

GRIPTION[®] TF

Acetabular Revision Solutions

Surgical Technique

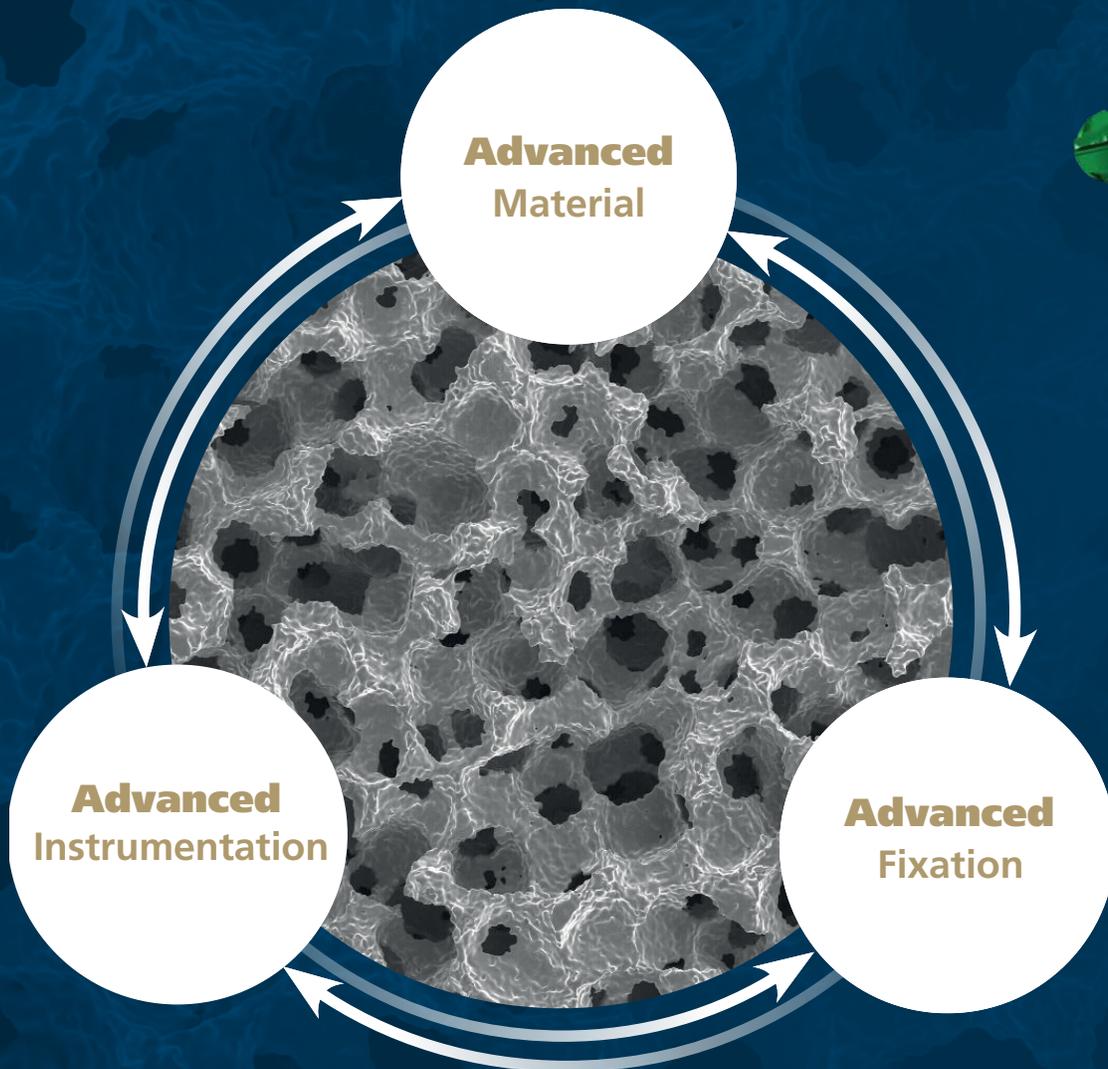


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GRIPTION® TF Acetabular System

