

# Knuckle Joint Replacement (MCPJ)

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## Overview

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- Metacarpophalangeal joint arthroplasty is performed safely in the setting of acute complex open MCP joint trauma [1].
- Revision MCP arthroplasty is a challenging procedure with one in five patients requiring a revision procedure at 5 years [2].
- Revision MCP arthroplasty has a relatively high rate of postoperative dislocations [2].
- Dorsal capsule interposition arthroplasty provides a viable surgical option for isolated degenerative or traumatic arthritis of the MCPJ at an average follow-up of 2 years [3].
- Silastic interposition arthroplasty of the MCPJ is reliable in terms of pain relief and correction of deformity [4].
- Patient satisfaction with silastic interposition arthroplasty of the MCPJ is high despite only modest improvements in the objective assessment of hand function [4].
- Treatment of MCP joint arthroplasty dislocation with revision to silicone implant appears to hold the most promise in achieving a stable MCP joint after an acute prosthetic dislocation [5].
- The unconstrained implant design for the MCP joint can have good outcomes and excellent arc of motion in OA patients [7].
- MCP joint arthroplasty is an effective treatment option from a patient-centered perspective, improving appearance, pain, and function [8].
- Periprosthetic joint infection (PJI) is uncommon after MCP or PIP arthroplasties [9].
- Patient expectations of MCP joint arthroplasty were uniformly high, with functional improvement being the greatest motivation for surgery [10].
- Joint goal-setting is essential for understanding patients' unique reasons for undergoing MCP arthroplasty and facilitating realistic expectations [11].
- Implant arthroplasty of the PIP, MCP, and TMC joints predictably produces pain relief and high satisfaction [20].
- Implant arthroplasty of the PIP, MCP, and TMC joints has historically suffered from high rates of complications [20].

- The evidence regarding MCP arthroplasty for OA consists of retrospective cohorts with small sample sizes and relatively short evaluations [22].

## Anatomy & Pathophysiology

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- MCP joint arthroplasty was performed safely in the setting of acute complex open MCP joint trauma [1].
- Increasing MCP joint flexion range was associated with increased fractures of silicone implants [6].
- Nonconstrained implant designs for the MCP joint can provide good outcomes and excellent arc of motion in osteoarthritis patients [7].
- Patients with greater hand function preoperatively may be at higher risk of revision surgery after silicone MCP arthroplasty [12].
- Both NeuFlex and Swanson implant groups obtained satisfactory clinical improvement after MCP reconstruction in rheumatoid arthritis patients [14].
- Swanson arthroplasty frequently results in a range of flexion of the MP joint of the little finger that may be insufficient for its principal functions [17].
- A surgical strategy for severely collapsed zigzag thumb deformities involves gradual correction with external fixators following arthroplasty [18].
- Not all MCP hyperextension deformities associated with trapeziometacarpal osteoarthritis require surgical interventions [19].
- Secondary outcomes including key pinch strength, pain, the brief Michigan Hand Outcomes Questionnaire, and complications did not differ between groups at 2 years following correction of MCP hyperextension after trapeziometacarpal joint implant arthroplasty [21].
- Thumb MCP joint capsulodesis performed concurrently with trapeziometacarpal arthroplasty can be a straightforward procedure that produces positive results [23].
- Implant fractures following silicone MCP arthroplasty did not significantly affect upper limb function [27].
- The hypothesis that ulnar fingers would have worse outcomes than radial fingers after silicone arthroplasty was not proven; sufficient correction of deformities in ulnar fingers is possible with adequate bone resection and realignment of the extensor mechanism [28].
- Volar and proximal translation of the proximal phalanx was observed on 4-dimensional computed tomography after silicone implant arthroplasty in rheumatoid arthritis patients [29].
- Implant-free anatomical reconstruction of thumb MCP joint chronic ulnar collateral ligament injuries achieved stable intra-osseous fixation and restored grip, pinch strength, and range of motion while avoiding drawbacks associated with implants [30].
- Objective results after revision MCP surgery in rheumatoid patients following previous silicone arthroplasty were generally poor, with minimal improvement in ulnar drift, a high rate of implant fracture, and no change in arc of motion [33].

- Maintaining finger position without recurrence of ulnar drift or extensor lag, and maintaining MCP arc of motion, corresponded with patient satisfaction after silicone MCP arthroplasty for rheumatoid arthritis [35].
- Improvement in clinical assessments was comparable between bioconstructive Poly-L/D-Lactide implants and Swanson prostheses, except for better maintenance of palmar alignment in the Swanson group [36].

