

SURGICAL TECHNIQUE

Silicone MCP / PIP Implant Systems



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SMALL BONE INNOVATIONS, INC.

Silicone MCP / PIP Implant Systems

SURGICAL TECHNIQUE

CONTENTS

Introduction	1
MCP / PreFlex Surgical Technique	
1. Incision And Exposure	2
2. Metacarpal Resection and Implant Sizing	2
3. Metacarpal Preparation	3
7. Proximal Phalanx Preparation	3
8. Trial Reduction And Implant Placement	3
9. Closure	3
PIP Surgical Technique: Lateral Approach	
1. Incision And Exposure	4
2. Phalanges Preparation	5
3. Broaching The Canals	5
4. Trial Reduction And Implant Placement	5
PIP Surgical Technique: Dorsal Approach	
1. Incision And Exposure	6
2. Phalanges Preparation	6
3. Broaching The Canals	7
4. Trial Reduction And Implant Placement	7
Specifications	8
Indications and Contraindications	9

Introduction

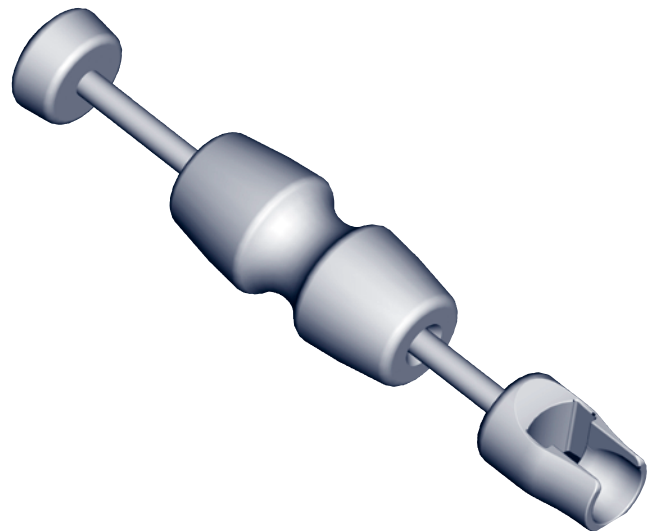
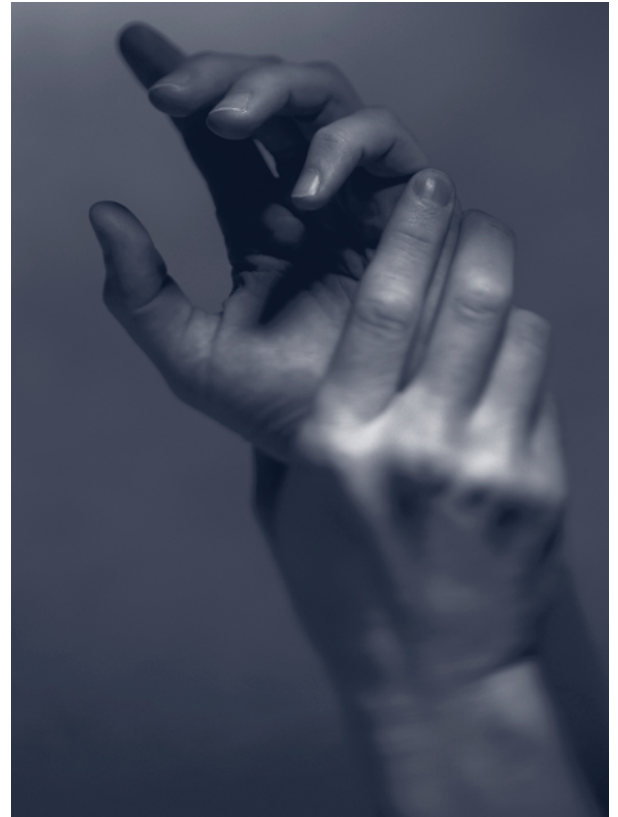
The following surgical techniques are provided for information purposes only. Each surgeon must evaluate the appropriateness of the procedures based on his or her own surgical training and experience.

