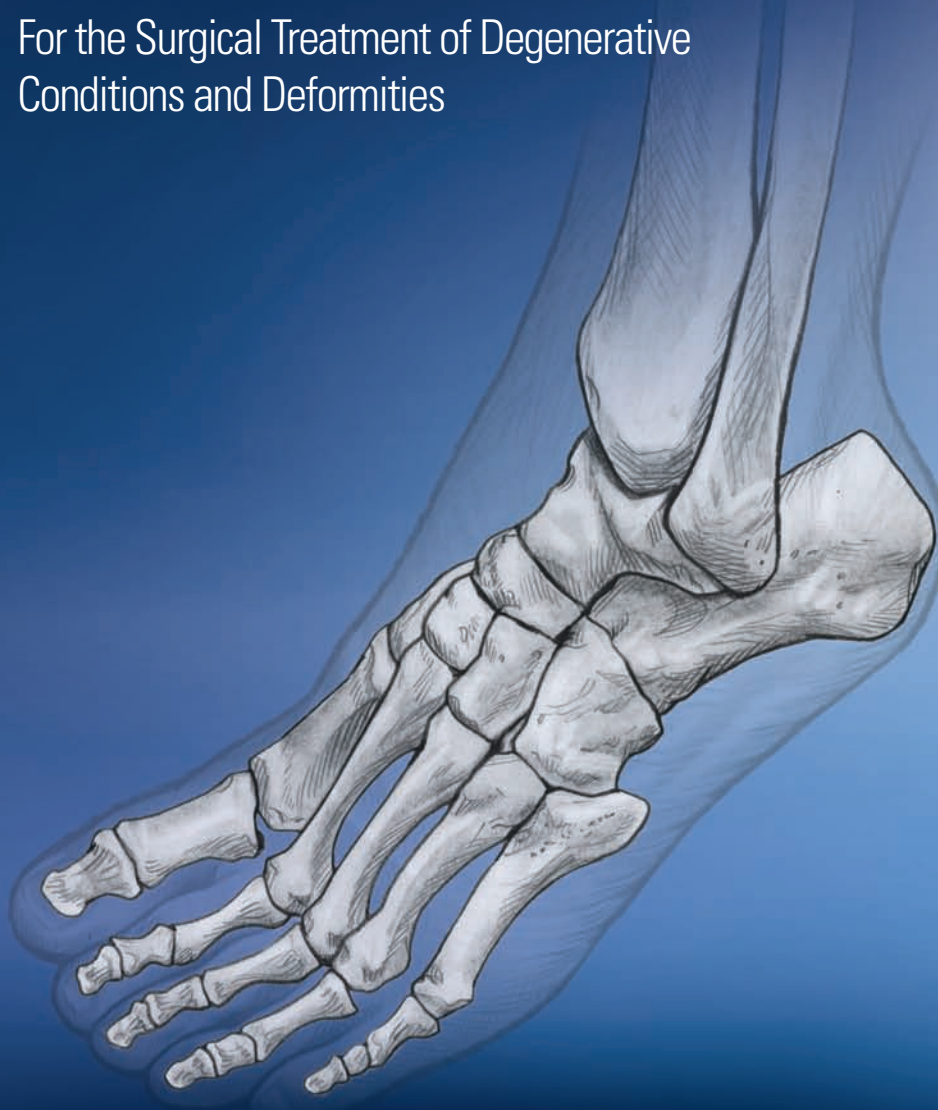




Futura™ Forefoot Implant Arthroplasty Products

For the Surgical Treatment of Degenerative Conditions and Deformities



MHT ▶



Primus ▶



Classic ▶



LMP ▶



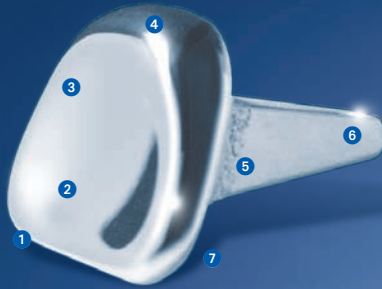
FDI ▶



TORNIER
Specialists Serving Specialists



Metal Hemi Toe Implant



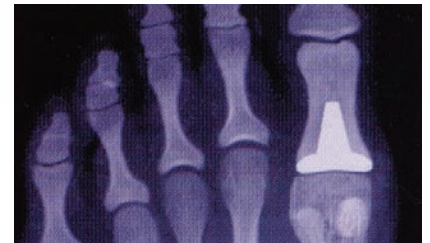
The Metal Hemi Toe (model MHT) is a cobalt chrome, one piece implant for supplementation of first metatarsophalangeal joint arthroplasty.

