

Lineage[®]

CERAMIC-ON-CERAMIC ACETABULAR CUP SYSTEM

SURGICAL TECHNIQUE



WRIGHT.

LINEAGE[®]
ceramic-on-ceramic
ACETABULAR
CUP SYSTEM

written in conjunction with:

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LINEAGE®
 ceramic-on-ceramic
 acetabular CUP SYSTEM

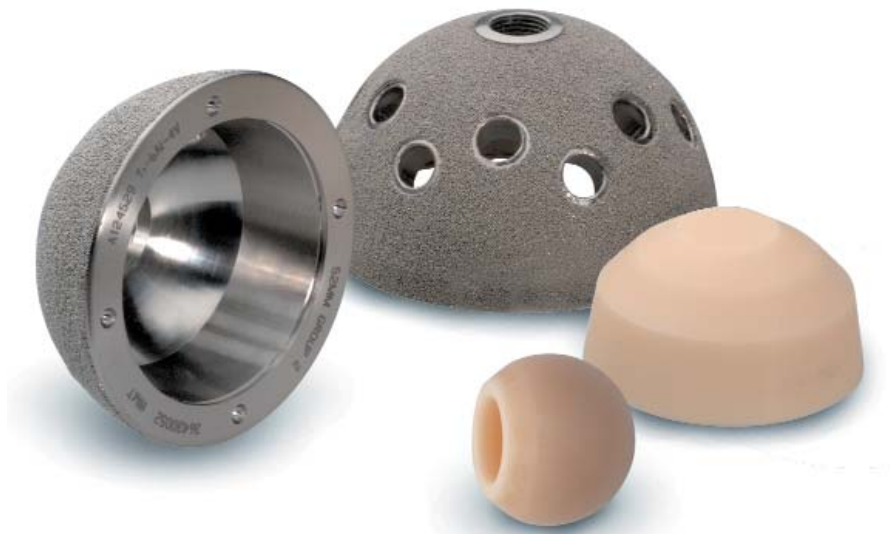
as described by **Stephen Murphy, MD**

Today's orthopaedic surgeons face many challenges with acetabular replacement. As improved mechanical designs, bearing materials and techniques diminish short term failures, the focus has moved to long term survivorship.

The LINEAGE® Acetabular Cup System has integrated several design features to address contemporary issues. Since component wear is one of the biggest challenges in Orthopaedics today the LINEAGE® Acetabular System is designed to allow alumina ceramic, cobalt chrome and polyethylene bearings with or without screw fixation. It is the only acetabular system in the market that can be used with all three bearings within a single cup design. This makes the LINEAGE® Acetabular Cup System the choice for surgeons requiring a wide range of primary, revision and bearing material options.

general PRECAUTIONS

Proper surgical procedures and techniques are the responsibility of the medical professional. Each surgeon must evaluate the appropriateness of the procedure used based on personal medical training and experience. Wright Medical Technology, Inc. cannot recommend a particular surgical technique suitable for all patients.



preoperative EVALUATION

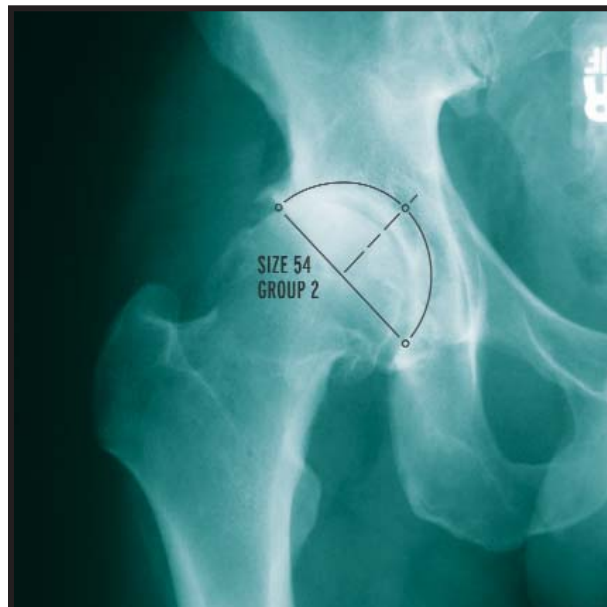
Preoperative assessment of the appropriate size and position of the acetabular component will provide intraoperative guidance for acetabular reaming.

An A/P x-ray of the pelvis will aid in leg length and offset assessment and management. Leg length discrepancies should be determined preoperatively and addressed intraoperatively.

Radiographic overlays for the LINEAGE® Acetabular Cup System are available in 15 and 20 percent magnifications.

To determine the acetabular cup size and position, place the overlay outline at approximately 40° of abduction and with the center of rotation positioned so that adequate bony coverage of the socket is planned. A true lateral or false profile view of the acetabulum can be helpful to accurately predict acetabular component size.