Product Handling

Handling of the implants should be minimized, with special attention paid to avoiding contact with surgical glove powder and sharp instruments. Use of double or triple antibiotic solution may also be considered. Silicone elastomer sizers develop a static charge which attracts particulate matter. Sizers may be kept in a sterile saline solution to minimize particulate pickup.

Slap Hammer

The slap hammer included with the instrument set is designed to aid in the surgeon in the broaching of the intramedullary canals. To utilize, place the round bottom end of the broach into the slot at the top of the hammer and rotate to lock into place.



MCP / PREFLEX SILICONE
SURGICAL TECHNIQUE

SURGICAL PROCEDURE

1 Incision And Exposure

A skin incision is made over the necks of the metacarpal bones. This incision can be a single transverse incision, or two longitudinal incisions, one between the second and third metacarpals and the other between the fourth and fifth metacarpals (**FIGURE 1**).

A blunt dissection is performed to expose the extensor tendons. Care is taken to protect the dorsal veins and digital nerves. The extensor tendon is dissected from the hood and reflected to the radial side of the joint. The collateral ligaments are detached, the joint is exposed, and the head of the metacarpal is identified.

2 Metacarpal Resection And Implant Sizing

The metacarpal head is resected along with hypertrophied synovial material (**FIGURE 2**).

Based on the resected metacarpal bone the implant size to be used should be estimated using the color coded sizers. The optimum implant size will provide good coverage of the metacarpal bone without overhanging. Good coverage is important as it will help prevent volar impingement of the bone and provide greater range of motion.

FIGURE 1

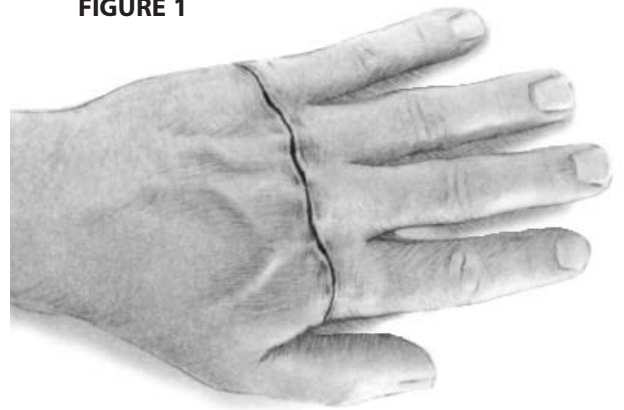
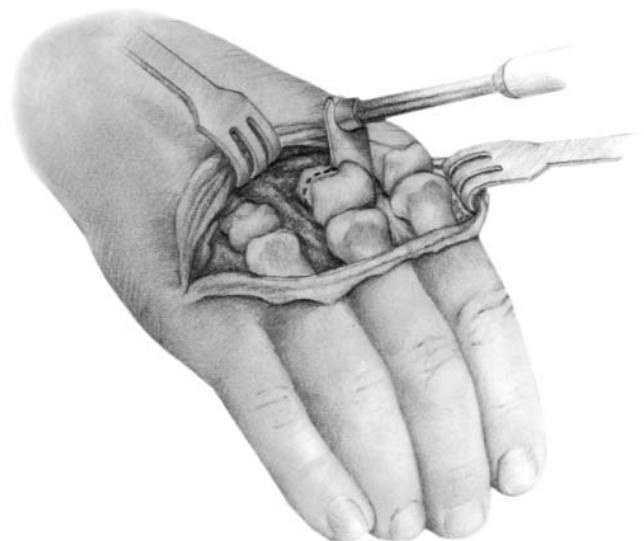


FIGURE 2



3 Metacarpal Preparation

The metacarpal canal preparation may be initiated using the starter awl provided with the instruments. Use the metacarpal broaches sequentially up to the size previously determined. Broaches should be inserted to a depth corresponding to the end of the tapered section of the bit. Do not rotate the bit back and forth as this will distort the canal and allow movement of the implant. Be sure that the dorsal mark on the broach handle faces the dorsal surface of the bone (**FIGURE 3**).