The MHT replaces the base of the proximal phalanx and provides a smooth articular surface for the adjacent metatarsal head. The intramedullary stem and the surface in contact with the resected base of the proximal phalanx are coated with a titanium plasma spray to encourage osseous integration.

The implant has an anatomic design which helps minimize the complications often seen with metatarsophalangeal joint arthroplasty such as; joint instability, shortening of the hallux, and painful or limited range of motion.



- 1 Thin implant base maintains the anatomic insertion of the flexor hallucis brevis tendon.
- 2 Fabricated from medical grade cobalt-chrome alloy, the material of choice for articular surfaces of weight bearing joints.
- 3 Congruent articular surface matches adjacent metatarsal head.
- 4 Dorsal aspect is rounded to reduce impingement on the metatarsal head.
- 5 Titanium coated stem to encourage osseous integration.
- 6 Trapezoidal stem provides an anatomic fit in the medullary canal.
- 7 Matched to Futura Primus implant should revision to total joint arthroplasty be necessary.



Indications

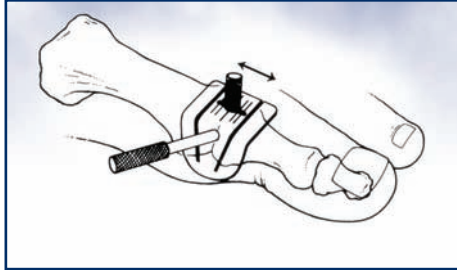
1. Hallux limitus or hallux rigidus.
2. Painful hallux valgus.
3. Revision of failed previous surgery.
4. Painful arthritis.

Contraindications

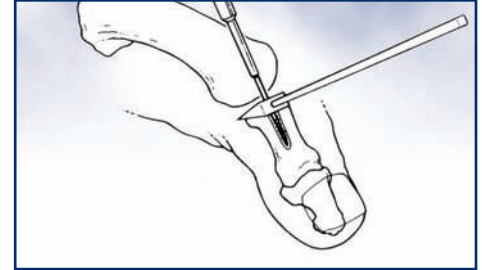
1. Significant bone demineralization.
2. Inadequate neurovascular status.
3. Inadequate skin or musculotendinous system.
4. Psychologically unsuitable patient.
5. Active sepsis.

Metal Hemi Surgical Procedure

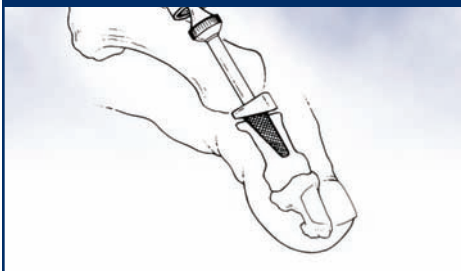
A longitudinal incision is made on the dorsal aspect of the first metatarsal phalangeal joint. The incision is deepened by sharp and blunt dissection to the level of the joint, and the vital structures are retracted. A longitudinal capsulotomy is performed, and the joint is dissected free. All hypertrophic 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.



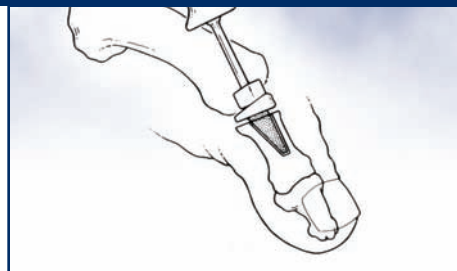
1 The adjustable cutting guide instrument is then utilized to resect the base of the proximal phalanx at the appropriate level. If the joint has been decompressed on the metatarsal side, only a neutral amount of bone is resected from the base of the phalanx, with the adjustable tab on the osteotomy guide 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 3mm.



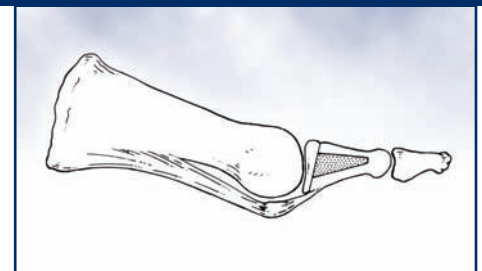
2 The burr guide instrument is positioned so the dorsal edge aligns with the dorsal surface of the proximal phalanx. A pilot hole is then placed in the medullary canal using a rotary burr.



