Futura™

FOREFOOT IMPLANT ARTHROPLASTY PRODUCTS

for the surgical treatment of degenerative conditions and deformities

TORNIER

metal hemi toe implant

The Metal Hemi Toe (MHT) is a cobalt chrome, one piece implant for the supplementation of first metatarsophalangeal joint arthroplasty. Designed with a titanium coated stem to provide an anchor for its smooth articular surface recreating an anatomically correct joint surface for a long lasting correction.

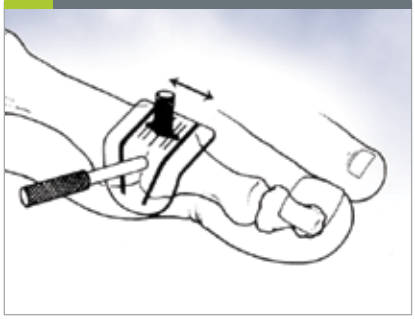
The Metal Hemi Toe Advantage

Design Feature	Advantage
Congruent Articular Surface	Trapezoidal articular surface matches the geometry of the resected base of the proximal phalanx and is anatomically congruent to the metatarsal head
Angled Osteotomy	Allows for flexor hallucis brevis sparing technique and maintains joint construct integrity
Titanium Coated Stem	Encourages osseous integration
Stem Shape	A short, trapezoidal stem provides anatomic fit in the intramedullary canal, with an angulation to help protect the plantar cortex
Plantar Design	The thin plantar aspect of the articular surface allows for preservation of the flexor hallucis brevis attachment site with up to 3 mm of joint decompression
Cobalt Chrome Alloy	Material of choice for articular surfaces in weight bearing joints
FGT Matching Geometry	Matched to the Futura Primus (FGT) implant should conversion to total joint arthroplasty be needed

The Metal Hemi Toe Advantage Surgical Technique

A longitudinal incision is made on the dorsal aspect of the first metatarsal phalangeal joint. The incision is deepened by sharp and blunt dissection to the level of the joint, and the vital structures are retracted. A longitudinal capsulotomy is performed, and the joint is dissected free. All hypertrophic bone is resected from both the metatarsal and phalanx. Metatarsal osteotomy is performed if deemed appropriate. The base of the proximal phalanx is completely freed of its attachments on the medial, dorsal, and lateral aspects.

1



The adjustable cutting guide instrument is then utilized to resect the base of the proximal phalanx at the appropriate level. If the joint has been decompressed on the metatarsal side, only a neutral amount of bone is resected from the base of the phalanx, with the adjustable tab on the osteotomy guide placed in the middle position. If the surgeon wishes to decompress the joint on the phalangeal side, the cutting guide is positioned distally by moving the adjustable tab proximally the appropriate number of millimeters. The maximum adjustment is 3 mm.

2

The burr guide instrument is positioned so the dorsal edge aligns with the dorsal surface of the proximal phalanx. A pilot hole is then placed in the medullary canal using a rotary burr.

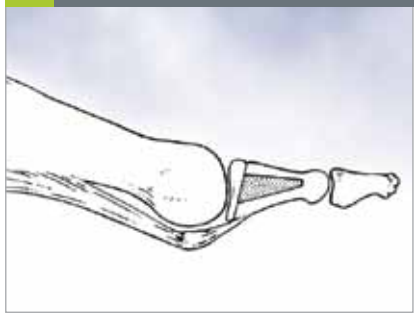
3

The trial sizers are used to select the correct size implant. The broach instrument corresponding to the selected trial sizer is utilized to complete the preparation of the medullary canal. The broach may be used manually using the handle in the instrument tray, or with a reciprocating power hand piece.

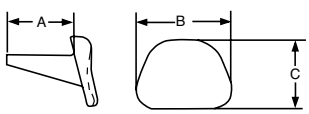
4

The correct size implant is press fit into the medullary canal of the proximal phalanx with the aid of the impactor instrument. For cemented application, the bone canal is over-broached to provide a cement mantle. The joint capsule is closed over the prosthesis and sutured.

