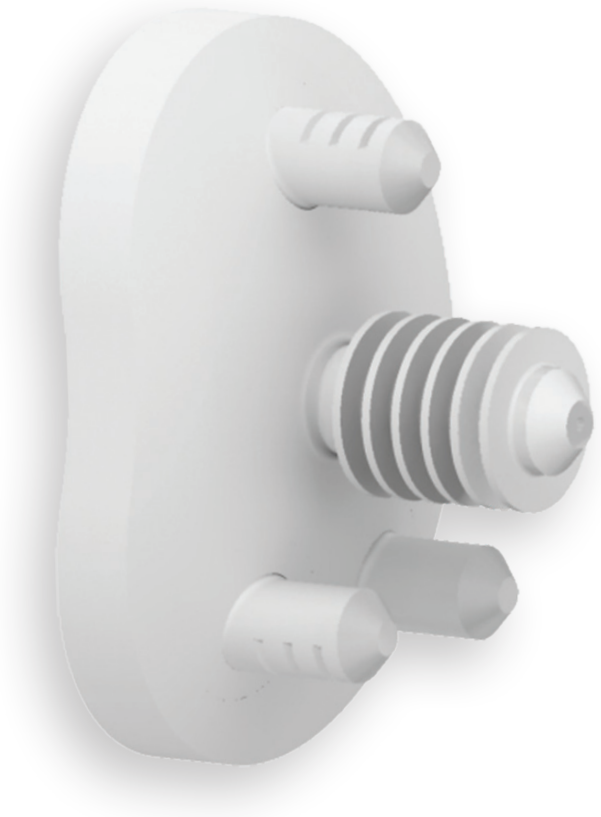
stryker

Tornier Perform®
Anatomic Glenoid – Core

Operative technique



This publication sets forth detailed recommended procedures for using Stryker devices and instruments. It offers guidance that you should heed, but, as with any such technical guide, each surgeon must consider the particular needs of each patient and make appropriate adjustments when and as required.

Important

- The patient should be advised that the device cannot and does not replicate a normal healthy bone, that the device can break or become damaged as a result of strenuous activity or trauma and that the device has a finite expected service life.
- Removal or revision of the device may be required sometime in the future.
- Cleaning and sterilization information is provided in the applicable instructions for use.
- Non-sterile devices, including implants and instruments, must be cleaned and sterilized prior to use, in accordance with validated methods.
- Devices that are able to be disassembled should be disassembled prior to point-of-use processing. Additionally, devices with movable components that do not facilitate disassembly should be manually articulated during the point-of-use processing step in order to evacuate additional soils.
- Please remember that the compatibility of different product systems has not been tested unless specified otherwise in the product labeling.
- Consult Instructions for Use (https://ifu.stryker.com) for a complete list of potential adverse effects and adverse events, contraindications, warnings and precautions.
- The surgeon must advise patients of surgical risks, and make them aware of adverse effects and alternative treatments.
- An implant whose packaging is open or damaged or whose expiration date has passed must not be used. Every precaution must be taken to ensure sterility when opening the packaging of the implant and during implantation.

Tornier Perform

Anatomic Glenoid – Core

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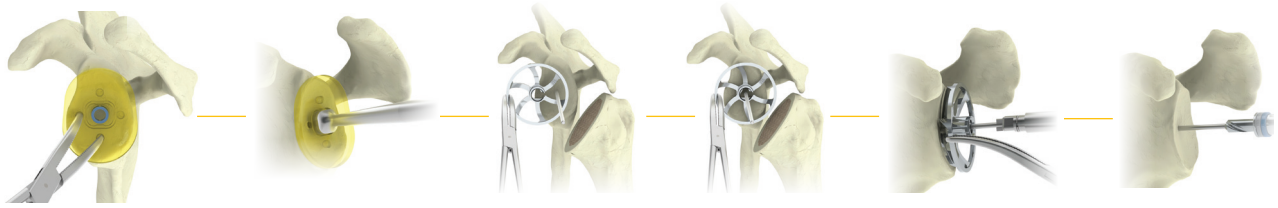
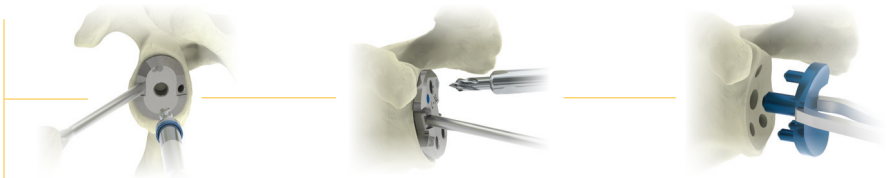


Size — Place pin — Position reamer — Ream — Drill

Anchorage specific surgical flow

Cortiloc



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Implant indications and contraindications

Tornier Perform Anatomic Glenoid – Core

The Tornier Perform Anatomic Glenoid – Core set offers a Cortiloc pegged anchorage option. The Tornier Perform Anatomic Glenoid – Core design is based on extensive anatomic studies* and are offered in 3 sizes. Refer to the common set for XL sizes. Additionally, both common and anchorage specific instrumentation are included in the Tornier Perform Anatomic Glenoid – Core.

Stryker shoulder prostheses are intended for replacement of the shoulder joint to reduce pain and improve shoulder mobility in comparison with preoperative status.

Indications

Prosthetic replacement with this device (Tornier Perform Glenoid Component + Humeral Component) may be indicated to relieve severe pain or significant disability caused by:

- Degenerative pathologies: osteoarthritis, rheumatoid polyarthritis, post-traumatic arthritis
- Primary and secondary necrosis of the humeral head
- Displaced 4-part upper humeral fracture
- Humeral head fracture
- Other pathologies where arthrodesis or resectional arthroplasty of the humeral head are not acceptable
- Revisions when other treatments or devices have failed

The Tornier Perform Anatomic Glenoids are for use with only cemented applications and are labeled as such.