## Classification

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- MCP joint arthroplasty can be performed safely in the setting of acute complex open MCP joint trauma [1].
- Revision MCP arthroplasty is a challenging procedure with a 20% (one in five) rate of requiring a revision procedure at 5 years and a relatively high rate of postoperative dislocations [2].
- Dorsal capsule interposition arthroplasty is a viable surgical option for isolated degenerative or traumatic arthritis of the MCPJ [3].
- Silastic interposition arthroplasty of the MCPJ is reliable for pain relief and correction of deformity, with high patient satisfaction despite modest improvements in objective hand function assessment [4].
- Revision to a silicone implant is the treatment with the most promise for achieving a stable MCP joint after an acute prosthetic dislocation [5].
- Increasing MCP joint flexion range is associated with increased fractures of silicone implants in patients with rheumatoid arthritis [6].
- MCP joint arthroplasty is an effective treatment option for rheumatoid arthritis, improving appearance, pain, and function from a patient-centered perspective [8].
- Patients with greater hand function preoperatively may be at higher risk of revision surgery after silicone MCP arthroplasty for inflammatory arthritis [12].
- Both NeuFlex and Swanson implants provide satisfactory clinical improvement after MCP reconstruction in rheumatoid arthritis patients [14].
- MCP joint arthroplasty continues to play a central role in the management of the rheumatoid hand [16].
- Swanson silicone arthroplasty frequently results in insufficient flexion range of the little finger MP joint for its principal functions [17].
- Not all MCP hyperextension deformities associated with trapeziometacarpal osteoarthritis require surgical intervention [19].

## Clinical Presentation

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- Metacarpophalangeal joint arthroplasty is indicated for isolated degenerative or traumatic arthritis of the MCPJ [3].
- Metacarpophalangeal joint arthroplasty is indicated for osteoarthritis of the MCP joint [7].
- Metacarpophalangeal joint arthroplasty is indicated for noninflammatory arthritis of the MCP joints [13].

- Metacarpophalangeal joint arthroplasty is indicated for nonrheumatic metacarpophalangeal joint arthritis [24].
- Metacarpophalangeal joint arthroplasty plays a central role in the management of the rheumatoid hand [16].
- Metacarpophalangeal joint arthroplasty is an effective treatment option for rheumatoid arthritis, improving appearance, pain, and function [8].
- Patient expectations of MCP joint arthroplasty are uniformly high [10].
- Functional improvement is the greatest motivation for MCP joint arthroplasty surgery [10].
- Hand appearance is a patient motivation for surgery and a determinant of satisfaction with MCP joint arthroplasty for rheumatoid arthritis [10].
- Implant arthroplasty of the MCP joints predictably produces pain relief and high satisfaction [20].
- Silastic interposition arthroplasty of the MCPJ results in high patient satisfaction despite only modest improvements in the objective assessment of hand function [4].
- Silicone arthroplasty for nonrheumatic arthritis results in excellent pain relief and excellent patient satisfaction [24].
- Pain ratings significantly improve following surface replacement arthroplasty in MCP joints affected by noninflammatory arthritis [13].
- The arc of motion significantly improves following surface replacement arthroplasty in MCP joints affected by noninflammatory arthritis [13].
- Silicone arthroplasty for nonrheumatic arthritis results in improved range of motion and DASH score [24].
- Swanson silicone arthroplasty frequently results in a range of flexion of the MP joint of the little finger that may be insufficient for its principal functions [17].
- Increasing MCP joint flexion range is associated with increased fractures of silicone implants [6].
- One in five patients requires a revision procedure at 5 years following revision MCP arthroplasty [2].
- Squeaking in pyrolytic carbon MCP joint replacement can be associated with pain and swelling [34].

## Investigations

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- Patient satisfaction is high following silastic interposition arthroplasty of the MCPJ despite only modest improvements in the objective assessment of hand function [4].
- Increasing MCP joint flexion range was associated with increased fractures of silicone implants in patients with rheumatoid arthritis [6].
- The unconstrained implant design for the MCP joint can have good outcomes and excellent arc of motion in osteoarthritis patients [7].
- MCP joint arthroplasty is an effective treatment option from a patient-centered perspective, improving appearance, pain, and function in rheumatoid arthritis [8].