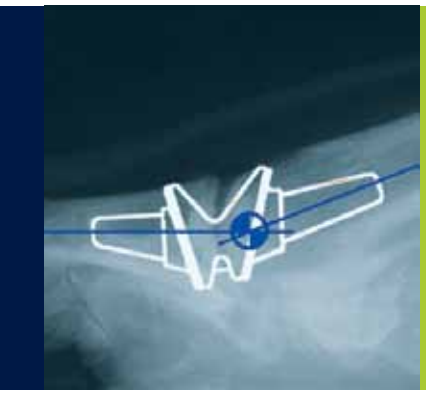
5



Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to other arthroplasty procedures of this joint.



SIZE (mm)	A	B	C
MHT-20	11	16	12
MHT-30	13	19	14
MHT-40	15	22	16



primus great toe implant

FLEXOR TENDON PRESERVING GREAT TOE IMPLANT

The Primus Flexible Great Toe (FGT) is a third generation flexible implant for first metatarsophalangeal joint arthroplasty. It is constructed of durable UltraSIL™ silicone elastomer and its anatomically designed hinge allows for free and natural movement of the 1st MP joint. The design incorporates angled osteotomies allowing for the preservation of the flexor hallucis brevis tendon to function in its natural state.

The Primus Flexible Great Toe Advantage

Design Feature	Advantage
Constructed of UltraSIL	A third generation medical grade Silicon that exhibits improved physical properties when compared to traditionally available materials*
Anatomical Hinge	The patented axial offset hinge design reduces stress on the prosthesis and improves biomechanical function
Angled Osteotomies	Flexor hallucis brevis tendon preserving
Optional Titanium Grommets	Allows for intraoperative flexibility to determine the best approach for each patient
Prosthesis Stems Match Canal Shapes	Phalangeal stem is trapazoidal and Metatarsal stem is rectangular
Hinge Buttresses	A highly engineered hinge offers 95 degree range of motion and prevents the grommets from contacting each other
Rib on Inferior Aspect of Hinge	The patented strength rib aids in the overall strength of the construct and gives the implant its signature rigidity

*Data on file at Tornier, Inc.

Primus Flexible Great Toe Surgical Technique

A longitudinal incision is made on the dorsal aspect of the first metatarsophalangeal joint. The incision is deepened by sharp and blunt dissection to the level of the joint, and the vital structures are retracted. A longitudinal capsulotomy is performed, and the joint is dissected free. The base of the proximal phalanx and the head of the metatarsal are completely exposed. All hypertrophic bone is resected from both the metatarsal and phalanx. Any soft tissue contractures must be released as dictated by the deformity.

1

The cutting guide instrument is then utilized to resect the base of the proximal phalanx and distal portion of the metatarsal head. The tab on the inferior side of the guide is placed within the joint space, and the saw blade is placed in each of the slots of the cutting guide to start the bone cuts.

2

After the appropriate angles have been established, the cutting guide is removed and the bone cuts are completed.

3

A pilot hole is then made in the medullary canal of the metatarsal. The trial sizers are used to chose the correct size implant. The rectangular broach instrument corresponding to the selected trial sizer is utilized to complete the preparation of the medullary canal. A similar procedure is now used to broach the medullary canal of the proximal phalanx, using the appropriate size trapezoidal broach.

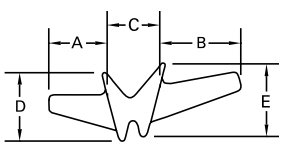
The sizer is now used to check for fit and range of motion. An "Accordion Test" is recommended to be certain there is no jamming of the implant. This test is performed by loading the foot while holding the hallux in its corrected position and checking the medial side of the joint to see if there is any compression of the sizer in a similar manner as an accordion would be compressed. If there is compression of the sizer, then inadequate bone has been resected and additional bone is removed from the base of the proximal phalanx.

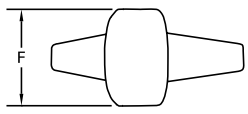
4

When all soft tissue contractures have been released and full range of motion is achieved, the trial sizer is removed and the wound is thoroughly irrigated. If the surgeon elects to use grommets, the grommets are press-fit in place using the grommet impactor instrument. The grommets must seat against the resected bone ends without protruding into the soft tissues. The appropriate size implant is then inserted.