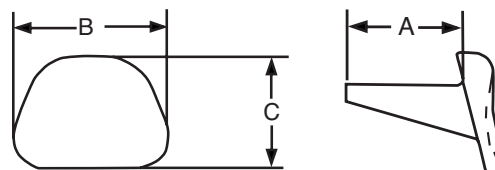
3 The trial sizers are used to select the correct size implant. The broach instrument corresponding to the selected trial size is utilized to complete the preparation of the medullary canal. The broach may be used manually using the handle in the instrument tray, or with a reciprocating power hand piece.



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.



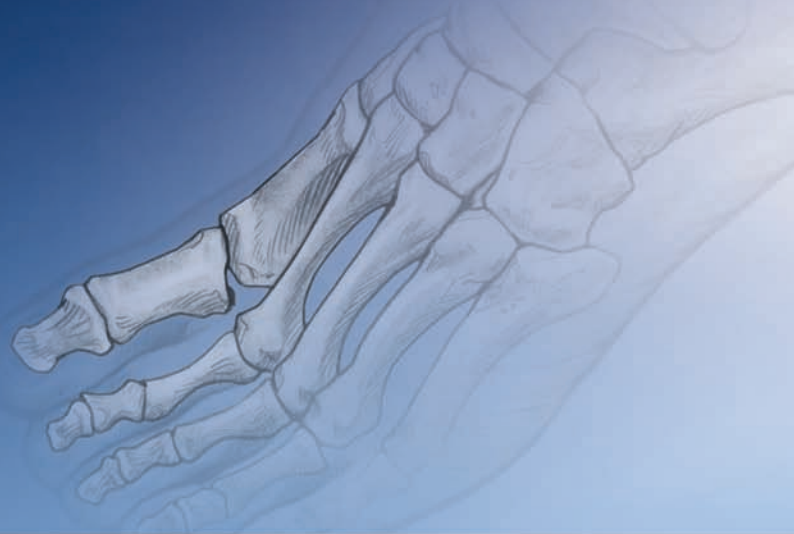
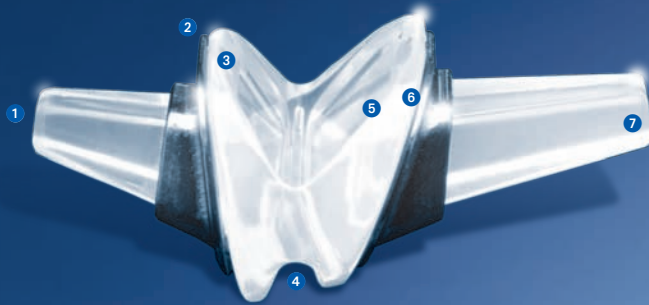
5 Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to other arthroplasty procedures of this joint.



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

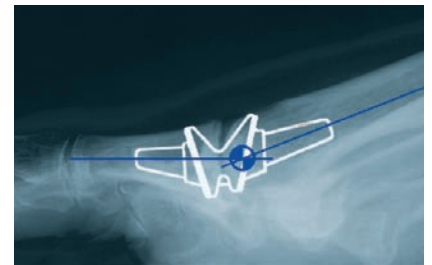


The Primus Flexible Great Toe (model FGT) is a third generation implant for supplementation of first metatarsophalangeal joint arthroplasty. The implant is constructed from UltraSIL™ medical grade silicone elastomer and includes optional titanium grommets.

The Primus is the first double-stemmed implant designed specially for the unique geometry of the first metatarsophalangeal joint. With its dorsal offset metatarsal aspect, the Primus matches the anatomic position of the proximal phalanx relative to the metatarsal.



- 1 Trapezoidal distal stem provides anatomic fit in the intramedullary canal of the phalanx.
- 2 Hinge buttresses designed to match adjacent bone surfaces.
- 3 Unique hinge geometry prevents grommet on grommet contact in dorsiflexion.
- 4 Angled cuts preserve insertion of flexor hallucis brevis tendon.
- 5 Patented axially offset hinge allows for 95° range of motion.
- 6 Titanium grommet option and patented strength rib on inferior aspect of hinge enhance durability.
- 7 Proximal stem is rectangular to match metatarsal intramedullary canal. The stem is angled 15° in the sagittal plane, corresponding to the natural metatarsal declination angle.