Contraindications

- Systemic infection
- Fever and/or local inflammation
- Rapid joint destruction or bone resorption apparent on roentgenograms
- Elevation of sedimentation rate unexplained by other disease, elevation of WBC count
- Distant foci of infection from genitourinary, pulmonary, skin and other sites, dental focus infection that may cause haematogenous spread to the implant site
- Use of this implant is contraindicated in the presence of significant injury to the upper brachial plexus
- Poor quality and/or insufficient quantity of glenoid bone stock (pre- or intraoperative glenoid fracture…)
- Nonfunctional deltoid or external rotator muscles
- Important and non-reparable rupture of the rotator cuff
- Neuromuscular disease (e.g. joint neuropathy)
- Known or suspected allergy to one of the materials
- Patient pregnancy

*Tornier internal data on file

System compatibility

The Tornier Perform Anatomic Glenoid – Core has been designed to be compatible with the Tornier Simpliciti, Aequalis, Affiniti and Tornier Flex Shoulder Systems in certain combinations. For more information on the cleared combinations refer to the mismatch charts listed below.

(All models are not cleared in all countries; please contact your Stryker representative for information about the availability.)

Tornier Perform Anatomic Glenoids (Cemented and Cortiloc) with Tornier Flex STB Humeral Heads – mismatch chart

Recommended combinations heads/glenoids
Diametrical mismatch in mm, the cleared range for this combination is 1mm to 24.8mm.

Size	Heads	39x13	39x15	42x14	42x16	42x18	45x15	45x17	45x19	48x16	48x18	48x20	51x17
Glenoid	Diameter of curvature	42.3	40.4	45.5	43.6	42.5	48.8	46.8	45.6	52	50	48.8	55.3
Small	55.4	13.1	15	9.9	11.8	12.9	6.6	8.6	9.8	3.4	5.4	6.6	0.1
Medium	59.6	17.3	19.2	14.1	16	17.1	10.8	12.8	14	7.6	9.6	10.8	4.3
Large	63.6	21.3	23.2	18.1	20	21.1	14.8	16.8	18	11.6	13.6	14.8	8.3
XL*	67.8	25.5	27.4	22.3	24.2	25.3	19	21	22.2	15.8	17.8	19	12.5

*XL sizes are special order

Size	Heads	51x20	51x23	54x18	54x21	54x24	56x24
Glenoid	Diameter of curvature	52.5	51.3	58.5	55.7	54.4	56
Small	55.4	2.9	4.1	-3.1	-0.3	1	-0.6
Medium	59.6	7.1	8.3	1.1	3.9	5.2	3.6
Large	63.6	11.1	12.3	5.1	7.9	9.2	7.6
XL*	67.8	15.3	16.5	9.3	12.1	13.4	11.8

*XL sizes are special order

Tornier Perform Anatomic Glenoids (Cemented, and Cortiloc) with Aequalis/Tornier Simpliciti Heads – mismatch chart

Recommended combinations heads/glenoids
Diametrical mismatch in mm, the cleared range for this combination is 1mm to 24.8mm.

Size	Heads	37x13.5	39x14	41x15	43x16	46x17	48x18	50x16	50x19	52x19	52x23	54x23	54x27
Glenoid	Diameter of curvature	39	41.2	43	45	48	50	55	52	54.6	52.4	54.7	54
Small	55.4	16.4	14.2	12.4	10.4	7.4	5.4	0.4	3.4	0.8	3	0.7	1.4
Medium	59.6	20.6	18.4	16.6	14.6	11.6	9.6	4.6	7.6	5	7.2	4.9	5.6
Large	63.6	24.6	22.4	20.6	18.6	15.6	13.6	8.6	11.6	9	11.2	8.9	9.6
XL*	67.8	28.8	26.6	24.8	22.8	19.8	17.8	12.8	15.8	13.2	15.4	13.1	13.8

Cleared mismatch range Non-cleared mismatch range

*XL sizes are special order

System compatibility

Tornier Perform Anatomic Glenoids (Cemented, and Cortiloc) with Tornier Flex Shoulder System – mismatch chart

Recommended combinations heads/glenoids
Diametrical mismatch in mm, *the cleared range for this combination is 1mm to 24.8mm.

Size	Heads	38	40	42	44	46	48	50	52	54
Glenoid	Diameter of curvature	39.2	41.4	43.4	45.4	47.6	49.6	51.6	53.8	55.8
Small	55.4	16.2	14	12	10	7.8	5.8	3.8	1.6	-0.4
Medium	59.6	20.4	18.2	16.2	14.2	12	10	8	5.8	3.8
Large	63.6	24.4	22.2	20.2	18.2	16	14	12	9.8	7.8
XL*	67.8	28.6	26.4	24.4	22.4	20.2	18.2	16.2	14	12

Cleared mismatch range Non-cleared mismatch range

*XL sizes are special order

Preoperative planning

Pre-operative planning is performed utilizing radiographic templates on the AP, axillary and lateral views.

Appropriate implant size and positioning is determined.

The use of a CT scan or MRI is recommended to better determine the orientation of the glenoid, the quality of glenoid bone stock and to confirm the integrity of the rotator cuff.

Common techniques for Cortiloc glenoids

Exposure

With the arm abducted and internally rotated, a posterior glenoid retractor is placed on the posterior glenoid border as the proximal humerus is dislocated posteriorly and inferiorly. An angled retractor placed above the glenoid and an angled Kolbel retractor placed in the subscapular fossa are used to complete the exposure. **| Figure 1**

If preoperatively the humerus rests in a fixed posteriorly subluxed position, then the posterior capsule may be stretched out sufficiently so that a posterior capsular release for exposure may not be necessary.

If, after releasing the entire anterior capsule down to 6 o'clock on the glenoid face the shoulder is still tight, then additional capsule is released around the posterior inferior corner and up the posterior side until the humerus can be adequately retracted for exposure (labrum and posterior capsule). **| Figure 1**

The glenoid retractor then is moved upward if more of the posterior release needs to be completed. **| Figure 2**