NOTE | The use of a magnification marker will aid in determining the x-ray magnification.



acetabular PREPARATION

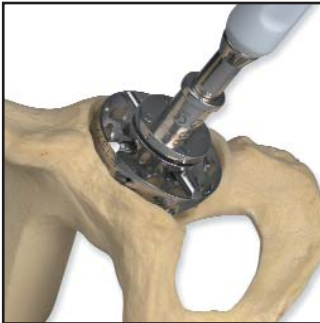


FIGURE 1 |



FIGURE 2 |

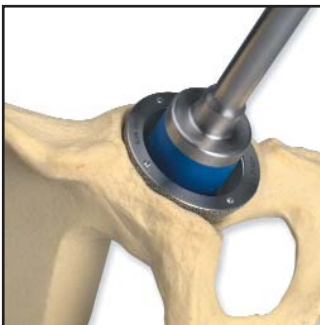


FIGURE 3 |

CAUTION | Preoperative templating is intended for estimation purposes only. Final component size and position should be determined intraoperatively.

Reaming should be sequential. Start with the smallest reamer that conforms to the acetabular cavity. Gradually enlarge the acetabulum by reaming articular cartilage until a continuous surface of bleeding subchondral or cancellous bone is exposed. | **FIGURE 1** Reaming slightly medial may be appropriate for sockets that are affected by medial osteophyte formation.

ACETABULAR COMPONENT SELECTION

Ream the socket to the same diameter as the acetabular shell. With a slightly expanded rim and the porous coating, the cups have a 2mm diametrical press-fit at the rim and a 1mm press-fit at the dome. An excellent press-fit is generally achieved by using a cup that is labeled as the same diameter as the largest acetabular reamer used when the cup is placed into normal, firm bone. In general, the acetabulum should be underreamed by 1mm for patients with softer bone, such as patients with rheumatoid arthritis or disuse osteoporosis.

REAMERS

When using the LINEAGE® reamers, care should be taken not to over ream the acetabulum due to the aggressive tooth design. If a deep profile shell is to be implanted, remember that the rim of the shell extends 5mm further than the hemispherical reamer being used.

NOTE | Trial shells are exactly the same size as the reamer and therefore slightly smaller than the implants.

ACETABULAR COMPONENT INSERTION

Please note, when affixing the shell to the shell impactor that there are laser marked lines on the rim that correspond to the screw hole locations. Use these laser marks to ensure that the screw holes are placed in the desired position and fully seat the acetabular component with a series of firm mallet blows to the end of the impactor. Complete seating of the implant can be confirmed through the apical hole and any other screw holes. | **FIGURE 3**

NOTE | After the cup is inserted, impinging bone should be excised prior to insertion of the trial or the alumina ceramic liner.



FIGURE 4 |

An alignment guide can be mounted to the impactor to aid in positioning the implant. The guide is set for 45° degrees of cup abduction and 15° degrees of flexion. The position of the guide can be adjusted by loosening the lock nut and rotating the guide. Once in position, tighten the guide.

Rotate the guide until the appropriate marked cross bar points to the patients ipsilateral shoulder. The alignment guide should be tilted 5 degrees downward if 40, rather than 45 degrees of abduction is desired. | **FIGURE 4**

CAUTION | Caution should be taken to avoid scratching or denting the rim or internal taper of the shell. Injury to the shell taper will create stress-risers at the shell-liner interface. If the locking mechanism is damaged during implantation, the shell should be replaced

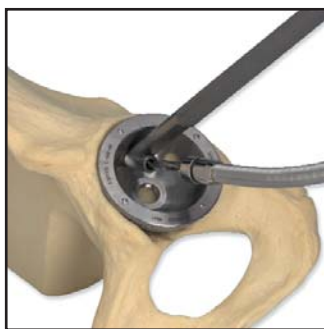


FIGURE 5 |

SCREW PLACEMENT AND FIXATION

While many acetabular components achieve good stability without the need for supplementary screws, auxilliary screw fixation is an option. LINEAGE® shells with screw holes are designed for use with the 6.5mm cancellous screws. Only use screws provided by Wright Medical Technology that are designed for use with the LINEAGE® Acetabular System. Determine screw location and select a suitable length drill bit. Drill bits are provided in 3.2mm and 4.5mm diameters, in modular and non-modular options. The drill guide is also available in 3.2mm and 4.5mm diameters with fixed angle and adjustable angle options.

Insert the drill into the guide and carefully drill through the subchondral bone. | **FIGURE 5**

Use the screw depth gauge to determine the appropriate length screw.

| **FIGURE 6**

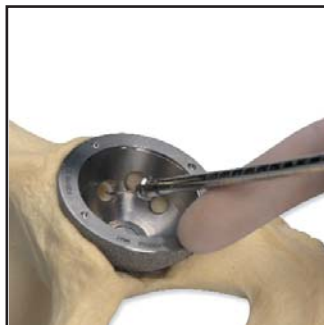


FIGURE 6 |

CAUTION | Due to intrapelvic vascularity, screw placement in the medial aspect of the acetabulum must be carefully considered.