Filling the gap in acetabular revision surgery

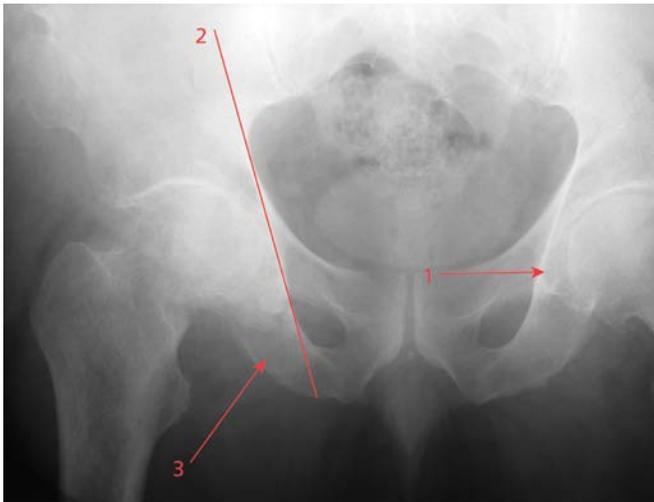


Revision Solutions



GRIPTION TF Surgical Technique

Radiographic landmarks



Radiographic landmarks can be helpful in assessing the acetabular bone stock. It can also be useful to order a CT scan of the area with a metal suppression technique. Ordering a CT scan of the area with a metal suppression technique can also be useful.

Anatomic landmarks

1. Acetabular teardrop – integrity of medial wall and inferior portion of anterior and posterior column
2. Kohler's line – integrity of medial wall and superior anterior column
3. Ischial lysis – integrity of posterior wall and posterior column

Bone Stock Considerations

Completely supportive acetabulum:

PINNACLE Hip Solutions Shell

Partially supportive acetabulum:

PINNACLE Hip Solutions Shell
with GRIPTION TF Augments

Non-Supportive acetabulum:

PINNACLE Hip Solutions Shell with possible need for
Augment, Buttress or Cage

Pre-operative Planning and Templating

Using the standard DePuy Synthes Companies PINNACLE Acetabular Shell Templates, the surgeon can determine the approximate size of the revision shell that may be required, including the possibility of jumbo shells (>66 mm diameter), deep profile shells, or acetabular Augments. Assessing the acetabular bone stock is of great importance in helping the surgeon to anticipate the possible structural defects that may be encountered during the surgery.

Shell OD	Augment ID	Buttress ID
50, 52	50 mm	56 mm
54, 56	54 mm	56mm
58, 60	58 mm	62mm
62, 64	62 mm	62 mm
66, 68	66 mm	68 mm
70, 72	70 mm	68mm

Augment Acetabular Preparation

Once the acetabulum has been exposed and evaluated, preparation for the acetabular construct can begin. Start by reaming the acetabulum with an undersized reamer at a level that will restore the appropriate center of rotation. Ream concentrically with progressively larger reamers – maintaining appropriate opening abduction and anteversion. Reaming should stop when adequate rim contact (this is dictated by the anterior posterior dimensions of the socket) has been obtained excluding the defect region.

At this point, the surgeon has 2 options for preparing the acetabular defect to accept the GRIPTION TF Augment:

- Finishing Rasp (most utilized option)
- Modular Rasp

Tip: Occasionally there could be sclerotic bone hindering seating of rasp. If this is the case a high speed burr could be utilized to finalize.



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Augment Acetabular Preparation

Finishing Rasp Technique

Once the acetabular cavity has been prepared, place the shell trial into the prepared bed at the correct center of rotation.

Choose the appropriately sized finishing rasp that corresponds with your PINNACLE Shell. Start preparing the acetabular defect by keeping the inside diameter of the finishing rasp against the outer surface of the acetabular trial. Rasps should only be utilized over the shell trial and not over the final shell implant.

Note: Take care to confirm that the connections for the Strike Plate-Handle and Power Adapter-Handle have been fully engaged. The button feature will return to its original height and an audible clicking noise will be apparent. Rasps can be used with Stryker® Reciprocating Power.