5

The joint capsule is sutured being certain to completely cover the prosthesis. Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to other arthroplasty procedures of this joint.





SIZE (mm)	A	B	C	D	E	F
FGT-20	9.9	13.7	8.9	11.6	12.3	16.3
FGT-30	9.9	13.7	9.9	12.7	13.5	18.0
FGT-40	11.9	16.7	10.9	14.0	14.9	19.8
FGT-50	11.9	16.7	12.0	15.3	16.3	21.6

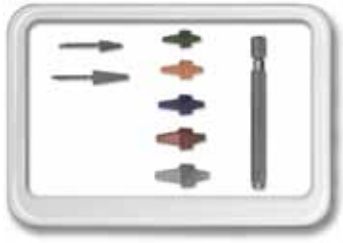
classic great toe implant

The Classic Flexible Great Toe (CGT) is a third generation implant for first metatarsophalangeal joint arthroplasty. It is constructed of durable UltraSIL™ silicone elastomer and its anatomically designed hinge allows for free and natural movement of the 1st MP joint. The implant requires vertical osteotomies eliminating the need to use a cutting guide.

The Classic Flexible Great Toe Advantage

Design Feature	Advantage
Constructed of UltraSIL	A third generation medical grade Silicon that exhibits improved physical properties when compared to traditionally available materials*
Anatomical Hinge	The patented axial offset hinge design reduces stress on the prosthesis and improves biomechanical function
Requires Vertical Osteotomies	Simple cuts require no cutting guide
Anatomically Matched Stems	The stem geometry is optimized for the unique anatomy of the intramedullary canals of the phalanx and metatarsal bones
Rib on Inferior Aspect of Hinge	The patented strength rib aids in the overall strength of the construct and gives the implant its signature rigidity
Hinge Buttresses	A highly engineered hinge offers 95 degree range of motion and prevents the grommets from contacting each other

*Data on file at Tornier, Inc.



Classic Great Toe Surgical Technique

A longitudinal incision is made on the dorsal aspect of the first metatarsal phalangeal joint. The incision is deepened by sharp and blunt dissection to the level of the joint, and the vital structures are retracted. A longitudinal capsulotomy is performed, and the joint is dissected free. The base of the proximal phalanx and head of the metatarsal are completely exposed. All hypertrophic bone is resected from both the metatarsal and phalanx.

1

An appropriate portion of the distal aspect of the metatarsal head and base of the proximal phalanx are then resected. A pilot hole is made in the medullary canal of the metatarsal. The rectangular broach instrument is used to prepare the medullary canal of the metatarsal. A similar procedure is used to broach the medullary canal of the proximal phalanx, using the trapezoidal broach. The trial sizers are utilized to determine the correct implant size. When all soft tissue contractures have been released and full range of motion is achieved, then the trial sizer is removed.

2

The resection of the phalanx base may detach the flexor hallucis brevis tendon. If this occurs, the surgeon should consider performing a flexor tenodesis procedure to maintain functional stability of the joint. A hole is drilled at the inferior aspect of the stump of the proximal phalanx. The flexor hallucis longus tendon is sutured through this hole to the stump of the proximal phalanx.

3

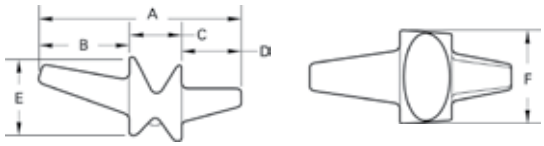
The flexor hallucis brevis tendon is then sutured to the tendon of the flexor hallucis longus, with the sesmoids in a natural position.

4

The appropriate size implant is then inserted in the joint. The capsule is sutured being certain to completely cover the prosthesis.

5

Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to other arthroplasty procedures of this joint.



SIZE (mm)	A	B	C	D	E	F
CGT-20	33.3	15.0	8.8	9.5	12.5	16.0
CGT-30	36.1	16.2	9.4	10.5	13.5	16.9
CGT-40	39.6	17.8	10.0	11.8	15.0	17.9
CGT-50	43.1	20.0	10.7	12.4	15.6	19.0
CGT-60	47.3	21.5	11.4	13.7	17.1	21.0

lesser metatarsal phalangeal implant

The Lesser Metatarsal Phalangeal Implant (LMP) is the first prosthesis designed specifically to supplement lesser metatarsal phalangeal joint arthroplasty. It is constructed of durable UltraSIL™ silicone elastomer and its anatomically designed hinge allows for free and natural movement of the lesser MP joints.