4 Proximal Phalanx Preparation

Although resection of the proximal phalanx is not typically required, be sure that the shoulder of the implant has a good seating surface. Remove any osteophytes which may interfere with the implant.

As on the metacarpal side, start to open the phalangeal canal with the starter awl. Use the phalangeal broaches sequentially to the appropriate size. Any sharp points or rough surfaces on the bone ends should be made completely smooth.

5 Trial Reduction And Implant Placement

Using the appropriate color coded sizer, do a trial reduction. Check for tightness, coverage and for volar impingement in full flexion. Unlike other implants of this type, the MCP does not need to be put in as tight as possible.

Once the proper size has been established, smooth forceps are used to insert the implant (**FIGURE 4**). Care is taken not to nick or cut the prosthesis. The metacarpal stem of the implant is inserted first followed by insertion of the proximal phalanx stem. A final range of motion is performed to verify adequate joint mobility.

6 Closure

If necessary, ligament and tendon reconstruction and alignment are done at this time. Proper balance of the collateral ligaments, palmar plate, capsule, intrinsic tendons, flexor and extensor mechanism is crucial. The incision is closed in the usual manner.

FIGURE 3



FIGURE 4



PIP SILICONE
SURGICAL TECHNIQUE

SURGICAL PROCEDURE: LATERAL APPROACH

1 Incision And Exposure

A lateral approach is recommended for surgeons comfortable with this technique, except in those subjects who require reconstruction of the extensor mechanism due to boutonniere deformity or swan neck deformity. The advantages of the lateral approach include early range of motion without concern for damage to the extensors.

A mid-axial incision is made on either the ulnar or radial side of the finger. One may want to consider a radial approach for arthroplasties of the index and long finger and an ulnar approach for the ring and little fingers (**FIGURE 1**). The lateral band is retracted dorsally on the side of the incision after incising the transverse retinacular ligament. This allows the collateral ligament to be exposed. The collateral ligament is detached from the proximal phalanx retaining a small portion of the periosteum to facilitate later reattachment (**FIGURE 1A**).

Contractures or adhesions of the volar plate or dorsal capsule are released, if necessary.

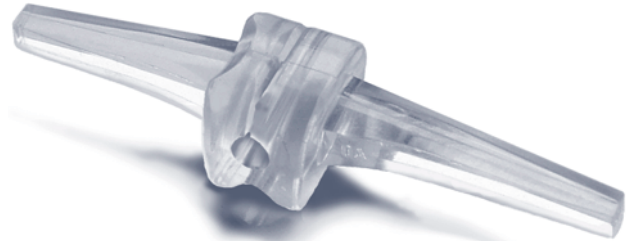


FIGURE 1

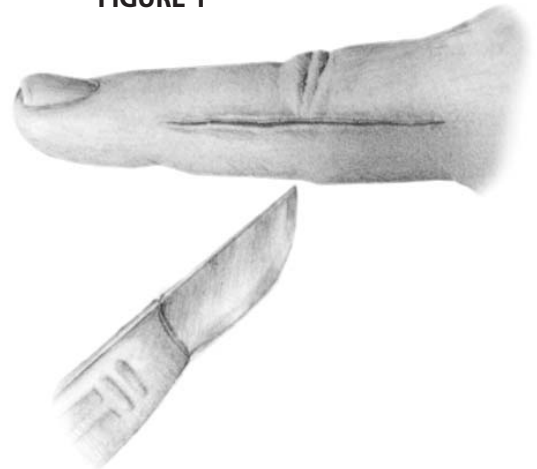
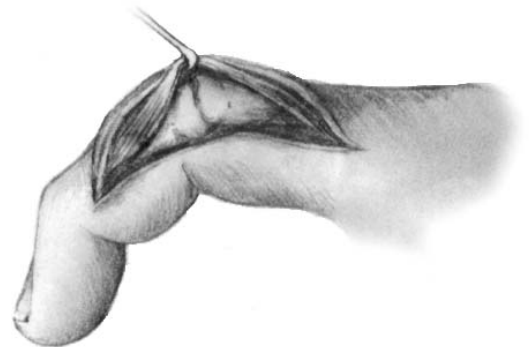


FIGURE 1A



2 Phalanges Preparation

The proximal phalanx is cut transversely, just proximal to the head of the bone (**FIGURE 2**). This may be done with an oscillating saw or osteotome. The head is removed by stripping off the remaining collateral ligament. The articular surface of the middle phalanx is contoured to provide a surface against which the implant will be flush. This allows the buttress of the implant to fit against the bone while allowing the dorsal extension mechanism to remain intact.