Advance the rasp slowly until the desired seating level is obtained. The rasp sizes directly match the corresponding augment trial and final implant. These rasps can be used to judge the seating of the actual implant. If it appears that there is not intimate bone contact with the rasp, increasing to the next thickness of rasp may be necessary, repeating the steps above until adequate bone contact has been obtained. Once the defect has been prepared satisfactorily, tap the appropriate GRIPTION TF Augment Trial into place.

If the trial is stable, then the defect is appropriately prepared. If adequate bone contact is not obtained, or the trial is not stable, further preparation with larger rasps may be needed.

Tip: For improved stability when rasping, use the adjustable handle (2217-01-500). Further stability may be achieved by using screws or headed drill pins in the trial shell. Placement of the screws or headed drill pins should be considered. Select holes so that the screws or pins will lie within the safe quadrant. The safe quadrant is defined by two lines from the anterior-inferior iliac spine through the center of the acetabulum and posterior by a line from the sciatic notch to the center of the acetabulum.

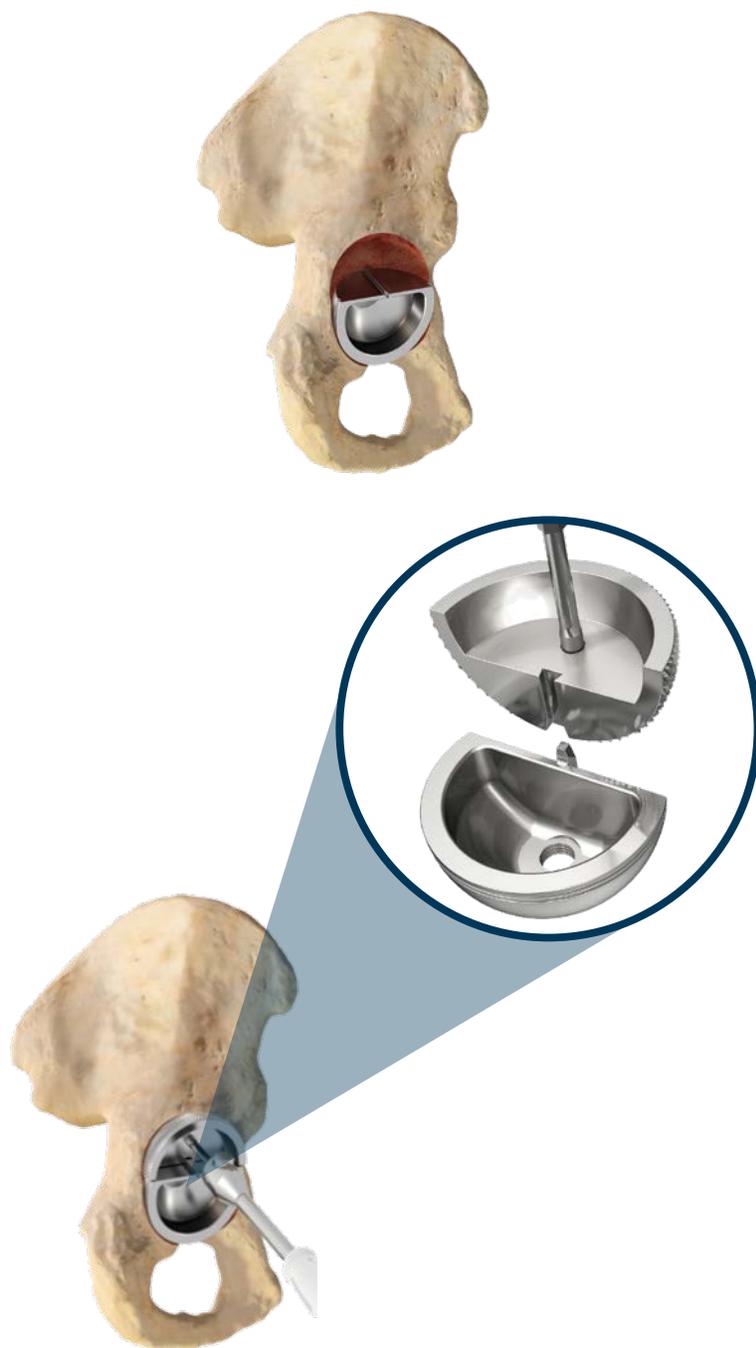


Tip: Use the threaded headed pins to stabilize the augment trial.