- Patients with greater hand function preoperatively may be at higher risk of revision surgery after silicone metacarpophalangeal joint arthroplasty in inflammatory arthritis [12].
- Pain ratings and MCP arc of motion significantly improved following surface replacement arthroplasty in metacarpophalangeal joints affected by noninflammatory arthritis [13].
- Both NeuFlex and Swanson metacarpophalangeal implants obtained satisfactory clinical improvement after MCP reconstruction of the hand in rheumatoid arthritis [14].
- The articulated spacer technique can be considered an option to maintain motion while treating infected MCPJ arthroplasties, avoiding co-morbidity resulting from immobilisation [15].
- Metacarpophalangeal joint arthroplasty continues to play a central role in the management of the rheumatoid hand [16].
- The study proposes a surgical strategy for severely collapsed zigzag thumb deformities using gradual correction with external fixators [18].
- Not all MCP hyperextension deformities will require surgical interventions according to known algorithms [19].
- Secondary outcomes including key pinch strength, pain, the brief Michigan Hand Outcomes Questionnaire and complications did not differ between groups at 2 years in the correction of MCP hyperextension following trapeziometacarpal joint implant arthroplasty [21].
- The evidence regarding MCP arthroplasty for osteoarthritis consists of retrospective cohorts with small sample sizes and relatively short evaluations [22].

## Treatment

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- Metacarpophalangeal joint arthroplasty can be performed safely in the setting of acute complex open MCP joint trauma [1].
- Secondary outcomes including key pinch strength, pain, the brief Michigan Hand Outcomes Questionnaire and complications did not differ between groups at 2 years following correction of metacarpophalangeal joint hyperextension following trapeziometacarpal joint implant arthroplasty [21].
- Silicone arthroplasty for nonrheumatic metacarpophalangeal joint arthritis showed improved range of motion and DASH score, excellent pain relief, and excellent patient satisfaction [24].
- Intraoperative fractures occurred in 3% of MCP joint arthroplasties and were associated with pyrocarbon implants, cementless fixation, and diabetes mellitus [25].
- Good pain relief, a functional range of motion, and high satisfaction were seen in the majority of patients following pyrocarbon metacarpophalangeal joint arthroplasty in noninflammatory arthritis at minimum 5-year follow-up [26].
- The indications for and long-term expectations of silicone metacarpophalangeal arthroplasty must be carefully examined in light of the improvements in the medical management of rheumatoid disease [31].
- A long stem ulnar prosthesis, with or without radial osteotomy, is advocated as a salvage procedure for failed Sauve-Kapandji procedures resulting in fracture of the proximal phalanx pyrocarbon implant [32].

## Complications

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- The treatment of acute MCP joint arthroplasty dislocation with revision to silicone implant appears to hold the most promise in achieving a stable MCP joint after an acute prosthetic dislocation [5].
- PJI is uncommon after MCP or PIP arthroplasties [9].
- Patients with greater hand function preoperatively may be at higher risk of revision surgery after silicone MCP arthroplasty in patients with inflammatory arthritis [12].
- Implant arthroplasty of the MCP joints has historically suffered from high rates of complications [20].
- Complication and overall reoperation rates were high for pyrocarbon arthroplasty in MCP joints affected by rheumatoid arthritis [37].
- One in 10 patients with pyrocarbon arthroplasty for rheumatoid arthritis undergo revision within 5 years postoperatively [37].
- Metacarpophalangeal arthroplasty using a pyrocarbon implant for osteoarthritis demonstrates a 7% revision rate at 5 years after surgery [38].

## Recovery

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- Revision MCP arthroplasty is a challenging procedure [2].
- One in five patients require a revision procedure at 5 years [2].
- There is a relatively high rate of postoperative dislocations following revision MCP arthroplasty [2].
- Silastic interposition arthroplasty of the MCPJ is reliable in terms of pain relief [4].
- Silastic interposition arthroplasty of the MCPJ is reliable in terms of correction of deformity [4].
- Patient satisfaction is high following silastic interposition arthroplasty of the MCPJ [4].
- There are only modest improvements in the objective assessment of hand function following silastic interposition arthroplasty of the MCPJ [4].
- MCP joint arthroplasty is an effective treatment option from a patient-centered perspective for rheumatoid arthritis [8].
- MCP joint arthroplasty improves appearance for patients with rheumatoid arthritis [8].
- MCP joint arthroplasty improves pain for patients with rheumatoid arthritis [8].
- MCP joint arthroplasty improves function for patients with rheumatoid arthritis [8].
- Patient expectations of MCP joint arthroplasty were uniformly high [10].
- Functional improvement was the greatest motivation for surgery in patients undergoing MCP joint arthroplasty [10].
- Joint goal-setting is essential for understanding patients' unique reasons for undergoing MCP arthroplasty [11].
- Joint goal-setting facilitates realistic expectations for patients undergoing MCP arthroplasty [11].