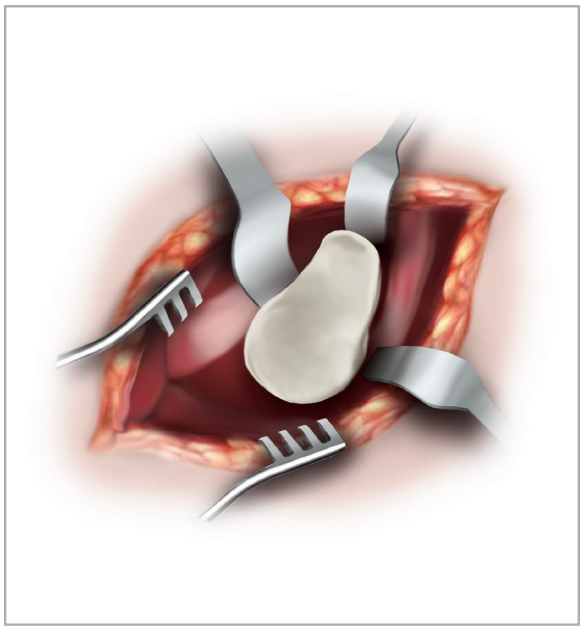


Figure 1

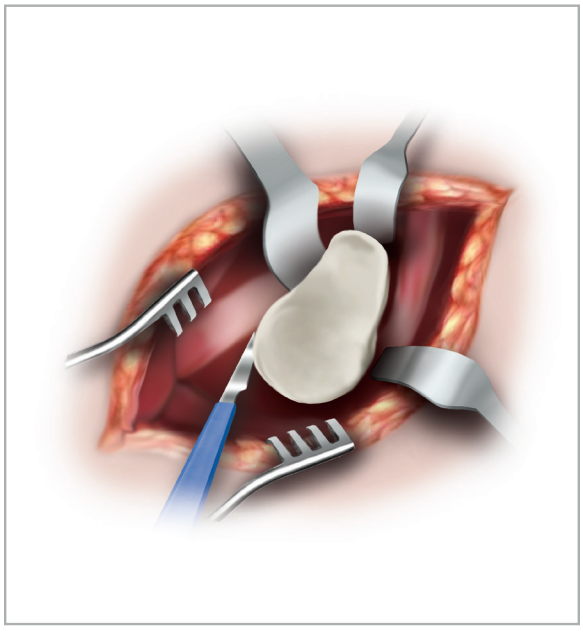


Figure 2

Common techniques for Cortiloc glenoids

Articular curvature overview

Recent studies have demonstrated that the articular curvature of arthritic glenoids is much different than that of normal glenoids. In particular, one recent study reported the average arthritic glenoid articular curvature as 40mm with a range of 11 standard deviations, while the average normal glenoid articular curvature is 32mm with a range of 3 standard deviations. (Internal data on file)

Tornier Perform Anatomic Glenoid – Core is the first system to incorporate these new finding by offering multiple backside curvatures of each size glenoid to preserve as much cortical bone as possible. The chart below demonstrates the multiple backside curvatures for each of the four glenoid sizes.

Backside radius	Small	Medium	Large	Extra large*
30	S 30	M 30		
35	S 35	M 35		
40	S 40	M 40	L 40	XL 40
50			L 50	XL 50
60			L 60	XL 60

*XL sizes are special order

Color coding

To improve operative efficiency, the Tornier Perform Anatomic Glenoid – Core instrumentation has been color coded by size. Please refer to the chart above to see which colors are associated with which sizes.

Small Medium Large

Common techniques for Cortiloc glenoids

Determining articular curvature

Three radius gauges are provided to assist in determining the general size and curvatures of the glenoid. Each radius gauge is marked with the size (S-M, L-XL) and the radius (SM R30 & R35, SM R40 & LXL R40, LXL R50 & LXL R60). **| Figure 3**

Notice: If XL is measured, refer to the Tornier Perform Anatomic Glenoid Technique.

The size is used to measure the best fit of the glenoid superiorly/ inferiorly.

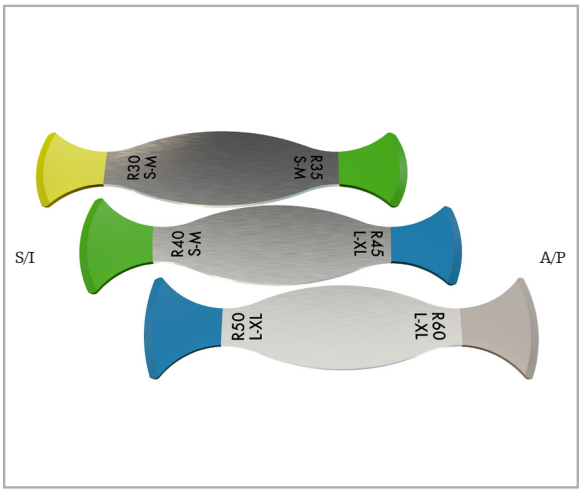


Figure 3

To determine the curvature of the glenoid, place a radius gauge against the center of the glenoid.

Select the gauge that most precisely fits the native glenoid. This radius will be a determining factor in which instruments are used in subsequent steps. Evaluate the fit of the radius gauge to the face of the glenoid superiorly and inferiorly, keeping the gauge centered in the glenoid at all times. **| Figures 4 and 5**

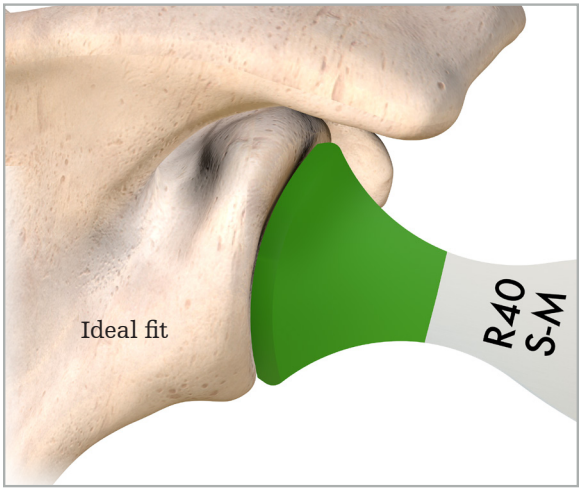


Figure 4

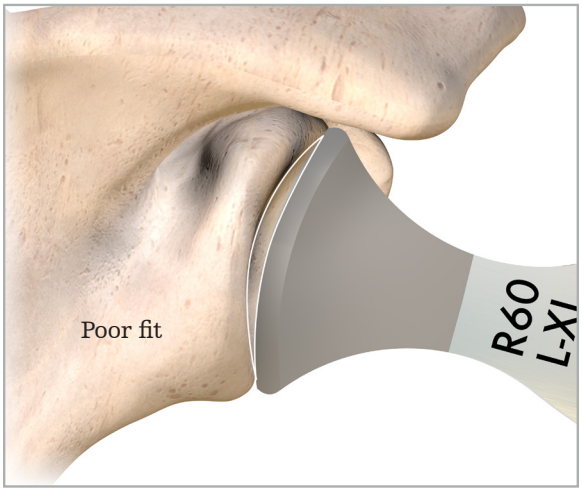


Figure 5

Cannulated approach

Confirming the glenoid size

The glenoid size and curvature can be confirmed with the sizer. This is done by applying pressure to the sizer and evaluating the contact area between the bone and sizer. The sizer that has the best match will determine the size and the curvature. **| Figure 6**