Modular Rasp Technique

Once the acetabular cavity has been prepared, utilize the half shell trial that is undersized by 1 mm from the last reamer or acetabular trial that was used. Place the trial in the prepared acetabular cavity at the correct center of rotation. Attach the modular rasp to the dovetail of the trial and advance the construct so that the rasp will prepare the defect appropriately. Starting with the smallest size rasp, prepare the defect utilizing progressively larger rasps until the defect has been satisfactorily prepared to accept the appropriate size Augment. Rasps can be used on power with the Stryker Rasping Power Adaptor (2217-01-517), or can be used by hand utilizing the Rasping Strike Plate (2217-01-516). Remove the half shell trial and insert the appropriate full hemispherical acetabular trial. The GRIPTION TF Augment Trial can now be placed into the defect and can be tapped into place. If the trial is stable, the defect is appropriately prepared. If adequate bone contact is not realized or the trial is not stable, then further preparation with larger rasps may be needed.

Once appropriate stability has been obtained for the Augment trial, the definitive Augment is ready to be placed.



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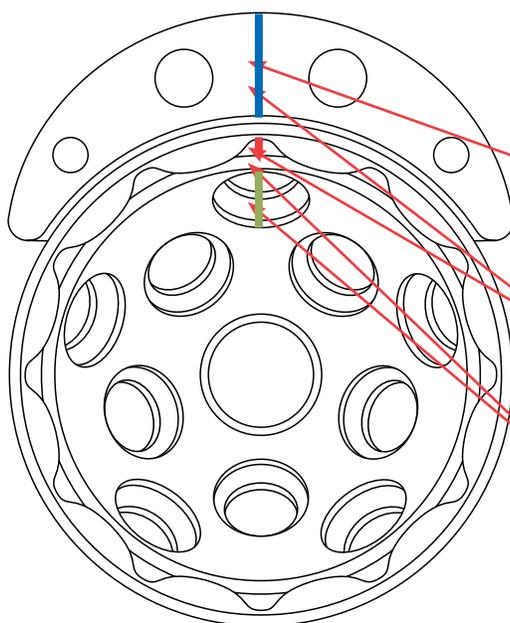
Augment Insertion

Once the acetabulum and acetabular defect have been prepared to accept the acetabular shell and augment, the surgeon can decide to first place the acetabular shell and then the augment, or first place the augment and then the shell. Placing the acetabular shell prior to the augment limits access to the screw holes on the inner diameter of the augment. In addition, at the time of insertion of the shell and Augment, the surgeon should decide whether cement fixation or mechanical fixation will be utilized to attach the Augment to the acetabular shell.

Acetabular Shell-First Technique

After preparation of the acetabulum and accompanying defect has been completed, insert the acetabular shell in accordance with the PINNACLE Acetabular Shell System technique.

Note: Acetabular shells should be placed at a targeted 35-45 degrees of abduction and 15-20 degrees of anteversion based on individual patient needs and pre-op planning.



The augment can be marked with a line in the center to represent the center of the slot

Align the Anti-Rotational Device (ARD) with the center line of the augment while impacting the shell, and the slot will line up with the screw hole.

Use an ARD whose center aligns with the center of a screw hole. May be helpful to mark this ARD with a pen.

Acetabular Shell-First Technique (Continued)

A 6.5 mm PINNACLE Bone Screw may be placed at this point. The surgeon should pay close attention to any shift in position of the shell that may occur secondary to placing and tightening down the screws. If the shell requires placement of the Augment to provide stability of the construct, tightening the screws before placing the Augment may shift the shell slightly. This may cause difficulty in placing the Augment if the acetabular defect has been prepared in a precise manner. If a shift in position of the acetabular shell is noted, the screws should be backed out slightly to allow the appropriate placement of the Augment and then re-tighten. If the shell is stable without initial screw fixation the 6.5 mm PINNACLE Bone Screw can be placed after the Augment has been inserted.