The Lesser Metatarsal Phalangeal Implant Advantage

Design Feature	Advantage
Constructed of UltraSIL	A third generation medical grade Silicon that exhibits improved physical properties when compared to traditionally available materials*
Anatomical Hinge	The hinge design allows for excellent range of motion without stressing the prosthesis
Minimal Bone Resection	A vertical osteotomy in the metatarsal head is all the cutting that is required
Anatomically Matched Stems	Rectangular stems match the anatomy of each medullary canal
Hinge Buttresses	The hinge design allows for the excellent range of motion without stressing the prosthesis
Variable Sizes	The LMP is offered in four sizes and is supported by a custom instrumentation set

*Data on file at Tornier, Inc.

Lesser Metatarsal Phalangeal Surgical Technique

1

An incision is made on the dorsal aspect of the appropriate lesser metatarsal phalangeal joint. The incision is deepened by sharp and blunt dissection to the level of the joint. A longitudinal capsulotomy is performed and the joint is dissected free. The base of the proximal phalanx and the head of the metatarsal are completely exposed. All soft tissue contractures must be released as dictated by the deformity. In most cases, the base of the proximal phalanx is preserved. A pilot hole is made through the joint cartilage of the phalanx base. The medullary canal is reamed to accept the distal stem of the implant, using the smaller broach to create a transverse rectangle.

2

The distal portion of the metatarsal head is resected at the appropriate level for the existing disease or deformity. A pilot hole is made in the medullary canal and the larger broach is utilized to ream the canal, creating a vertical rectangle to accept the proximal stem of the implant.

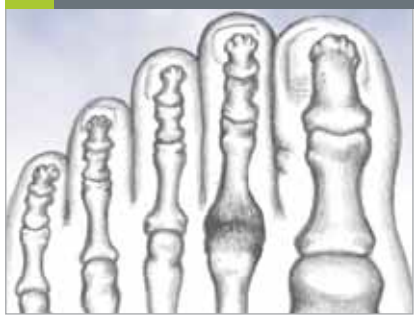
3

The trial sizers are used to select the correct size implant, and to be certain that all soft contractures have been released. It is important to load the foot with the trial sizer in place to be certain there is no jamming of the implant.

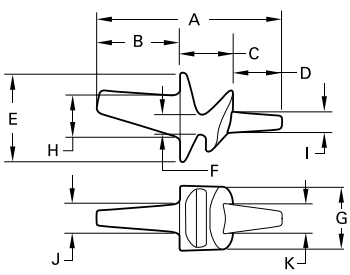
4

The sizer is then removed and the wound thoroughly irrigated. The appropriate size implant is then inserted.

5



The joint capsule is sutured being certain to completely cover the prosthesis. Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to other arthroplasty procedures of this joint.



SIZE (mm)	A	B	C	D	E	F	G	H	I	J	K
LMP-20	21.1	9.2	6.3	5.6	11.2	2.5	8.0	5.1	2.9	3.6	3.7
LMP-30	28.3	12.7	8.0	7.6	14.0	3.1	10.0	6.4	3.4	4.4	4.4
LMP-40	35.1	16.3	9.6	9.2	16.8	3.7	12.0	7.7	3.6	5.2	5.0
LMP-50	42.0	19.8	11.1	11.1	19.6	4.3	14.0	9.0	4.3	6.1	5.9

flexible digital implant

FUNCTIONAL HAMMERTOE REPAIR

The Flexible Digital Implant (FDI) offers an ideal alternative to traditional treatments for Hammertoe deformity. Constructed of UltraSIL™, the FDI is an arthroplasty option that mimics the proximal interphalangeal joint's motion with a low profile anatomically designed hinge.