Indications

1. Hallux limitus or hallux rigidus.
2. Painful rheumatoid arthritis.
3. Hallux abducto valgus associated with arthritis.
4. Unstable or painful joint from previous surgery.

Contraindications

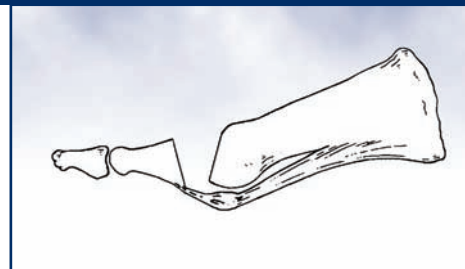
1. Severe bone demineralization.
2. Inadequate neurovascular status.
3. Inadequate skin or musculotendinous system.
4. Inadequate bone stock.
5. Psychologically unsuitable patient.
6. Active sepsis.

Primus Surgical Procedure

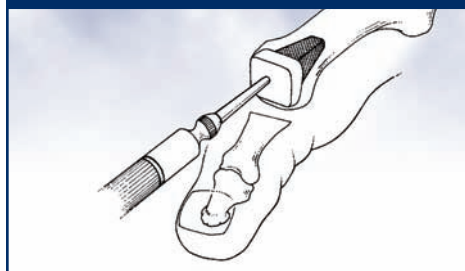
A longitudinal incision is made on the dorsal aspect of the first metatarsophalangeal joint. The incision is deepened by sharp and blunt dissection to the level of the joint, and the vital structures are retracted. A longitudinal capsulotomy is performed, and the joint is dissected free. The base of 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.



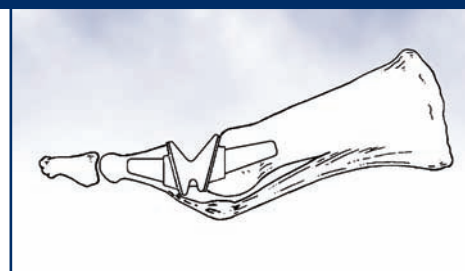
2 After the appropriate angles have been established, the cutting guide is removed and the bone cuts are completed.



3 A pilot hole is then made in the medullary canal of the metatarsal. The trial sizers are used to choose 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.

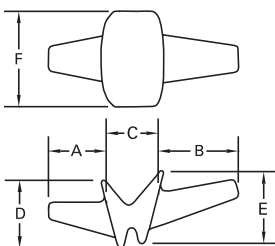


4 When all soft tissue contractures have been released and full range of motion is achieved, the trial sizer is removed and the wound is thoroughly irrigated. If the surgeon elects to use grommets, the grommets are press-fit in place using the grommet impactor instrument. The grommets must seat against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



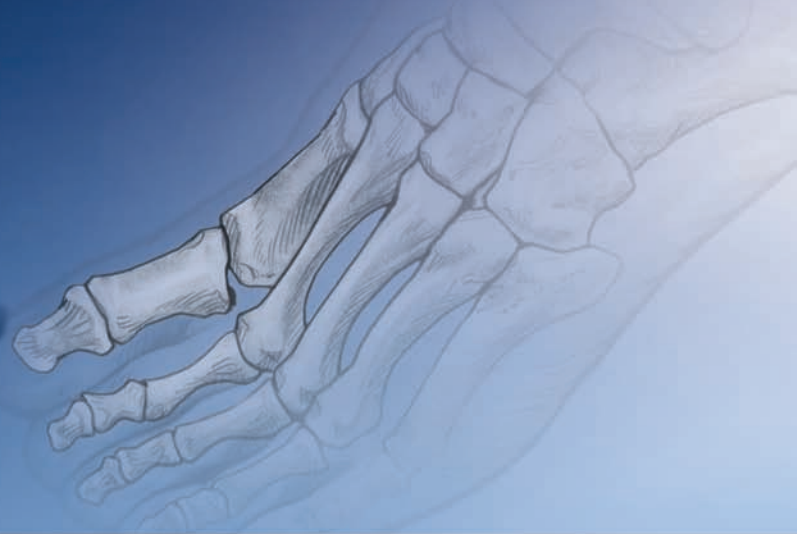
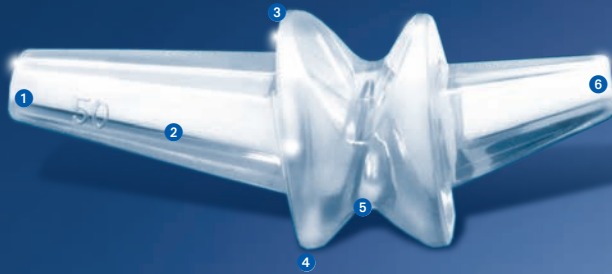
5 The joint capsule is sutured being certain to completely cover the prosthesis. Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to other arthroplasty procedures of this joint.