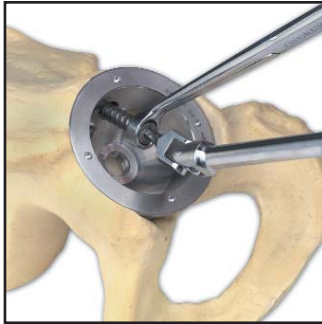


FIGURE 7 |

If extremely hard bone is encountered, a series of bone taps are provided to aid in screw fixation. The screws can be used with either 3.2mm or 4.5mm drills.

Grasp the screw head with the screw holding forceps and utilize the hex screwdriver to orient and fixate the screw. Centralize the screw to protect the threads from abrasion and assure the countersinking of the screw head within the hole. Release the screw holding forceps to allow for countersinking of the screw head, which assures full seating of the prosthetic liner. | **FIGURE 7** Full seating of the liner can be confirmed with the use of a trial liner prior to impacting the prosthetic liner, or by manually examining the inner surface of the shell to check if the screw head is proud.

CAUTION | To ensure proper prosthetic liner seating in the shell, all screw heads must be seated below the inner surface of the shell. Full and unobstructed seating is crucial to implant fit and longevity.

TRIAL LINER EVALUATION

Trial liners that match the prosthetic implant are available to evaluate the optimum position of the final implant.

With prosthetic shell secured in place, insert the trial liner into the shell and secure it with the screwdriver. | **FIGURE 8**

If a polyethylene lipped liner is to be used, take note of the position of the lip prior to removal of the trial for later reference.

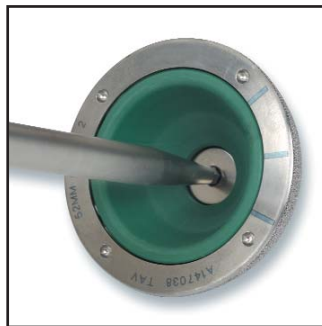


FIGURE 8 |

NOTE | Care should be taken to avoid prosthetic femoral neck-acetabular impingement in all potential positions. The acetabular component should be repositioned as necessary to relieve impingement. Also, especially if a ceramic liner is to be used, care should be taken to avoid harm to the internal rim and taper of the titanium shell with surgical instruments.

The trial liner can be used with final shell implant or the spiked trial shell.



FIGURE 9 |

APICAL PLUG INSERTION

NOTE | The apical hole plug should not be inserted until a trial reduction with the trial liner is completed.

After a satisfactory trial reduction and assessment of joint stability, seal the apex hole using the apical hole plug, which is packaged pre-attached to a polyethylene insertion rod. The polyethylene rod will break free from the hole plug as it is being tightened. | **FIGURE 9**

A final tightening of the hole plug should be performed using a 3.5mm hex screwdriver.



FIGURE 10 |

LINER PLACEMENT METHOD

The inner shell area must be cleared of soft tissue and debris before the prosthetic liner is locked into place.

Place the liner in the selected position making sure the face of the liner is level with the face of the shell.

The alumina ceramic liner implant then should be fully seated by hand, prior to final impaction. | **FIGURE 10**

Toggle opposite sides of the liner rim to ensure that it is fully seated and the rim of the liner is level with the face of the shell.



FIGURE 11 |

Once the liner is fully seated by hand, liner impaction may be done by utilizing trial femoral heads. Assemble the modular taper tip to the impactor handle. Attach the appropriate femoral head trial that corresponds to the liner I.D. and place into the liner, then apply a series of firm mallet blows to fully seat the liner. | **FIGURE 11**

A final inspection of the liner should be done to ensure the liner is firmly locked in place, and is flush with the shell face.



FIGURE 12 |



FIGURE 13 |

PROSTHETIC EXTRACTION

LINER REMOVAL

To remove a metal or ceramic liner, thread the appropriate size liner extractor onto the shell impactor handle. Align the tabs on the extractor with the dimples on the shell face, apply two mallet blows, and inspect the liner for disengagement. | **FIGURE 12** and | **FIGURE 13** Repeat if necessary until the liner is removed.

LINEAGE® ACETABULAR CUP SYSTEM

SHELLS

Titanium
14° Rim Flare
18° Internal Taper
Beaded Porous Surface
Quadrant and Solid
Standard and Deep Profile
Spiked
Apical Hole Plug

The unique internal taper and locking groove allows the use of Polyethylene, Metal, or Ceramic bearing liners to be used in a single shell design.

A 14° flare rim geometry transfers load to the periphery of the acetabulum, providing long term intrinsic stability.

CERAMIC LINER

Alumina Ceramic
0° Lip
Standard Offset
28, 32 and 36mm Inside Diameters
Taper Locking Mechanism



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