Silicone PIP, MCP & MCP-X (PreFlex)

Finger Joint Arthroplasty

Operative Technique

- Silicone PIP
- Silicone MCP
- Silicone PreFlex (MCP-X)
Disclaimer

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. A workshop training is recommended prior to performing your first surgery. All non-sterile devices must be cleaned and sterilized before use.

Multicomponent instruments must be disassembled for cleaning. Please refer to the corresponding assembly/disassembly instructions.

Please remember that the compatibility of different product systems have not been tested unless specified otherwise in the product labeling V15106 and V15185 for a complete list of potential adverse effects, contraindications, warnings and precautions. The surgeon must discuss all relevant risks including the finite lifetime of the device with the patient when necessary.
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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.

The Silicone PIP, MCP, and MPC-X are prosthesis is fabricated from implantable grade silicone elastomer PIP and MCP joints. The device is used for replacement of the PIP and MCP joints for degenerative or post-traumatic disabilities presenting pain, crepitation and/or decreased motion.

**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 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.
Indications & Contraindications

Indications

Silicone MCP and MCP-X (Pre-Flex)
- Intended for replacement of the Metacarpophalangeal joint of the hand which has been damaged by rheumatoid, osteo, or post traumatic arthritis

Contraindications

Silicone MCP and MCP-X (Pre-Flex)
- A patient with skin, bone, circulatory and/or neurological deficiency;
- Nonfunctioning and irreparable musculoskeletal system;
- Active sepsis;
- Inadequate bone stock

Indications

Silicone PIP
Silicone elastomer implants are designed to assist in joint arthroplasty. Clinical indications for use of these devices include:
- Rheumatoid arthritis;
- Osteoarthritis;
- Ankylosed joints or those with limited range of motion which have not responded to conservative treatment;
- Non-functional joint due to inadequate bony alignment and joint space which cannot be restored by soft tissue reconstruction alone;
- Destroyed articular surface(s)

Contraindications

Silicone PIP
- A psychologically unsuitable patient;
- A patient with skin, bone, circulatory and/or neurological deficiency;
- Non-functioning joint and irreparable musculoskeletal system;
- Active sepsis;
- Inadequate bone stock

Warnings & Precautions

Please see package insert for Warnings, Precautions, Adverse Effects, and other essential product information.
MCP / PreFlex Silicone Operative Technique

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 (Fig. 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.

Metacarpal Resection and Implant Sizing

The metacarpal head is resected along with hypertrophied synovial material (Fig. 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 may help prevent volar impingement of the bone and allow for greater range of motion.
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 (Fig. 3).

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.

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 (Fig. 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.
Lateral Approach

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 potential 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 (Fig. 5A). 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 (Fig. 5B).

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

The proximal phalanx is cut transversely, just proximal to the head of the bone (Fig. 6). 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 may help prevent volar impingement of the bone and allow for greater range of motion.**

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.
**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 (Fig. 7).

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.
Dorsal Approach

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 (Fig. 8).

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” (1.2mm) drill hole made in the base of the middle phalanx.

Phalanges Preparation

The distal end of the proximal phalanx is resected at approximately the mid-portion of the head with a power saw (Fig. 9). 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 may help prevent volar impingement of the bone and allow for greater range of motion.
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 (Fig. 10).

**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 (Fig. 11), 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.

![Fig. 10](image1.png)

![Fig. 11](image2.png)
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