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.



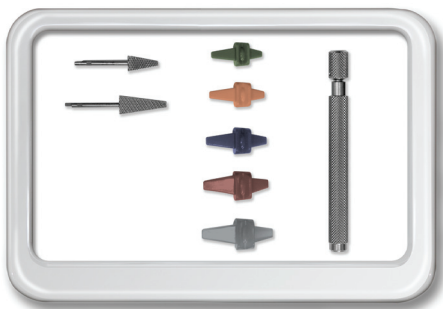
SIZE (mm)	A	B	C	D	E	F
FGT-20	9.9	13.7	8.9	11.6	12.3	16.3
FGT-30	9.9	13.7	9.9	12.7	13.5	18.0
FGT-40	11.9	16.7	10.9	14.0	14.9	19.8
FGT-50	11.9	16.7	12.0	15.3	16.3	21.6

Classic Great Toe Implant



The Classic Flexible Great Toe (model CGT) is a third generation silicone implant for supplementation of first metatarsophalangeal joint arthroplasty. The implant is constructed from UltraSIL™ advanced elastomer in five sizes.

The Classic is a double-stemmed implant incorporating an axial offset hinge designed to match the anatomic position of the proximal phalanx relative to the metatarsal.



- 1 Proximal stem angled 15° in the sagittal plane corresponding with natural metatarsal declination angle.
- 2 Proximal stem is a rectangular shape for an anatomic fit in the medullary canal of the metatarsal.
- 3 Anatomically correct axial offset hinge. Metatarsal side is higher than phalanx side.
- 4 Vertical bone cuts eliminate cutting guide instrumentation.
- 5 Patented strength rib on inferior aspect of hinge.
- 6 Trapezoidal distal stem provides an anatomic fit in the medullary canal of the phalanx.

Indications

1. Hallux limitus or hallux rigidus.
2. Painful rheumatoid arthritis.
3. Hallux abducto valgus associated with arthritis.
4. Unstable or painful joint from previous surgery.

Contraindications

1. Severe bone demineralization.
2. Inadequate neurovascular status.
3. Inadequate skin or musculotendinous system.
4. Inadequate bone stock.
5. Psychologically unsuitable patient.
6. Active sepsis.

Classic Surgical Procedure

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.



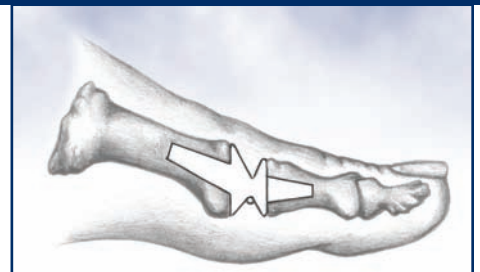
2 The resection of the phalanx base may detach the flexor hallucis brevis tendon. If this occurs, the surgeon should consider performing a flexor tenodesis procedure to maintain functional stability of the joint. A hole is drilled at the inferior aspect of the stump of the proximal phalanx. The flexor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



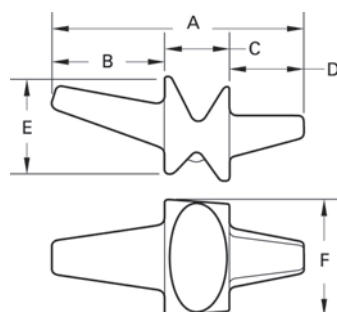
3 The flexor hallucis brevis tendon is then sutured to the tendon of the flexor hallucis longus, with the sesmoids in a natural position.