When using the cannulated approach, a pin guide is available that can be attached to the sizer via the rectangular shaped groove. This allows for easy manipulation of the sizer on the face of the glenoid. **| Figure 7**

Additionally, the guides are cannulated in 0°. It is important to note that the pin guide can be placed in either the anterior or posterior direction due to the rectangular shape. This allows for the sizer to be placed on the native surface or within the worn defect of the glenoid when placing the guide pin.

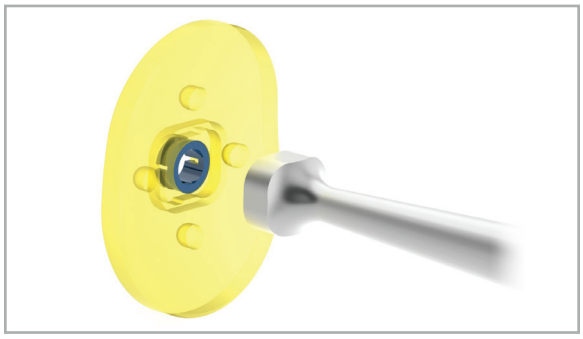


Figure 6

Figure 7

With the appropriate sizer and pin guide assembled, center the sizer on the glenoid and advance the guide pin until bi-cortical fixation is achieved. Then slide the assembly off the guide pin to prepare for reaming. **| Figures 8 and 9**

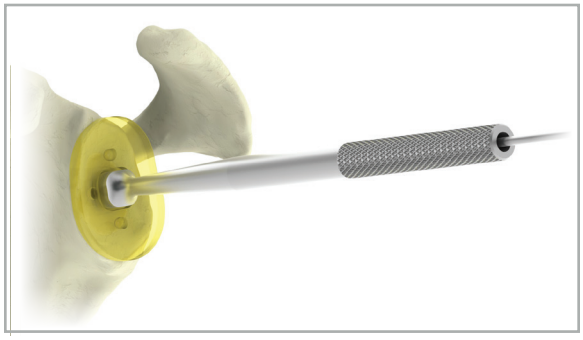


Figure 8

Notice: If the cannulated pin bends or appears to be bent in any step of the procedure, it must be removed and replaced by a new pin.

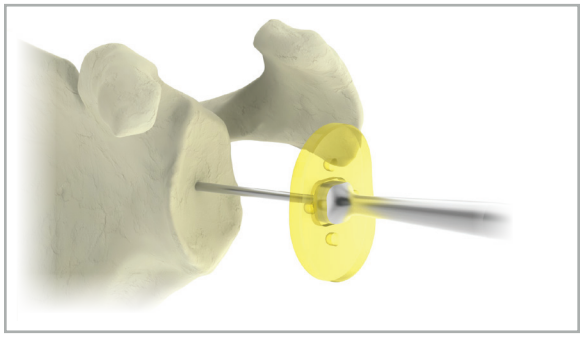


Figure 9

Cannulated approach

Resurfacing the glenoid

If the exposure is sufficient to place the reamer down the pin without interference, select the reamer that corresponds with the size and curvature determined in previous steps and attach it to the cannulated reamer driver.

If exposure is difficult, a special slot in the internal ring of the reamer will allow the reamer to easily be slided down the pin and past the humerus before the handle is attached to the reamer. **| Figure 10**

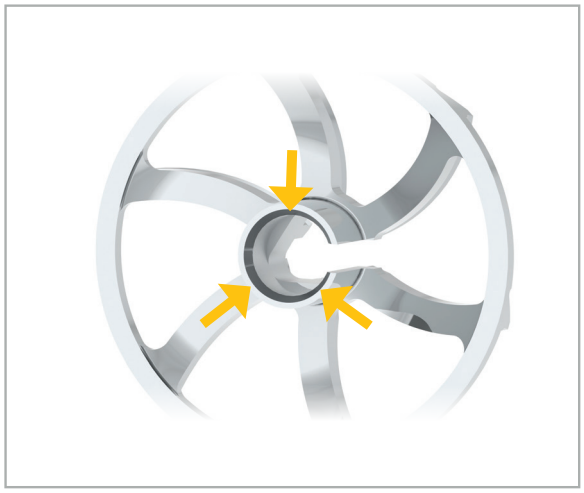


Figure 10

To begin, identify which section of the reamer includes the slot and then place this section over the guide pin. This will allow the reamer to be easily maneuvered past the humerus and retractors. Once the reamer has been introduced into the joint space, slide the central portion of the reamer onto the pin. **| Figure 11**

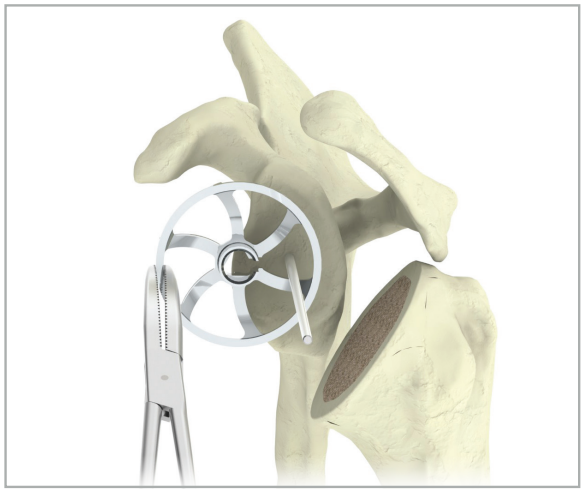


Figure 11

Next, place the cannulated reamer driver over the pin. Align the flats on the tip of the driver with those on the reamer and apply pressure to attach the driver to the reamer. **| Figure 12**

Notice: It is recommended to irrigate with saline solution while reaming and drilling to prevent heat buildup which can lead to necrosis of the surrounding bone.