The phalanges are distracted at an angle which allows for excision of synovium, trimming of osteophytes, and reaming of the phalanges.

Based on the resected phalangeal bone the implant size to be used should be estimated at this time using the color coded sizers. The optimum implant size will provide good coverage of the phalangeal bone without overhanging. Good coverage is important as it will help prevent volar impingement of the bone and provide greater range of motion.

3 Broaching The Canals

The middle phalangeal canal preparation may be started using the starter awl provided with the instruments.

Use the middle phalangeal broaches sequentially to the size previously noted. Broaches should be inserted to the end of the tapered section of the bit. Do not rotate the bit back and forth as this will distort the canal and allow movement of the implant. Be sure that the dorsal mark on the broach handle faces the dorsal surface.

As on the middle phalangeal side, start to open the proximal canal with the starter awl. Use the proximal phalangeal broaches sequentially to the appropriate size.

4 Trial Reduction And Implant Placement

Using the appropriate color coded sizer, do a trial reduction. Check tightness coverage and for volar impingement in full flexion. Unlike other implants of this type, the PIP does not need to be put in as tight as possible (**FIGURE 4**).

Once the proper size has been established, smooth forceps are used to insert the implant. Care is taken not to nick or cut the prosthesis. The proximal phalanx stem is inserted first and then the middle phalanx stem is inserted. A final range of motion is performed to verify adequate joint mobility. The implant should be well seated but not compressed.

The collateral ligaments are reattached and the incision is closed in the usual manner.



FIGURE 2



FIGURE 4

SURGICAL PROCEDURE: DORSAL APPROACH

1 Incision And Exposure

A dorsal skin incision is made just distal to the metacarpophalangeal joint extending distally to the middle phalanx. The dorsal veins are respected and the incision is carried down to the extensor mechanism (FIGURE 1).

The extensor mechanism is exposed and incised longitudinally from its insertion at the base of the middle phalanx through the distal two-thirds of the proximal phalanx, taking care not to detach the insertion of the central slip. The extensor mechanism can be gently dislocated to either side as the joint is flexed without disturbing the insertion of each half of the central tendon into the middle phalanx. In hypertrophic osteoarthritic joints, it may be necessary to section the attachment of the central tendon to excise bony spurs. The collateral ligaments are left intact when possible. If they are incised for joint exposure, they should be reattached to bone with suture passed through a .05 drill hole made in the base of the middle phalanx.

2 Phalanges Preparation

The distal end of the proximal phalanx is resected at approximately the mid-portion of the head with a power saw (FIGURE 2). The articular surface of the middle phalanx is contoured to provide a surface against which the implant will be flush. This allows the buttress of the implant to fit against the bone while allowing the dorsal extension mechanism to remain intact.

Based on the resected phalangeal bone the implant size to be used should be estimated at this time using the color coded sizers. The optimum implant size will provide good coverage of the phalangeal bone without overhanging. Good coverage is important as it will help prevent volar impingement of the bone and provide greater range of motion.