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

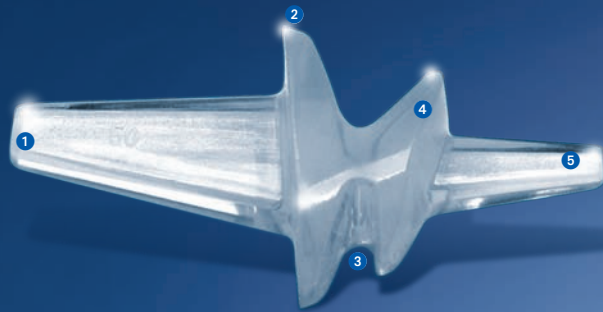


5 Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to other arthroplasty procedures of this joint.



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 (model LMP) is a third generation silicone implant for supplementation of lesser metatarsophalangeal joint arthroplasty. Constructed from UltraSIL™ medical grade silicone elastomer, the LMP is available in four sizes.

The implant features anatomic hinged buttresses, and rectangular stems designed to fit the medullary canals of the metatarsal and proximal phalanx.



- 1 Vertical proximal stem matches the anatomy of the metatarsal.
- 2 Bone resection on metatarsal head is vertical to weight bearing surface eliminating need for cutting guide instrument.
- 3 Hinge design allows for excellent range of motion.
- 4 Bone resection is rarely needed on phalanx base, as distal buttress is anatomically contoured.
- 5 Distal stem is oriented horizontally corresponding to the base of the proximal phalanx.

Indications

1. Avascular necrosis of a lesser metatarsal phalangeal joint (Kohler's Disease).
2. Partial or complete dislocation of a lesser metatarsal phalangeal joint.
3. Painful arthritis of a lesser metatarsophalangeal joint.
4. Revision of failed previous surgery
5. Hammertoe deformity where the proximal phalanx is dorsally located on the metatarsal in a fixed contracted state.

Contraindications

1. Severe bone demineralization.
2. Inadequate neurovascular status.
3. Inadequate skin or musculotendinous system.
4. Inadequate bone stock.
5. Psychologically unsuitable patient.
6. Active sepsis.

LMP Surgical Procedure



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.



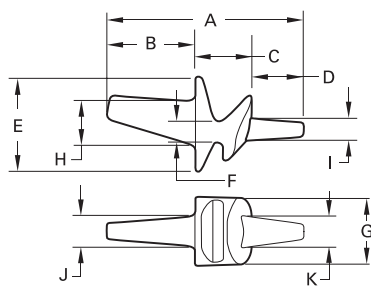
3 The trial sizers are used to select the correct size implant, and to be certain that all soft contractures have been released. It is important to load the foot with the trial sizer in place to be certain there is no jamming of the implant.



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



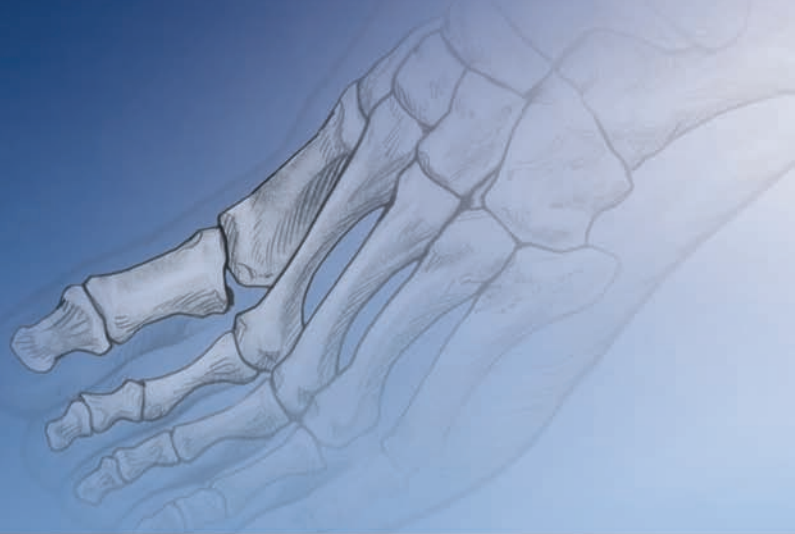
5 The joint capsule is sutured being certain to completely cover the prosthesis. Wound closure is performed with suture of the surgeon's choice. Bandaging and post-operative management corresponds to other arthroplasty procedures of this joint.



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 (model FDI) offers an alternative to traditional arthroplasty or arthrodesis for the correction of a hammertoe deformity.