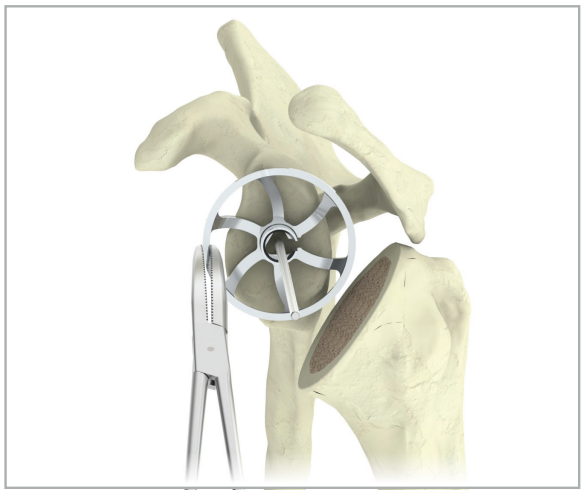


Figure 12

Cannulated approach

Resurfacing the glenoid (continued)

Always begin by hand reaming and advance to power reaming only if necessary. If power is used, engage the reamer prior to contacting the glenoid surface and apply light pressure. This will help to reduce the risk of fracture. **| Figure 13**

The goal of reaming is to obtain a bony surface that matches the backside of the glenoid component while removing as little bone as possible. The fit between the glenoid component and the bony surface can be evaluated utilizing the sizer from previous steps.

Notice: It is not advisable to ream down to cancellous bone. Overaggressive reaming should be avoided to prevent possible glenoid fracture and the future risk of component shift or subsidence.

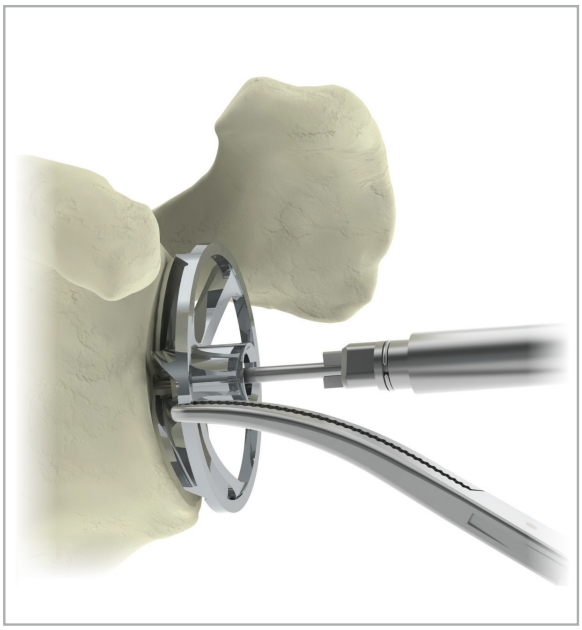


Figure 13

Once reaming is complete, remove the assembly by sliding it off the pin. **| Figure 14**

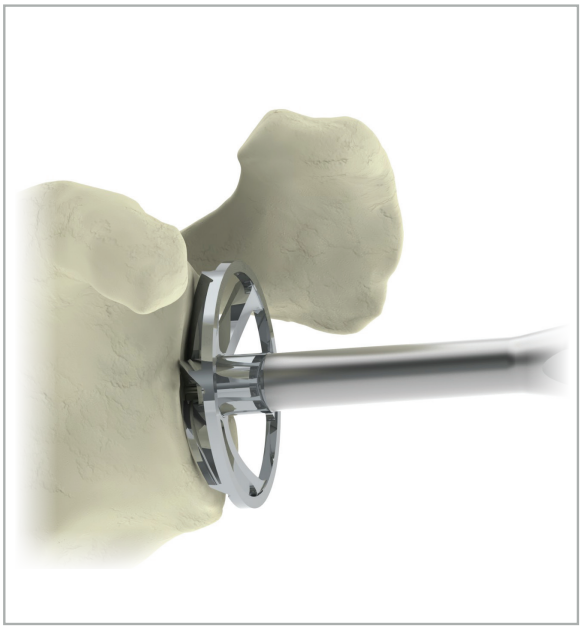


Figure 14

Cannulated approach

Drilling the central hole

Two drill bit lengths are available, one for the S/M and one for the L/XL size glenoid. To drill the central hole, select the appropriate length (S/M or L/XL) 6mm cannulated central drill bit and attach it to the drill/reamer driver. Place the assembly over the pin and drill until the collar of the bit is flush with the glenoid. **| Figure 15**

Remove the assembly over the guide pin and then remove the guide pin before proceeding to the next step.

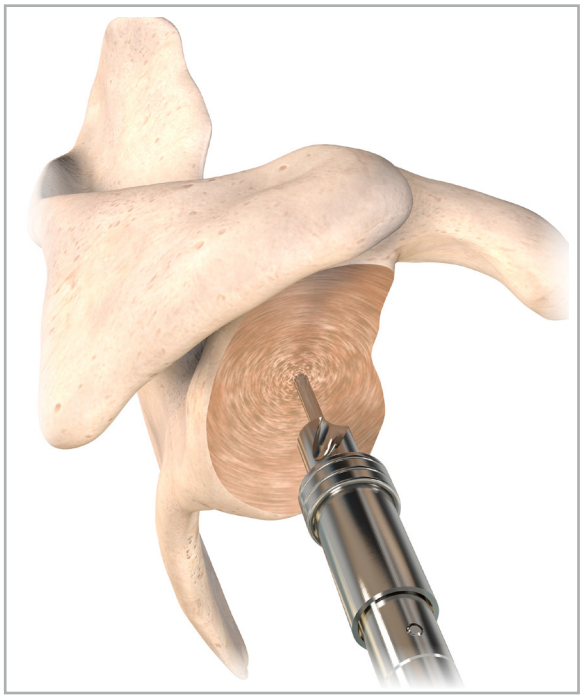


Figure 15

Standard approach

Select the glenoid size

To select the glenoid size, select the sizer that best matches the peripheral rim of the glenoid.