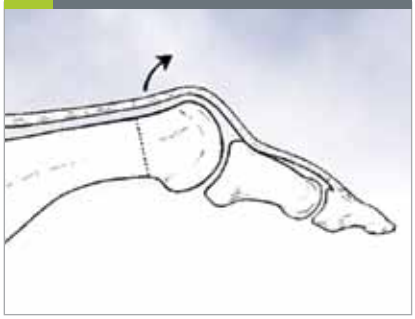
The Flexible Digital Implant Advantage

Design Feature	Advantage
Constructed of UltraSIL	A third generation medical grade Silicon that exhibits improved physical properties when compared to traditionally available materials *
Low Profile Hinge	Allows for free moving anatomic joint flexion
Anatomically Designed Stems	Rectangular proximal stem for canal matching and rotational control. Round stem options are offered in the smaller sizes to accommodate narrow bone anatomy that might otherwise preclude the use of other digital prostheses
Anatomic Hinge Buttress	The anatomic hinge buttresses improve joint function, stability and cosmesis
"Keyhole" Hinge	The opening hinge design evenly distributes stress and provides both strength and flexibility

*Data on file at Tornier, Inc.

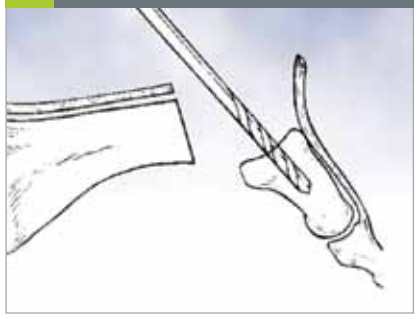
Flexible Digital Implant Surgical Technique

1



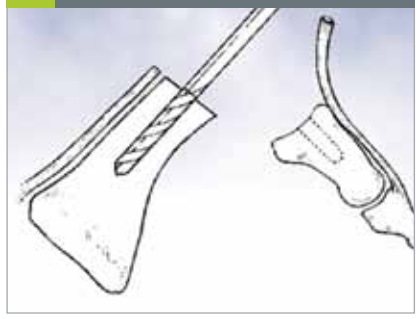
A dorsal longitudinal incision is made over the proximal interphalangeal joint of the digit. The incision is deepened by sharp and blunt dissection around the joint. An extensor tenotomy is performed over the distal shaft of the proximal phalanx and the extensor tendon and joint capsule are carefully dissected distally to the level of the proximal interphalangeal joint, exposing the head of the proximal phalanx. The head of the phalanx is completely freed and the appropriate amount of bone is resected

2



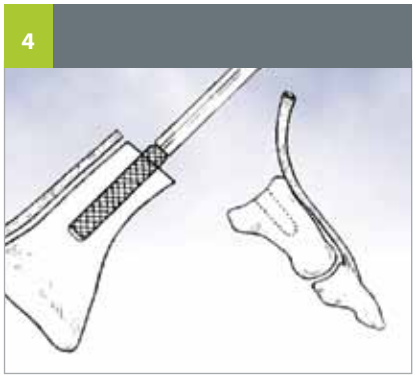
A 2 mm drill is utilized to ream the medullary canals of both the middle and proximal phalanges (Figures 2 and 3). It is helpful to use the 2 mm awl instrument as a center punch in the articular cartilage of the base of the middle phalanx prior to drilling. This will keep the drill point in the desired position

3



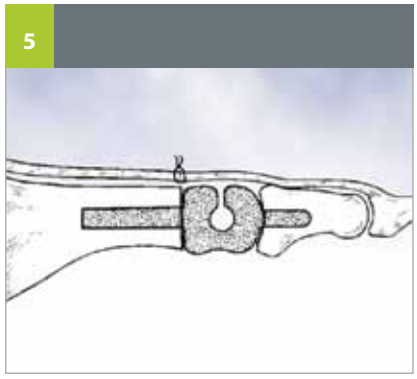
The 2 mm awl may also be used to create a pilot hole in the shaft of the proximal phalanx prior to using the 2 mm drill, or it may be used to manually create the hole in the medullary canal in lieu of using a power drill. For the smallest stemmed implants, sizes 05 and 15, the bone preparation is now complete, since both the proximal and distal stems are round.