Drill Bits	Screws
3.8 drill bit	6.5 mm Pinnacle Bone Screws
	5.5 mm Locking Screws
3.2 drill bit	5.0 mm Non-Locking Screws

Once the acetabular shell is in place, if Cemented or Hybrid fixation is desired, place a bead of doughy cement on the outer surface of the shell prior to placing the Augment.

The Augment inserter tip should be placed on the flat surface of the Augment in the two center holes. The Augment can then be tapped into place behind the acetabular shell and into the prepared defect.



GRIPTION TF Acetabular Revision System Surgical Technique

Augment Insertion

Acetabular Shell-First Technique (Continued)

Screw fixation of the Augment can then be performed using the 5.5 mm locking or 5.0 mm non-locking screws. The Threaded Headed pins can be used to help stabilize the Augment during screw insertion if necessary.

Alternatively, the surgical assistant can stabilize the Augment with the inserter tip until screw fixation is obtained.

Cementless Option:

If TRUEBOND Cementless Technology fixation is desired, a standard PINNACLE 6.5 mm Bone Screw can be placed through the shell and fixation slot of the Augment. Special care should be taken to ensure that the head of the screw is fully seated within the acetabular shell.

Tip: • Care should be taken to ensure that the PINNACLE Screw used to attach the augment to the cup does not extend beyond the augment into bone. If the screw extends past the augment and into bone then there is the potential to create a gap between the shell and augment.

- Use the 3.8 drill bit for the 6.5 mm cancellous screws.
- Use the 3.8 drill bit for the 5.5 mm locking screws.
- Use the 3.2 drill bit (in the PINNACLE Revision System) for the 5.0 mm non-locking screws.



Augment-First Technique

Following preparation of the acetabulum and accompanying defect, place the acetabular augment. Utilize the 90-degree inserter tip on the inside diameter of the Augment. The Augment can now be impacted into the defect or held in place with the inserter. Insert the threaded, headed pins through the holes in the flat face of the Augment to provide provisional fixation.

Screw fixation utilizing either 5.5 mm locking or 5.0 mm non-locking screws can now be performed. **On the inside diameter of the Augment, only 5.5 mm locking screws can be utilized.** Special care should be taken to ensure that the screw heads are fully seated and flush when utilizing the inner diameter fixation holes.

- Note:**
- **Do not attempt screw fixation through the center TRUEBOND Slot directly into bone.**
 - **Do not drill into the augment to alter the shape or add additional screw holes.**
 - **Do not attempt screw fixation in the outer periphery of the 10 mm thick augments. These are to be used for pin fixation only.**
 - **Utilize either the straight or 45-degree drills on the inner diameter screw holes**



GRIPTION TF Acetabular Revision System Surgical Technique

Augment Insertion

Augment-First Technique (Continued)

Cemented Option:

If the cemented fixation option is desired, a bead of doughy cement can now be placed on the inner diameter of the Augment and the acetabular shell can be impacted in the standard fashion. A 6.5 mm PINNACLE Bone Screw can now be used for acetabular shell fixation.

Hybrid Option:

If the hybrid fixation option will be utilized, the shell should be carefully positioned during impaction so that the fixation slot of the Augment lines up with an appropriate dome hole in the Acetabular Shell. The shell should be impacted utilizing the standard PINNACLE Acetabular Shell surgical technique. Once the shell is in position, screw fixation of the shell can be carried out. An additional 6.5 mm PINNACLE Bone Screw may be placed through the appropriate dome hole in the shell and through the fixation slot in the Augment. Special care should be taken to ensure that this screw head is fully seated within the inside diameter of the shell.

Tip: Bone wax on the tip of the inserter may assist holding the Augment on the inserter device (optional).