FIGURE 1

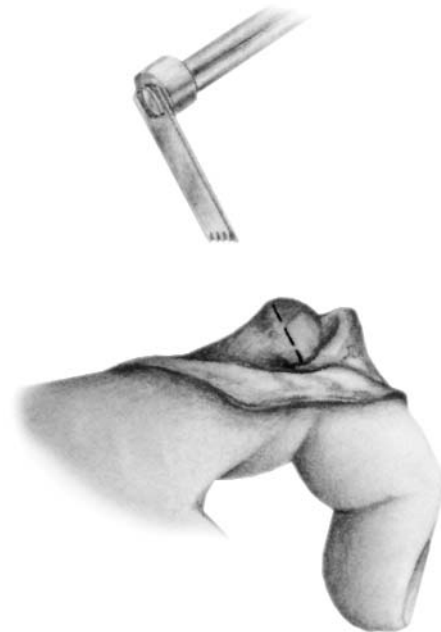


FIGURE 2

3 Broaching The Canals

The middle phalangeal canal preparation may be initiated using the starter awl provided with the instruments. Use the middle phalangeal broaches sequentially to the size previously noted. Broaches should be inserted to the end of the tapered section of the bit. Do not rotate the bit back and forth as this will distort the canal and allow movement of the implant. Be sure that the dorsal mark on the broach handle faces the dorsal surface.

As on the middle phalangeal side, start to open the proximal canal with the starter awl. Use the proximal phalangeal broaches sequentially to the appropriate size (**FIGURE 3**).

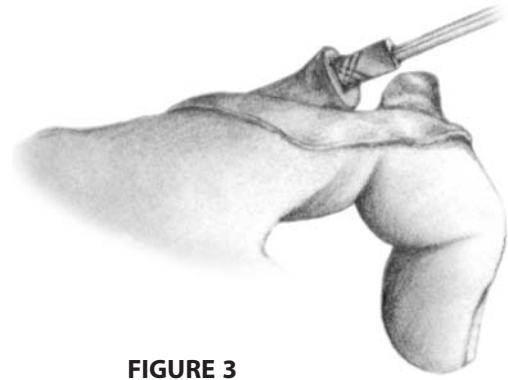


FIGURE 3

4 Trial Reduction And Implant Placement

Using the appropriate color coded sizer, do a trial reduction. Check tightness coverage and for volar impingement in full flexion. Unlike other implants of this type, the PIP does not need to be put in as tight as possible.

Prior to the insertion of the selected implant, the required sutures are placed in the drill holes made in the proximal phalanx for reconstruction of the collateral ligament system and in the base of the middle phalanx for reconstruction of the central tendon.

Smooth forceps are used to insert the implant. Care is taken not to nick or cut the prosthesis. The proximal phalanx stem is inserted first (**FIGURE 4**), followed by the middle phalanx stem. A final range of motion is performed to verify adequate joint mobility. The implant should be well seated but not compressed.

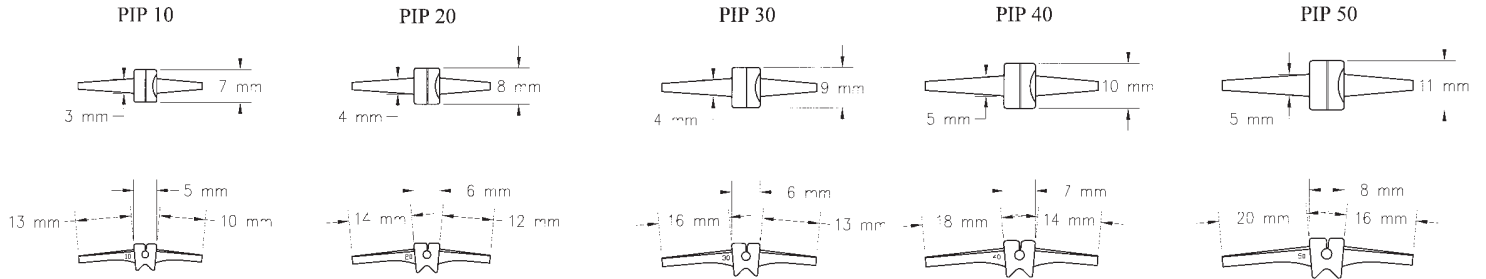
The ligament and tendon reconstruction and alignment are done, and the incision is closed in the usual manner.



