

# Trabecular Metal™ Acetabular Revision System (TMARS)

Buttress and Shim Augments

Surgical Technique





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## A Viable Alternative to Structural Allograft

- The Trabecular Metal Straight Buttress and Column Buttress Augments provide superior structural support to the acetabular shell as an alternative to preparing and using structural allograft.
- Trabecular Metal Shim Augments provide the ability to optimize the fit of either buttress device to host bone.
- The buttress augment and Trabecular Metal Revision Shell construct provide a solution for addressing Paprosky Type IIIA superior segmental and/or cavitary defects without custom implants or bulk allografts.
- The buttress augment shape is comparable to a “Figure 7” distal femoral allograft, without the potential for resorption, loss of structural integrity or disease transmission.
- Host bone is conserved while the buttress augment provides structural support for more natural implant positioning and orientation.
- Acetabular shell position and patient kinematics remain uncompromised.
- Sizing options allow usage of buttress augments with any Trabecular Metal Revision Shell.



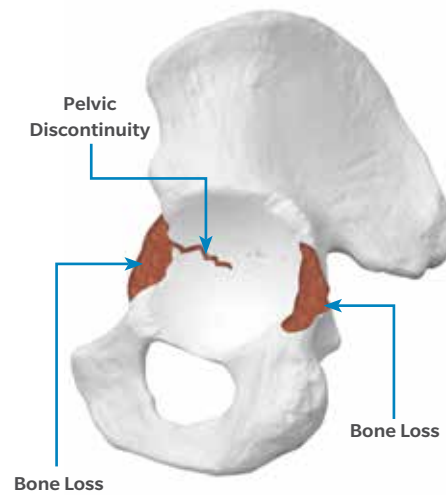


Figure 1



Figure 2

## Preoperative Planning

The Paprosky Defect Classification is based on the severity of bone loss and the ability to obtain cementless fixation for a given bone loss pattern.<sup>1</sup> In this classification system, a Type-III A defect is described as an acetabulum that will not provide adequate initial component stability to achieve reliable biological fixation. Preoperative radiographs show superior and lateral migration of the component greater than 3 cm above the obturator line (with adjustment for magnification).<sup>2</sup> The remaining acetabular rim will not provide initial structural support for the acetabular shell. Support of the implant with a structural augment is necessary in the short term to provide initial stability and thus allow ingrowth in contact with the host bone.<sup>1</sup> Augments also restore the center of rotation to the proper anatomic location.

## Acetabulum Assessment and Preparation

Carefully assess any acetabular bone defects intraoperatively, noting the location, extent and defect type. Also, assess the quality and location of the host bone that remains for support of the acetabular reconstruction (Figure 1).

Identify the hip center and use progressively larger reamers to size and shape the acetabulum for the Trabecular Metal Revision Shell (Figure 2). Hold the reamer steady in the intended position and orientation in which the shell will be implanted.

Reassess the acetabulum to evaluate the quality of bone and defect type. Determine which Trabecular Metal components will be used to reconstruct the acetabulum. If a medial wall Trabecular Metal Acetabular Restrictor is to be used, it should be placed before the other components. Break out as a Note: Please refer to the TMARS Restrictor and Augment Surgical Technique. Contained defects in the acetabulum may be filled with morselized bone graft.



Figure 3



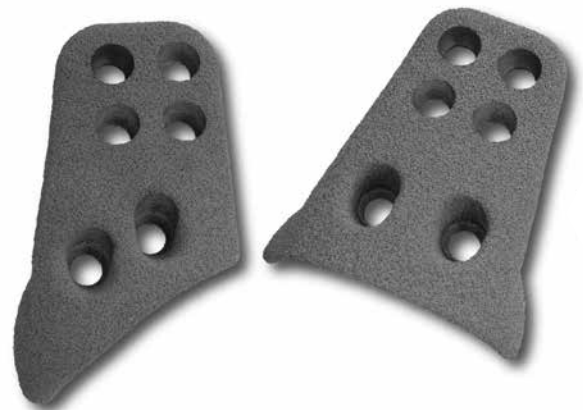
Figure 4

## Choose the Appropriate Component

Insert the selected size Trabecular Metal Revision Shell provisional to determine areas of host bone contact, inherent stability, and the location of the segmental bone loss where the Trabecular Metal Straight Buttress or Column Buttress will be used. Effort should be made to provide for anatomical positioning of the shell.

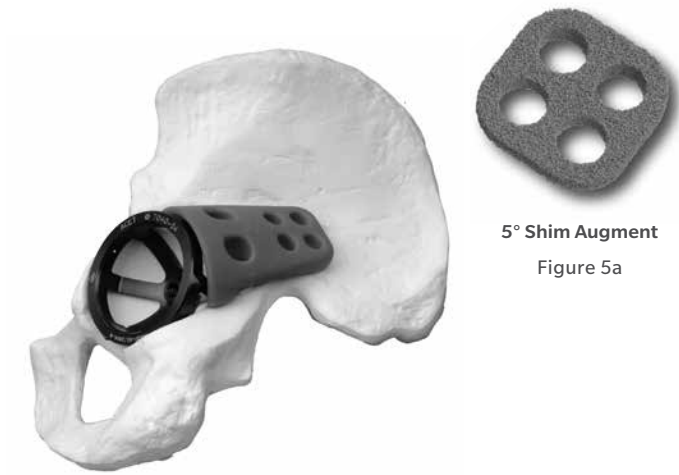
Use the straight buttress and/or column buttress provisionals to determine the size that will best fill the defect. The straight buttress (Figure 3) is available in two sizes: 54 mm and 58 mm. The column buttress (Figure 4) is available in two configurations, Left Posterior/Right Anterior and Right Posterior/Left Anterior, both similar in size to the 54 mm straight buttress. Be sure to use the configuration most appropriate for addressing the column deficiency which is present.