The Flexible Digital Implant is designed for the proximal interphalangeal joints of digits two through five of the lower extremities, and is constructed from UltraSIL™ medical grade silicone.

The features include an anatomic design based on extensive radiographic analysis and a low profile hinge to minimize the possibility of unnatural protrusion of the implant.



- 1 Rectangular proximal stem is designed to provide additional rotational stability. The smallest size implants are available with round proximal stems which are easily seated using only a standard 2 mm drill hole. This allows for utilization of a prosthesis in many bones that would otherwise be too small to accept implants.
- 2 The hinge buttresses are designed to match the geometry of the bones after the head of the proximal phalanx has been resected.
- 3 The proximal buttress tapers to meet the proximal phalanx shaft.
- 4 Opening hinge design provides flexibility for the joint.
- 5 The hinge is designed with a circular hinge to evenly distribute stress and provide both strength and flexibility.
- 6 The distal buttress is convex to match the concaved base of the middle phalanx.
- 7 The distal stem is designed to fit any sized middle phalanx.

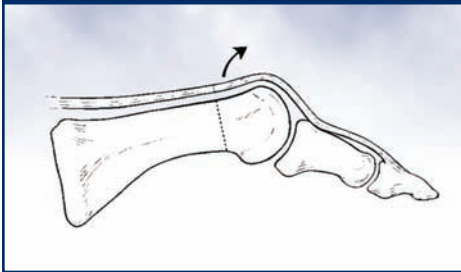
Indications

1. Hammertoe deformity of the lesser digits.
2. Osseous deformity of the proximal interphalangeal joint.
3. Degenerative or traumatic arthritis.
4. Rheumatoid arthritis.
5. Revision of failed previous surgery.

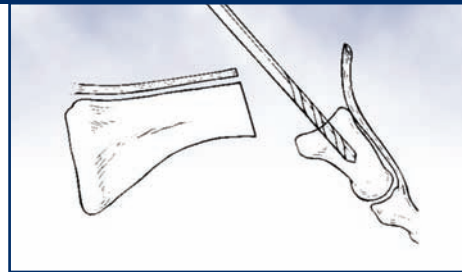
Contraindications

1. Inadequate bone stock.
2. Inadequate neurovascular status.
3. Inadequate skin or musculotendinous system.
4. Psychologically unsuitable patient.
5. Active sepsis.

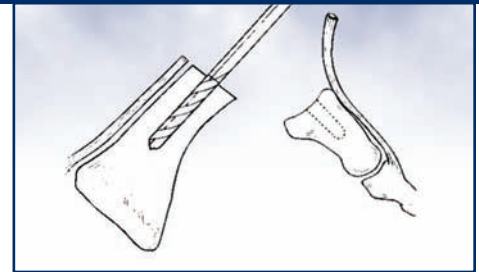
Flexible Digital Surgical Procedure



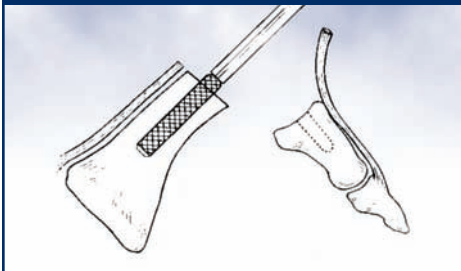
1 A dorsal longitudinal incision is made over the proximal interphalangeal joint of the digit. The incision is deepened by sharp and blunt dissection around the joint. An extensor tenotomy is performed over the distal shaft of the proximal phalanx and the extensor tendon and joint capsule are carefully 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.



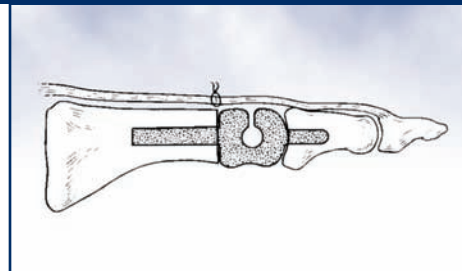
2 A 2 mm drill is utilized to ream the medullary canals of both the middle and proximal phalanges (Figures 2 and 3). It is helpful to use the 2 mm awl instrument as a center punch in the articular cartilage of the base of the middle phalanx prior to drilling. This will keep the drill point in the desired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