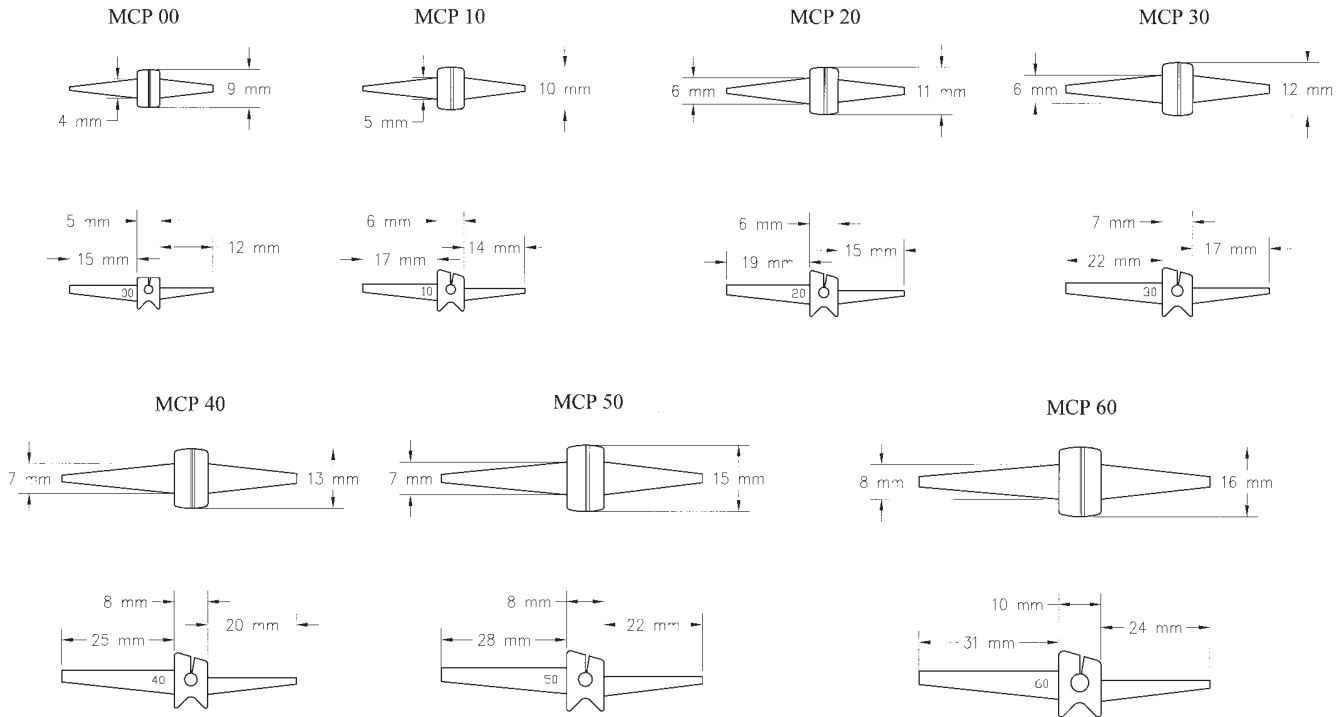
FIGURE 4

Specifications

SBi PIP™



SBi MCP™



SBi
SMALL BONE INNOVATIONS, INC.

MCP / PreFlex Silicone Surgical Technique

INDICATIONS

- > Degenerative or inflammatory joint disease of the metacarpophalangeal joints.
- > Dislocation or subluxation of the metacarpophalangeal joints.
- > Painful metacarpophalangeal joints with limitation of motion.
- > Ulnar drift not correctable by soft tissue procedure alone.

CONTRAINDICATIONS

- > Psychologically unsuitable patient.
- > Medically compromised patient.
- > Infection.
- > Inadequate bone stock.
- > Irreparable flexor and extensor apparatus.

PIP Silicone Surgical Technique

INDICATIONS

- > Degenerative or inflammatory joint disease of the approximal interphalangeal joints.
- > Dislocation or subluxation of the proximal interphalangeal joints.
- > Painful proximal interphalangeal joints with limitation of motion.

CONTRAINDICATIONS

- > Psychologically unsuitable patient.
- > Medically compromised patient.
- > Infection.
- > Inadequate bone stock.
- > Severe fixed boutonniere deformity where excessive bone resection would be required to return the digit to neutral.
- > Severe swan-neck deformity where volar stability could not be restored postoperatively.

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