Attach the sizer to the clamp via the small holes in the sizer. **| Figure 16** Place the sizer onto the glenoid and select the sizer that best matches the peripheral rim of the glenoid. The central location can then be marked through the sizer.

Notice: If XL is sized, refer to the Tornier Perform Anatomic Glenoid technique.

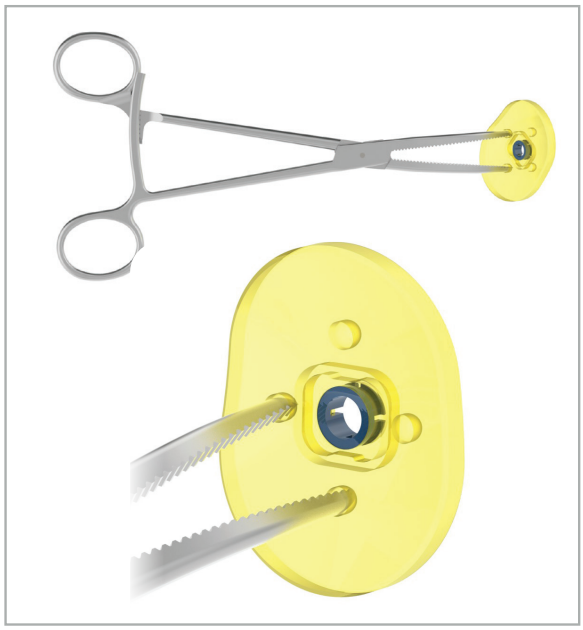


Figure 16

The transparent sizers can also be utilized to confirm the curvature of the glenoid. This is done by applying pressure to the sizer and evaluating the contact area between the bone and sizer. **| Figure 17** The sizer that has the best match will confirm the curvature.

Figure 17

Standard approach

Drilling the central hole

When using the standard approach, begin by attaching the drill guide handle to the central hole drill guide. Then select the appropriate length (S/M or L/XL) 6mm central hole drill bit and attach it to the drill/reamer driver via the quick connect mechanism.

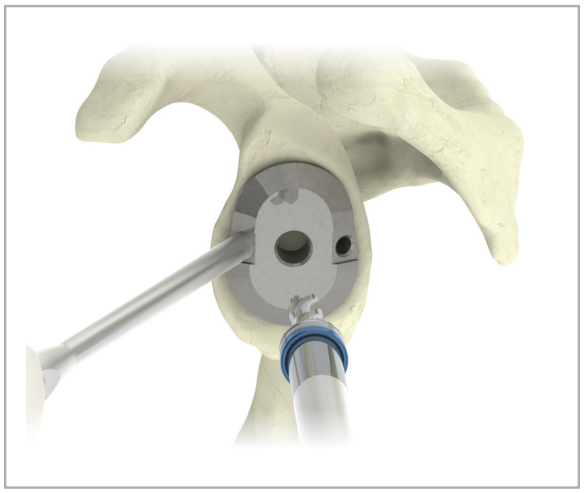


Figure 18

Once the instruments are assembled, align the guide with central mark that was made when using the sizer **| Figure 18** and drill the central hole until the drill bit collar bottoms out on the drill guide. (The drill bit is provided with a laser etch line which represents the depth to be drilled for those who prefer not to use the drill guide.) **| Figure 19**

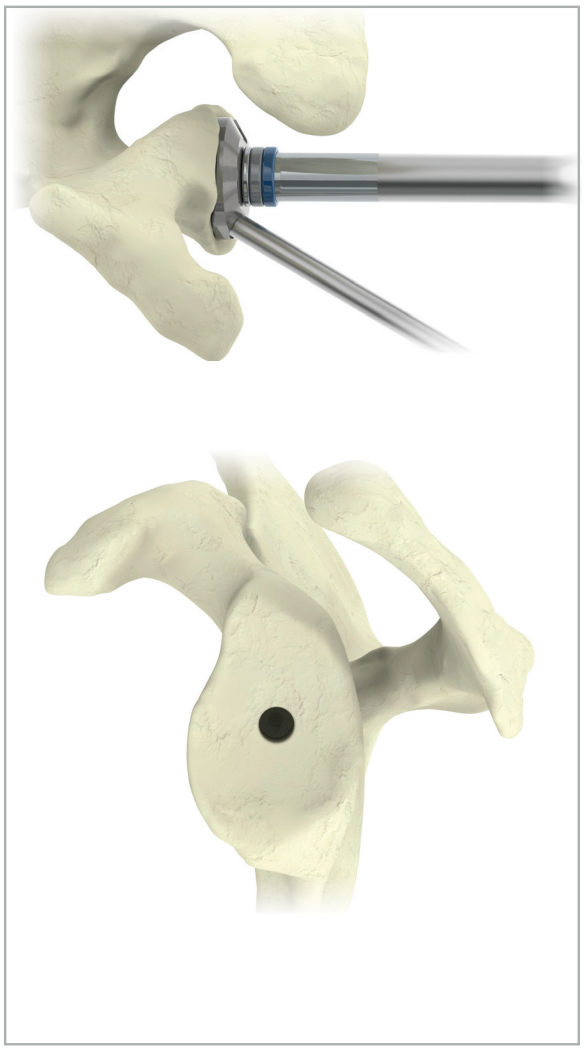


Figure 19

Implantation of the Cortiloc pegged glenoid

Preparing the peg holes

If not completed in a previous step, the central hole should be enlarged at this time.

To enlarge the hole, attach the appropriate length (S/M or L/XL) 8.4mm Cortiloc Drill Bit to the drill/reamer driver. Then assemble the Cortiloc Central Drill Guide to the drill guide handle.

Place the drill guide on the reamed glenoid. Drill until the collar of the bit contacts the guide. (The drill bit is provided with a laser etch line which represents the depth to be drilled for those who prefer not to use the drill guide.)

Once completed, remove the drill guide and prepare the peripheral holes.

To prepare the peripheral holes, begin by selecting one of the S/M or L/XL Cortiloc Drill Guides.

Attach the drill guide to the drill guide handle and insert the tip post on the backside of the guide into the central hole.