4



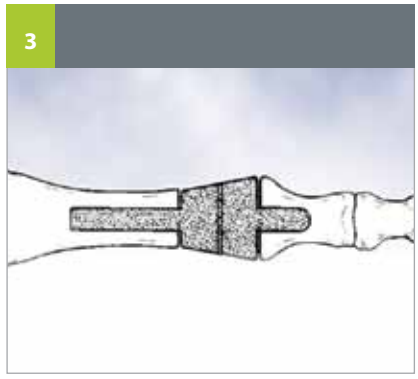
For the larger stemmed implants, an appropriate broach instrument is utilized to create a rectangular hole in the medullary canal of only the proximal phalanx. The size 10 and 20 implants utilize the small broach (2 mm x 2 mm) and the large broach (2 mm x 3 mm) is used for the the size 30 and 40 implants. Color coded trial sizers are included in the instrument tray. There is corresponding color coding on the package of the equivalent size implant.

5

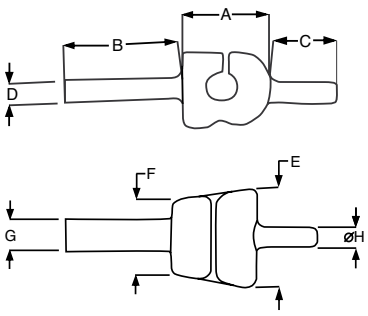


The appropriate size implant is selected, and placed within the joint. It is often easier to reflect the extensor tendon distally and insert the distal stem of the implant first. The proximal stem is then inserted into the proximal phalanx and the extensor tendon is reattached with the joint being held in a corrected position.

3



Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to a traditional digital arthroplasty procedure.



		IMPLANT SIZER							
CAT #	STEM	A	B	C	D	E	F	G	H
FDI-05		4.7	7.0	4.0	ø2.0	6.6	5.0	2.0	2.0
FDI-10		4.7	7.0	4.0	2.0	6.6	5.0	2.0	2.0
FDI-15		5.8	7.0	4.0	ø2.0	8.1	6.2	2.0	2.0
FDI-20		5.8	7.0	4.0	2.0	8.1	6.2	2.0	2.0
FDI-30		5.8	9.0	5.2	2.0	8.1	6.2	3.0	2.0
FDI-40		6.9	9.0	5.2	2.0	9.7	7.4	3.0	2.0

Forefoot Implant Arthroplasty

The only company to offer a complete line of forefoot joint replacement products. Tornier offers three options to support reconstruction of the first metatarsal phalangeal joint. Other implants for the lesser MP and proximal interphalangeal joints provide full anatomic function.

	Description/Size	Catalog #
Metal Hemi Toe Implant	Metal Hemi Toe Implant Kit	MHT-KIT
	Size 20	MHT-20
	Size 30	MHT-30
	Size 40	MHT-40
Primus Great Toe (w/grommets)	Primus Great Toe Implant Kit	FGT-KIT
	Size 20	FGT-20
	Size 30	FGT-30
	Size 40	FGT-40
	Size 50	FGT-50
Classic Great Toe	Classic Great Toe Implant Kit	CGT-KIT
	Size 20	CGT-20
	Size 30	CGT-30
	Size 40	CGT-40
	Size 50	CGT-50
	Size 60	CGT-60

	Description/Size	Catalog #
Lesser Toe MP Joint	Lesser Toe MP Joint Kit	LMP-KIT
	Size 20	LMP-20
	Size 30	LMP-30
	Size 40	LMP-40
	Size 50	LMP-50
Flexible Digital Implant	Flexible Digital Implant Kit	FDI-KIT
	Size 05	FDI-05
	Size 10	FDI-10
	Size 15	FDI-15
	Size 20	FDI-20
	Size 30	FDI-30
	Size 40	FDI-40

Tornier is pleased to bring you a comprehensive suite of lower extremity products.


StayFuse™


RFS® Screw and Pin


NexFix™ Compression Screw


Futura™ CSI


OsteoCure™ Beads

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Prior to using any Tornier device, please review the instructions for use and surgical technique for a complete listing of indications, contraindications, warnings, precautions, potential adverse events, and directions for use. Part # 19-5001, Part # 19-5021, Part # 19-5014

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