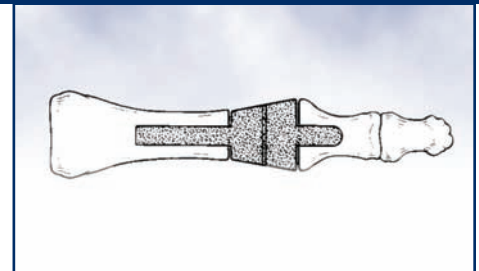
3 The 2 mm awl may also be used to create a pilot hole in the shaft of the proximal phalanx prior to using the 2 mm drill, or it may be used to manually create the hole in the medullary canal in lieu of using a power drill. For the smallest stemmed implants, sizes 05 and 15, the bone preparation is now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



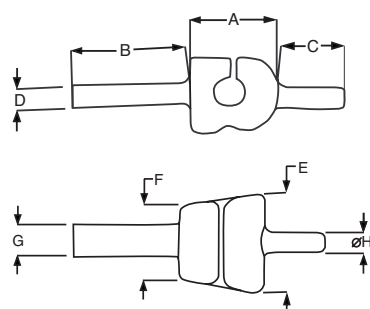
4 For the larger stemmed implants, an appropriate broach instrument is utilized to create a rectangular hole in the medullary canal of only the proximal phalanx. The size 10 and 20 implants utilize the small broach (2 mm x 2 mm) and the large broach (2 mm x 3 mm) is used for the size 30 and 40 implants. 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.



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



CAT. #	STEM	IMPLANT SIZER							
		A	B	C	D	E	F	G	H
FDI-05	●	4.7	7.0	4.0	∅2.0	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	∅2.0	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

Futura™ Forefoot Implant Arthroplasty Products



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.

Metal Hemi Toe Implant



Description/Size	Catalog #
Metal Hemi Toe Implant Kit	MHT-KIT
Size 20.....	MHT-20
Size 30.....	MHT-30
Size 40.....	MHT-40

Primus Great Toe (w/grommets)



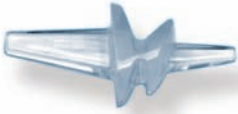
Primus Great Toe Implant Kit.....	FGT-KIT
Size 20.....	FGT-20
Size 30.....	FGT-30
Size 40.....	FGT-40
Size 50.....	FGT-50

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

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

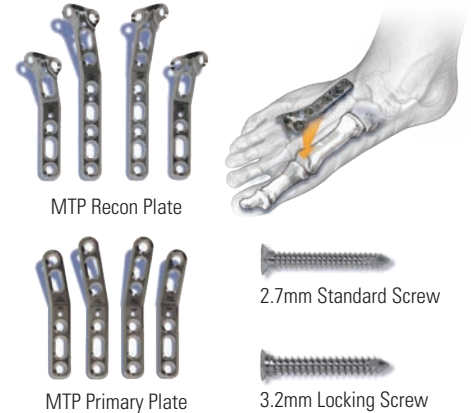


Flexible Digital Implant Kit.....	FDI-KIT
Size 05.....	FDI-05
Size 10.....	FDI-10
Size 15.....	FDI-15
Size 20.....	FDI-20
Size 30.....	FDI-30
Size 40.....	FDI-40

Also available from Tornier...

NexFix™ MTP Fusion Plate

Locking Screw Technology for First MTP Arthrodesis



The NexFix™ MTP Fusion System is a bone plate and screw system for first Metatarsophalangeal (MTP) joint arthrodesis. The combination of plates and screws provides a stiff and stable construct, and allows the hallux to be fused in the proper anatomic alignment.

MTP Primary Plate

Left, Size 2.....	MTP-PS2L	Right, Size 2 ..	MTP-PS2R
Left, Size 3.....	MTP-PS3L	Right, Size 3 ..	MTP-PS3R

MTP Recon Plate

Left, Size 2.....	MTP-RS2L	Right, Size 2 .	MTP-RS2R
Left, Size 3.....	MTP-RS3L	Right, Size 3 .	MTP-RS3R

2.7mm Standard Screw

12mm.....	MTP-2712	20mm.....	MTP-2720
14mm.....	MTP-2714	24mm.....	MTP-2724
16mm.....	MTP-2716	28mm.....	MTP-2728
18mm.....	MTP-2718		

3.2mm Locking Screw

12mm.....	MTP-3212	18mm.....	MTP-3218
14mm.....	MTP-3214	20mm.....	MTP-3220
16mm.....	MTP-3216		

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Waalwijk, Netherlands

