

CHI[®]

Cannulated Hemi Implants

1ST MPJ ARTHROPLASTY



VILEX

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Cannulated Hemi Implants

Design Rationale

Pain of the great toe joint often leads to altered lifestyles. The goal of MPJ implant arthroplasty is to stop the degeneration of cartilage, which is the source of pain, and enable the patient to return to an active lifestyle.

Cannulated hemi implants are designed to resurface the phalangeal base or the metatarsal head. The use of Vilex cannulated hemi implants offer the patient and surgeon options for future care, including fusion, if necessary. Cannulation offers reproducible ease of use, proper placement, simplifies removal, and reduces trauma to the patient.

Vilex implants are designed to minimize the amount of bone resected at phalangeal base or metatarsal head, preserve tendon attachment and important intrinsic muscles which help to restore normal joint kinematics.

Implants are manufactured from chromium cobalt and the articular surfaces are mirror-finished to minimize friction. CHI implants manufactured from titanium alloy are available for patients with nickel allergy.

The congruent surfaces of the implants are shaped to mimic the radial curve of the proximal phalangeal base or metatarsal head in order to maintain range of motion.

The unique design of the implant facilitates stabilization within the medullary canal and is designed to reduce migration in normal bone. The large diameter of the shaft make Vilex Cannulated Hemi Implants ideal for revision and replacing failed implant prosthesis.

Often, the appropriate surgical approach in a 1st MPJ arthroplasty is not confirmed until the joint is surgically exposed. The Vilex Cannulated Hemi Implant System facilitates intraoperative decision making, providing the surgeon with two surgical options in one tray. Five sizes of phalangeal (base) or a metatarsal (head) implants are available.

INDICATIONS FOR USE

The CHI[®] Cannulated Hemi Implants are indicated for hallux limitus, hallux rigidus, or stiff joint; pain due to impacted joint; joint deterioration.



1 Surgically expose the joint

Make a longitudinal incision on the dorsal aspect of the metatarsal-phalangeal joint beginning proximal to the metatarsal head and extending to the diaphysis of the proximal phalanx. The incision is deepened to the level of the joint with sharp and blunt dissection while avoiding the extensor tendon and retracting neurovascular structures. Perform a longitudinal capsulotomy to expose the joint. Resect all hypertrophic bone from both the metatarsal and phalangeal base. The metatarsal head or phalangeal base should be completely freed of its attachments on the medial and lateral aspects.

Depending on the condition of the joint, the surgeon has the option to replace either the head of the metatarsal or the base of the phalanx, but not both. If both ends are equally damaged, Vilex recommends the replacement of the base of the phalanx. If the metatarsal head is not salvageable, the head should be replaced. If the bone is extremely cystic or osteoporotic, joint fusion may be considered.

NOTE: *Under no circumstance should both ends of a joint be replaced. Without any condition or equivocation Vilex does not recommend the replacement of both the base of the phalanx and the metatarsal head of the same joint.*

2

Prepare the bone surface

CHI Phalangeal (Base)



For phalangeal hemi implants, the phalangeal base is resected perpendicular to the shaft. The cut should be neutral without lateral or medial orientation. A slight dorsal-plantar inclination is desirable. The width of the resected bone should be 4-5 mm to allow room for the implant and to decompress the joint, roughly twice the thickness of the implant. When dissecting the base of the phalanx from the shaft, care must be taken to preserve the FHL and FHB tendon attachment. Ensure adequate bone resection of the proximal phalanx and dorsal metatarsal head to allow normal motion.

CMHI Metatarsal (Head)



For metatarsal head implants, the distal head is resected at the appropriate level. The resection line should bypass any tendon or critical tissue. The cut should be neutral without lateral or medial orientation. A slight dorsal-plantar inclination is desirable. The width of the resected bone should be 5-6.5mm to allow room for the implant and to decompress the joint. Note that more bone is resected for a metatarsal head implant, roughly 1-1.5mm more than the thickness of the implant, which ranges between 4 and 5mm, depending on implant size.



SURGICAL TIP

If significant elevatus of the first metatarsal is present, the implant may fail. It is suggested that a metatarsal osteotomy be performed along with the arthroplasty to correct the biomechanics caused by the genetic defect at the metatarsal head when an implant is used at the base of the phalanx (CHI). If a metatarsal head implant is used (CMHI), proper surgical planning should be considered to allow adequate healing of an arthrodesis.

3 Determine implant size

After the base or metatarsal head is resected, place the cannulated Vilex trial sizer (CHI elliptical / CMHI circular) over the exposed surface to determine the correct size of the prosthesis. The sizer should cover the cortical margins of the surface without protruding beyond the bone.



SURGICAL TIPS

An implant which is too small will "bulldoze" over time into the medullary canal, and an implant too large will be palpable through the skin.

For base implants (CHI), once the appropriate size implant has been selected, the surgeon may utilize the implant as a guide to ensure congruent fit. To do so, turn the implant upside down on the proximal phalanx and place the wire into the shaft using the implant as a guide. Once the wire is driven into the phalanx at least 3cm the implant can be removed from the guide. Place the implant down the guide wire in its correct position.

4 Insert guide wire

For both the base (shown) and the metatarsal head
With the sizer in position, manually insert a guide to mark the center. Remove the sizer and drive the wire into the canal, making sure the wire is in the center parallel to the axis of the bone. It is recommended an intraoperative x-ray after the guide wire is inserted to ensure proper placement.

NOTE: The 4.5mm cannulated drill may be used if stock is encountered



5 Implantation

Select the implant that corresponds to the sizer. Using the driver, insert the cannulated implant over the guide wire.

NOTE: The titanium base implants and sizers are linked through color coding for easy recognition.