Align the drill guide on the glenoid. With the drill guide in place, attach the peripheral drill bit to the drill/reamer driver. Drill the superior hole until the collar of the drill bit contacts the guide. **| Figure 20 A, B**

Using the stabilization peg clamp, place the stabilization peg into the superior hole and then drill the anterior hole. A second stabilization peg can be inserted for additional stability and the posterior hole is then drilled.

The stabilization pegs can then be removed along with the guide.

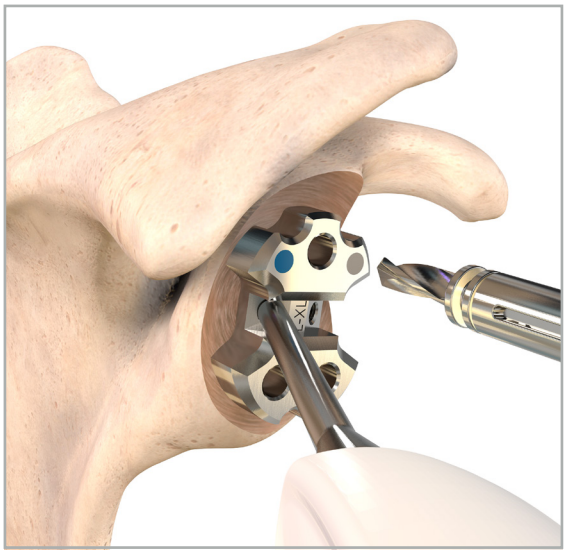


Figure 20 A

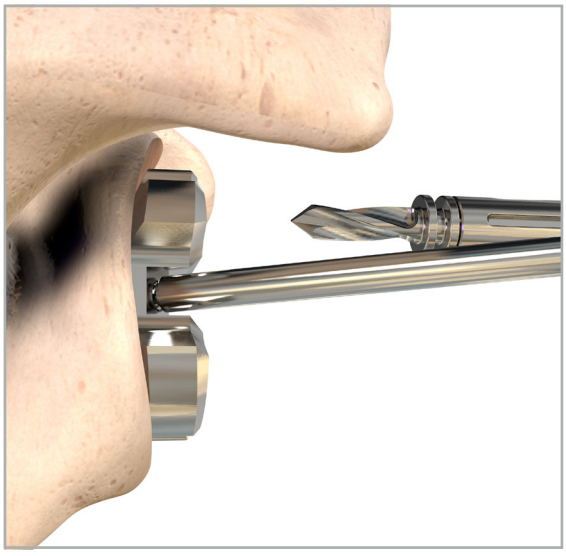


Figure 20 B

Implantation of the Cortiloc pegged glenoid

Positioning the Cortiloc glenoid component

Once the peripheral holes have been fully prepared, select the appropriate size trial glenoid. The trial is inserted into the glenoid using the trial grasper and can be seated with the impactor. **| Figure 21**

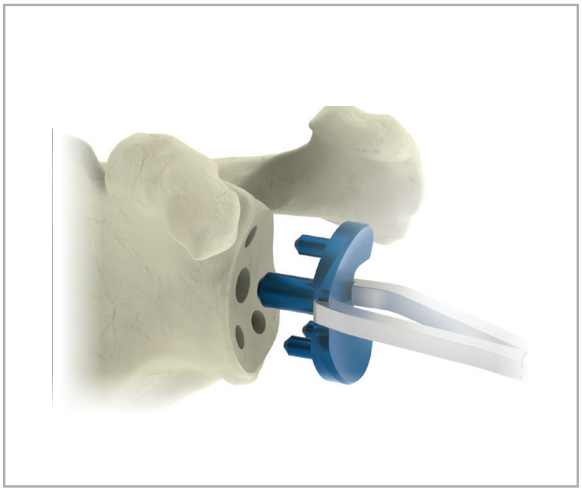


Figure 21

Two windows, anterior and posterior, allow visualization of the bone to trial interface. **| Figure 22** If the trial has acceptable backside support, remove the trial with the grasper.

Figure 22

It is recommended to carefully clean and dry the glenoid surface and peg holes prior to cementing.

Once the glenoid is clean and dry, introduce the bone cement and impact the final implant. It is not recommended to cement the back of the glenoid. **| Figure 23** It is recommended to maintain pressure on the face of the glenoid with the impactor while the cement hardens.*

The final implant can then be inserted with the trial grasper and seated using the impactor. It is recommended to maintain pressure on the face of the glenoid with the impactor while the cement hardens.

Notice: The pegs should not be altered in any manner prior to implantation.

Notice: Once a specific anchorage size (S/M or L/XL) has been prepared, it is not advisable to upsize or downsize the implant.

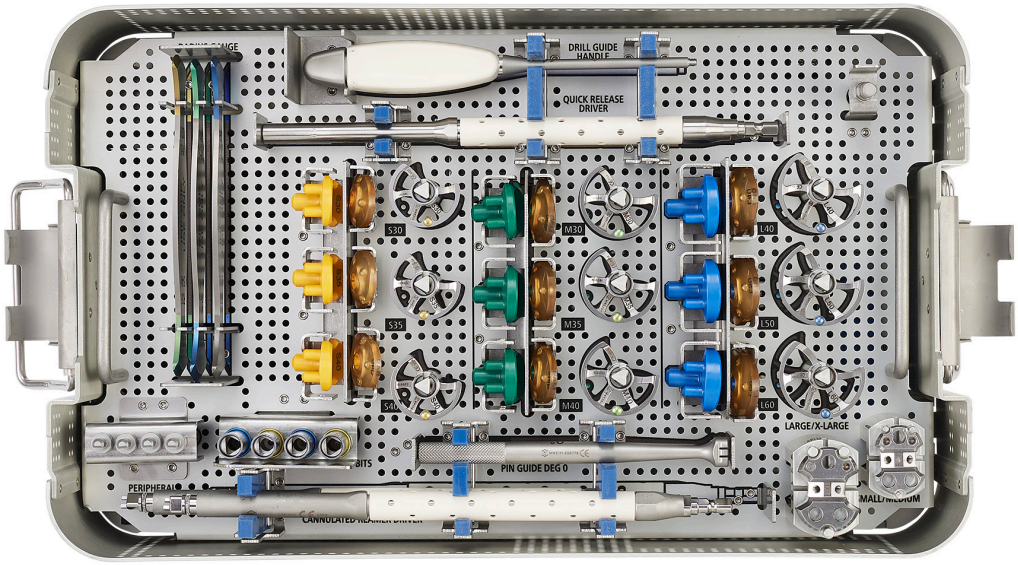
Reduction testing and closure

The reduction of the joint, testing of mobility and stability and closure is described in detail in the humeral operative technique.