Buttress and Shim Insertion

In some cases, the acetabular defect will require a Buttress rather than an Augment in order to provide the appropriate stabilization of the construct. Once this has been determined, exposure of the iliac wing is required. Care should be taken to avoid disruption of the vascular structures within this area. In most cases a large elevator can be used to subperiosteally elevate the abductor musculature from the ilium to adequately allow placement of the Buttress in the correct position. In cases where exposure is difficult, it may be necessary to perform some type of trochanteric osteotomy, trochanteric slide, or a variant thereof, to aid in exposure of the iliac wing in the supra-acetabular area.

Once exposure is achieved, similar to the acetabular preparation of the Augment, the acetabulum should be reamed to the desired diameter. At this point, if the defect needs additional preparation for the Buttress Implant, utilize the GRIPTION TF Acetabular Revision System rasps in the same manner as the Augments, or a high speed burr. Care should be taken to ensure only necessary bone is removed to prepare the cavity for the Buttress. Next, a hemispherical cup trial should be inserted, to trial alongside the corresponding Buttress trial. Different Buttress trials should be evaluated to see which orientation (Left, Right or Neutral) can best address the defect.

Since pelvic geometries can differ, Shims may be required to help position the construct as well as raise and angulate the Buttress. In the event a Shim is required, trial this alongside the appropriate Buttress. The Shim trials come in three angle options, a 5°, 10°, and 15° and can be oriented in 90 degree increments, which snaps onto the Buttress trial for ease of use.



Tip: Select screws that are longer than the combined thickness of the Buttress and Shim. Care should be taken to not perforate the pelvis.

GRIPTION TF Acetabular Revision System Surgical Technique

Buttress and Shim Insertion

Acetabular Shell-First Technique

Once the appropriate position of the Buttress has been determined, the surgeon has the choice of which to implant first: The PINNACLE Shell or the Buttress. If the acetabular shell is placed first, it is impacted in the standard fashion and supplemental screw fixation is utilized at this time. If only a Buttress is to be used, a bead of cement should now be placed on the surface of the PINNACLE Shell which will contact the inner diameter of the Buttress. Supplemental screw fixation with the GRIPTION TF Locking Screws, 5.0 mm Peripheral Screws and/or the PINNACLE Bone Screws should be used at this time. It is recommended to use at least 2 screws if possible for stabilization.

In the event a Shim is also used, after impacting the PINNACLE Shell, cement the Shim and the Buttress together outside the wound. Care should be taken to ensure there is no cement left in between the screw holes, and that the Shim is positioned in the same manner as when trialing. Once the cement has cured, continue the same steps as mentioned above, by adding a bead of cement to the PINNACLE Shell to insert the Buttress and/or Shim.

Note: In the event a Shim is used, cement the flat side which has the etching, to the underside of the Buttress.

The Buttress construct can then be placed and held in position with the knurled, threaded guide pins while screw fixation is being performed, or alternately it can be held manually. PINNACLE 6.5 mm Bone Screws are used in the two distal holes of the Buttress, closest to the inner diameter. These screw holes allow for slight divergent placement to aid in stability and fixation. GRIPTION TF 5.5 mm Locking Screws or the 5.0 mm Peripheral Non-Locking Screws can be used in the proximal four holes of the Buttress. Care should be taken when inserting the screws into the Buttress plate to avoid potential neurovascular injury.

Note: It is recommended to use at least two screws out of the six possible screw holes if bone allows. See the Screw Options Chart in this Surgical Technique for guidance.



Buttress and Shim First Technique

After the acetabulum is reamed to the desired diameter place the corresponding acetabular shell trial in place. Next, trial the defect using the Buttress and/or Shim trials to best address the defect, in a similar manner described above. At this point, secure the acetabular trial in place using either the angled handle along with an assistant to hold it, or angling the headed pins to keep the shell trial in place.

To insert the Buttress implant based on the trial that has been completed, slide this into place against the shell trial, and secure the implant with the headed threaded pins while supplemental screw fixation is taking place. Care should be taken when inserting screws to avoid neurovascular injury.

Once the Buttress is secure, remove the acetabular shell trial and add a bead of cement to the inner diameter of the Buttress. Insert the final PINNACLE Shell into the acetabulum and utilize screw fixation at this time. Care should be taken to ensure the Buttress construct has not moved once the PINNACLE Cup has been inserted.



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