**Note:** Buttress augments should be supported by placing the “step” on the underside of the augment, directly.



Right Posterior/Left Anterior  
Column Buttress Augment

54 mm Straight  
Buttress Augment



5° Shim Augment  
Figure 5a

Figure 5



Figure 6

## Prepare the Bone for the Buttress Augment

With the Trabecular Metal Revision Shell provisional in place, position the straight buttress or column buttress provisional against the ilium (Figure 5). Use a rongeur to remove bone as necessary, being careful to minimize the amount of bone removed. A burr can be used to smooth the surface of the defect to facilitate stable placement and optimize the fit of the buttress augment.

Use a depth gauge through the screw holes in the flange of the straight buttress or column buttress provisional to assess implant/bone contact. It is important to achieve maximum contact between the buttress augment and the host bone of the ilium. If additional contact is needed, determine the appropriate size Trabecular Metal Shim Augment to achieve appropriate contact (Figure 5a). Place the shim provisional beneath the flange of the buttress augment or column buttress provisional and rotate as needed to obtain optimal component-to-host bone contact (Figure 6). Ensure proper shim and flange screw hole alignment. Note the location of the provisional components.

Remove the provisional components.

**Note:** Maximum host bone contact and bone support are needed to optimize implant performance.



Figure 7



Figure 8

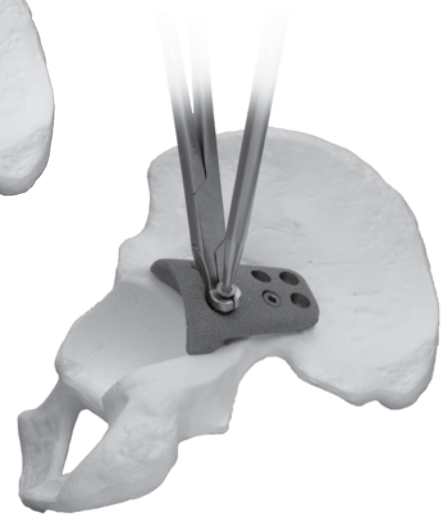


Figure 9

## Implant the Buttress Augment

If using a shim, ensure the orientation of the Shim with respect to the straight buttress or column buttress is the same as it was during trialing. Cement the two components with doughy bone cement on the back table. Care should be taken to prevent cement from extruding into the screw holes on either component (Figure 7).

With the provisional shell in place, fit the augment in the appropriate position on the ilium. Insertion of the implant can be done by hand or with the augment forceps by grasping the two screw holes on the top of the straight buttress or column buttress.

Drill the screw holes through the desired holes in the augment flange to accept 6.5 mm cancellous screws (Figure 8). Screws should be positioned to achieve optimal fixation in the ilium.

Assemble the torque limiter onto the screwdriver.

**Note:** Using the torque limiter prevents advancement of screw heads through the screw holes or stripping of the threads formed in the bone.

To achieve initial fixation, insert 6.5 mm HGP II cancellous screws using the predrilled holes (Figure 9). Ensure careful screw placement to avoid vascular and neurological injury.

Fill any remaining voids with cancellous bone graft. Check the implant and bone graft position by reintroducing the provisional shell.





Figure 10

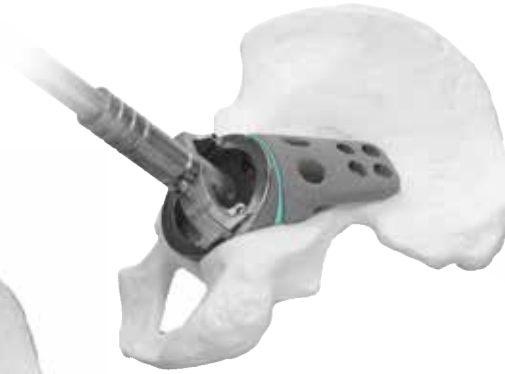


Figure 11



Figure 12

## Implant the Trabecular Metal Revision Shell

Attach the appropriate shell inserter to the rim of the selected acetabular shell. Place doughy bone cement across the concave surface of the buttress augment where it will contact the shell (Figure 10). Take care to limit the cement to this location and prevent cement from extruding onto host bone where it might impede bone ingrowth into the Trabecular Metal Implants.

Insert the Trabecular Metal Revision Shell in proper anatomical orientation prior to cement curing, with screw holes located in the area of ideal host bone fixation (Figure 11). Place bone screws into the acetabular shell being careful to avoid contact between the bone screws and the augment (Figure 12).



Figure 13

### Cement the Acetabular Liner

Cement the liner with doughy bone cement. (Figure. 13). The Revision Shell Liners are available in several head articulation options, including 28, 32, 36, and 40 mm inner diameters.

ⓘ **Note:** Bone wax covering unused screw holes can prevent cement extrusion through the holes and potential interference with bone ingrowth into the Trabecular Metal Revision Shell. Additionally, covering screw heads may aid in screw removal if future revision surgery is needed.



## References

1. Paprosky, W.G., et al. Acetabular Defect Classification and Surgical Reconstruction in Revision Arthroplasty: A 6-year Follow-up Evaluation. *J Arthroplasty Managing*. 9: 33-44, 1994.
2. Sporer, S.M., et al. Managing Bone Loss in Acetabular Revision. *J Bone Joint Surgery*. 87(2): 1620-30, 2005.

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2090.X-GLBL-EN Ordering Information



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TMARS Buttresses  
and Shims

 1639



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