Figure 23

*Long-term results of cancellous compaction technique for glenoid replacement in total shoulder arthroplasty for primary osteoarthritis. O. Verborgt, G. Walch, V. Belloti, and D. Gazielly.

Components



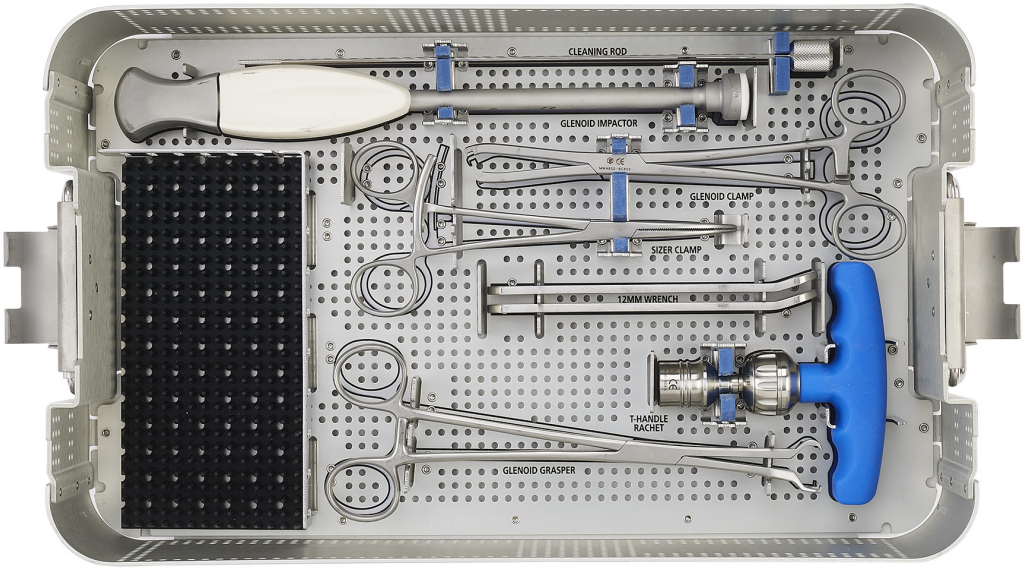
Top tray

Reference	Description
MWH752*	Perform ASC radius gauge SM R30 and R35
MWH753*	Perform ASC radius gauge SM R40 and LXL R40
MWH754*	Perform ASC radius gauge LXL R50 and R60
MWE042	Drill guide handle
MWH686	Quick release driver
MWB253	Pin driver
MWE401	S30 Cortiloc pegged glenoid trial
MWE402	S35 Cortiloc pegged glenoid trial
MWE403	S40 Cortiloc pegged glenoid trial
MWE011	S30 sizer
MWE012	S35 sizer
MWE013	S40 sizer
S30 Sizer	S30 crescent reamer
S35 Sizer	S35 crescent reamer
S40 Sizer	S40 crescent reamer
MWE411	M30 Cortiloc pegged glenoid trial
MWE412	M35 Cortiloc pegged glenoid trial
MWE413	M40 Cortiloc pegged glenoid trial
MWE014	M30 sizer
MWE015	M35 sizer
MWE016	M40 sizer

Reference	Description
M30 Sizer	M30 crescent reamer
M35 Sizer	M35 crescent reamer
M40 Sizer	M40 crescent reamer
MWE421	L40 Cortiloc pegged glenoid trial
MWE422	L50 Cortiloc pegged glenoid trial
MWE423	L60 Cortiloc pegged glenoid trial
MWE017	L40 sizer
MWE018	L50 sizer
MWE019	L60 sizer
L40 Sizer	L40 crescent reamer
L50 Sizer	L50 crescent reamer
L60 Sizer	L60 crescent reamer
MWH685	Cortiloc/pegged quick release drill bit
MWE202	Cortiloc cannulated central drill bit – small/medium
MWE203	Cortiloc cannulated central drill bit – large/extra large
MWE153	Cannulated central hole drill bit – ø6mm small/medium
MWE155	Cannulated central hole drill bit – ø6mm large/extra large
MWE111	Pin guide 0°
MWE151	Cannulated reamer driver
MWH750*	Perform ASC drill guide – small/medium
MWH751*	Perform ASC drill guide – large/extra large

*Available only in the US.

Components



Bottom tray

Reference	Description
MWB236	Cleaning rod
MWE046	Glenoid impactor
MWA652	Glenoid clamp
MWE110	Sizer clamp
MWD552	12mm wrench
MWE180	T-handle rachet
MWE114	Glenoid grasper

Components

Cortiloc pegged glenoid

Reference	Description
DWE401	S30 Cortiloc Glenoid
DWE402	S35 Cortiloc Glenoid
DWE403	S40 Cortiloc Glenoid
DWE411	M30 Cortiloc Glenoid
DWE412	M35 Cortiloc Glenoid
DWE413	M40 Cortiloc Glenoid
DWE421	L40 Cortiloc Glenoid
DWE422	L50 Cortiloc Glenoid
DWE423	L60 Cortiloc Glenoid
DWE431	XL40 Cortiloc Glenoid
DWE432	XL50 Cortiloc Glenoid
DWE433	XL60 Cortiloc Glenoid

Miscellaneous order information

Reference	Description
DWD014	Pressurization kit peg glenoid
DWD013	Cement scraper
DWD015	Peg nozzle
DWD011	Pressurization kit keeled glenoid
DWD012	Keel nozzle
DWD013	Cement scraper
MWE157 (1)*	Non-sterile pin – 2.5mm x 200mm
DWD063 (2)*	Sterile single use pin – 2.5mm x 200mm
MWB319 (2)*	Non-sterile pin – 2.5mm x 200mm
DWD168 (1)*	Sterile single use pin – 2.5mm x 200mm

* (1) Smooth tip pin
(2) Threaded pin

Notes

Notes

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Manufacturer:

Tornier SAS
161 Rue Lavoisier
38330 Montbonnot Saint Martin
France

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