
	A4655666		56/66
	A4610066	AVANTAGE® Trial Cup	66
	A4620066	AVANTAGE® Trial Insert Ø 22mm	66
	A4630066	AVANTAGE® Trial Insert Ø 28mm	66
	A4640066	AVANTAGE® Impactor Tip	66
	3542.300	CMK3 Trial Cup Pusher	
	31-100637-3	Modified AO Reamer Handle 9" V.3	
	31-100666	Concept Grater Reamer	66



A4650101 AVANTAGE® Revision Tray Only

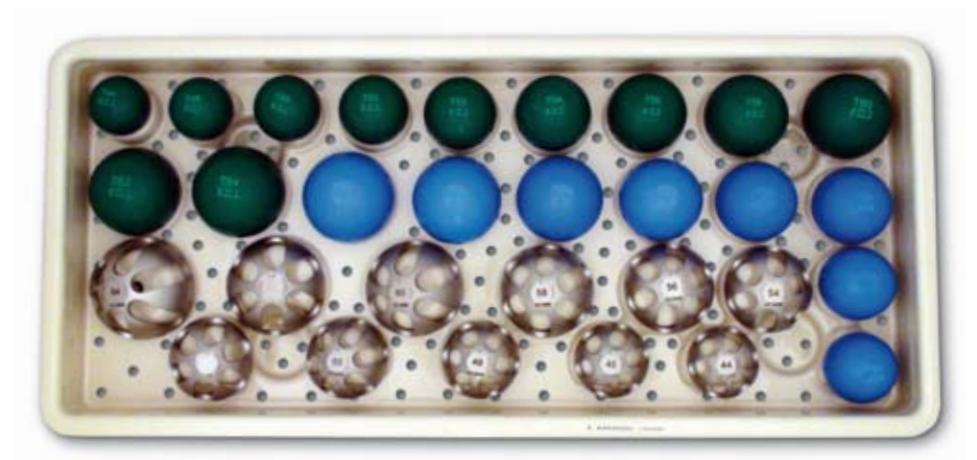
Reference	Description
A4650102	AVANTAGE® Revision Tray Lid
E01C0013	Cont 600 x 300 x 110 Alu 1F Ref B037

AVANTAGE® Acetabulum System

Tray References



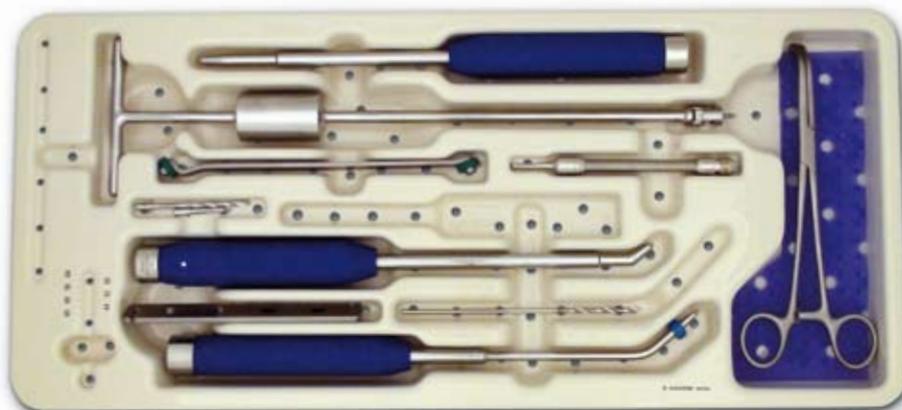
A4650090 AVANTAGE® Primary Instr Tray 1 Only



A4650092 AVANTAGE® Primary Instr Tray 2 Only



A4650094 AVANTAGE® Primary Instr Tray 3 Only



A4650096 AVANTAGE® Primary Instr Tray 4 Only



A4650098 Acetabular Reamers Case

Reference	Description
A4650091	AVANTAGE® Primary Instr Tray 1 Lid
A4650093	AVANTAGE® Primary Instr Tray 2 Lid
A4650095	AVANTAGE® Primary Instr Tray 3 Lid
A4650097	AVANTAGE® Primary Instr Tray 4 Lid
A4650099	Acetabular Reamers Case Cover
E01C0022	Cont 600 x 300 x 210 Alu 1F Ref B039
E01C0013	Cont 600 x 300 x 110 Alu 1F Ref B037



AVANTAGE® trademark belongs to BIOMET France.

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