ADVANCING THE IMPLANT

For both the base (shown) and the metatarsal head:

Align the pins of the driver into the drive holes of the implant. Drive the implant into the intramedullary canal. Seat the implant such that the surface of the implant is flush with the bone.

NOTE: Hemi implants are available with HA coating

ORIENTING THE IMPLANT

The surgeon may adjust the orientation of the implant by turning it as much as one half turn. Using the AO technique: Two turns clockwise, ½ turn counter clockwise will allow the implant to seat and align with no difficulty. Continue this process until the implant is properly oriented. Care should be taken not to over-tighten the implant.



6 Remove the guide wire

After implanting the implant, remove the guide wire. Obtain an intraoperative x-ray to evaluate final position of the implant.

7 Assess range of motion

Hold firm the first metatarsal with one hand and with the other put the hallux through ROM. Simulate weight bearing by pushing up the first metatarsal and then putting hallux through ROM. Motion on the table is generally the most that will be obtained. Check the ROM for impingements and restrictions.



Phalangeal Base Arthroplasty



Pre-op



Post-op

Metatarsal Head Arthroplasty



Item Listing

VILEX P/N	DESC	CASE QTY	TYPE
CHI-1	Cannulated Hemi Implant (Phalangeal Base) 13x15, #1	2	Implant
CHI-2	Cannulated Hemi Implant (Phalangeal Base) 15x17, #2	2	Implant
CHI-3	Cannulated Hemi Implant (Phalangeal Base) 17x19, #3	2	Implant
CHI-4	Cannulated Hemi Implant (Phalangeal Base) 19x22, #4	2	Implant
CHI-5	Cannulated Hemi Implant (Phalangeal Base) 21x24, #5	2	Implant
CMHI-14	Cannulated Hemi Implant (Metatarsal Head) 14mm, #1	2	Implant
CMHI-16	Cannulated Hemi Implant (Metatarsal Head) 16mm, #2	2	Implant
CMHI-18	Cannulated Hemi Implant (Metatarsal Head) 18mm, #3	2	Implant
CMHI-20	Cannulated Hemi Implant (Metatarsal Head) 20mm, #4	2	Implant
CMHI-22	Cannulated Hemi Implant (Metatarsal Head) 22mm, #5	2	Implant
M1SZ-1315	CHI & CMHI Sizer, #1	1	Instrument
M1SZ-1517	CHI & CMHI Sizer, #2	1	Instrument
M1SZ-1719	CHI & CMHI Sizer, #3	1	Instrument
M1SZ-1922	CHI & CMHI Sizer, #4	1	Instrument
M1SZ-2124	CHI & CMHI Sizer, #5	1	Instrument
HANDLE	Quick Connect Handle	1	Instrument
X620-16	1st Phalangeal Driver Shaft	2	Instrument
X620-16-13	1st Metatarsal Driver Shaft	2	Instrument
Z410-150-45	Cannulated Drill, Quick Connect 4.5x150mm	1	Instrument
Z720-16	Guide Wire Holder for 1.6mm Wire	1	Instrument
K100-16S	Wire, Single Trocar, 1.6mm X 100mm	1	Instrument

CUSTOMIZABLE TRAYS

All metatarsal head implants are manufactured from cobalt chrome.

1st MPJ Systems are customizable to include base implants (CHI) manufactured from cobalt chrome with hydroxyapatite coating, or color-coded anodized titanium.



MPJ BASE (ELLIPTICAL)

PRODUCT NO.	MATERIAL	APPEARANCE	DIMENSIONS (MM)	STEM LENGTH	STEM DIAMETER	IMPLANT THICKNESS	RESECTION THICKNESS (2X IMPLANT THICKNESS)
CHI-1C	Cobalt Chrome	Silver	13 x 17	9.0	6.5	1.0	2.0
CHI-2C	Cobalt Chrome	Silver	15 x 19	10.0	6.5	2.0	4.0
CHI-3C	Cobalt Chrome	Silver	16 x 20.5	11.0	7.5	2.1	4.2
CHI-4C	Cobalt Chrome	Silver	17 x 22	12.0	7.5	2.2	4.4
CHI-5C	Cobalt Chrome	Silver	18 x 24	13.0	7.5	2.3	4.6
CHI-1T	Titanium	Dark Blue	13 x 17	9.0	6.5	1.0	2.0
CHI-2T	Titanium	Gold	15 x 19	10.0	6.5	2.0	4.0
CHI-3T	Titanium	Magenta	16 x 20.5	11.0	7.5	2.1	4.2
CHI-4T	Titanium	Green	17 x 22	12.0	7.5	2.2	4.4
CHI-5T	Titanium	Bronze	18 x 24	13.0	7.5	2.3	4.6

U.S. Patent No. 7,959,681

MPJ HEAD (ROUND)

PRODUCT NO.	MATERIAL	APPEARANCE	DIMENSIONS (MM)	STEM LENGTH	STEM DIAMETER	IMPLANT THICKNESS	RESECTION THICKNESS (THICKNESS + 1.5MM)
CMHI-14	Cobalt Chrome	Silver	14.0	8.5	6.5	4.0	5.5
CMHI-16	Cobalt Chrome	Silver	16.0	10.0	6.5	4.0	5.5
CMHI-18	Cobalt Chrome	Silver	18.0	11.0	6.5	5.0	6.5
CMHI-20	Cobalt Chrome	Silver	20.0	12.0	7.5	5.0	6.5
CMHI-22	Cobalt Chrome	Silver	22.0	13.0	7.5	5.0	6.5

Custom Options

C=Cobalt Chrome

CH = Cobalt Chrome with Hydroxyapatite Coating (HA)

T=Titanium

TH=Titanium with Hydroxyapatite Coating (HA)



ADVANCE WITH US >>>

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