- Pain ratings significantly improved following surface replacement arthroplasty in metacarpophalangeal joints affected by noninflammatory arthritis [13].
- MCP arc of motion significantly improved following surface replacement arthroplasty in metacarpophalangeal joints affected by noninflammatory arthritis [13].
- HAPY spherical pyrocarbon interposition arthroplasty for the metacarpophalangeal joint demonstrates satisfactory short- to mid-term outcomes [40].
- HAPY spherical pyrocarbon interposition arthroplasty for the metacarpophalangeal joint results in considerable improvements in pain relief [40].
- HAPY spherical pyrocarbon interposition arthroplasty for the metacarpophalangeal joint results in considerable improvements in joint mobility [40].

## Key Evidence

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- [L4] MCP joint arthroplasty was performed safely in the setting of acute complex open MCP joint trauma. [1] ([10.1016/j.jhsa.2015.09.012](https://doi.org/10.1016/j.jhsa.2015.09.012))
- [L4] Revision MCP arthroplasty is a challenging procedure with one in five patients requiring a revision procedure at 5 years and a relatively high rate of postoperative dislocations. [2] ([10.5435/jaaos-d-17-00042](https://doi.org/10.5435/jaaos-d-17-00042))
- [L4] This technique of dorsal capsule interposition arthroplasty provides a viable surgical option for isolated degenerative or traumatic arthritis of the MCPJ at an average follow-up of 2 years. [3] ([10.1177/1558944720911215](https://doi.org/10.1177/1558944720911215))
- [L4] Silastic interposition arthroplasty of the MCPJ is reliable in terms of pain relief and correction of deformity, and patient satisfaction is high despite only modest improvements in the objective assessment of hand function. [4] ([10.1054/jhsb.2000.0402](https://doi.org/10.1054/jhsb.2000.0402))
- [L4] The treatment of MCP joint arthroplasty dislocation with revision to silicone implant appears to hold the most promise in achieving a stable MCP joint after an acute prosthetic dislocation. [5] ([10.1016/j.jhsa.2017.10.001](https://doi.org/10.1016/j.jhsa.2017.10.001))
- [L4] Increasing MCP joint flexion range was associated with increased fractures of the implants. [6] ([10.1016/j.jhsa.2020.09.002](https://doi.org/10.1016/j.jhsa.2020.09.002))
- [L5] The nonconstrained implant design for the MCP joint can have good outcomes and excellent arc of motion in OA patients. [7] ([10.1016/j.jhsa.2012.11.025](https://doi.org/10.1016/j.jhsa.2012.11.025))
- [L4] MCP joint arthroplasty is an effective treatment option from a patient-centered perspective, improving appearance, pain, and function. [8] ([10.1016/j.hcl.2006.02.001](https://doi.org/10.1016/j.hcl.2006.02.001))
- [L4] PJI is uncommon after MCP or PIP arthroplasties. [9] ([10.1016/j.jhsa.2024.12.008](https://doi.org/10.1016/j.jhsa.2024.12.008))
- [L1] Patient expectations of MCP joint arthroplasty were uniformly high, with functional improvement being the greatest motivation for surgery. [10] ([10.1016/j.jhsa.2011.02.002](https://doi.org/10.1016/j.jhsa.2011.02.002))
- [L4] Joint goal-setting is essential for understanding patients' unique reasons for undergoing MCP arthroplasty and facilitating realistic expectations. [11] ([10.1002/msc.1061](https://doi.org/10.1002/msc.1061))

- [L3] Patients with greater hand function preoperatively may be at higher risk of revision surgery. [12] ([10.1177/1558944719831236](#))
- [L4] Pain ratings and MCP arc of motion significantly improved following arthroplasty. [13] ([10.1177/15589447211028917](#))
- [L1] Both implant groups obtained satisfactory clinical improvement after MCP reconstruction of the hand. [14] ([10.1016/j.jhsa.2009.09.020](#))
- [L5] The articulated spacer technique can be considered an option to maintain motion while treating infected MCPJ arthroplasties, avoiding co-morbidity resulting from immobilisation. [15] ([10.1177/17531934251323067](#))
- [L5] Metacarpophalangeal joint arthroplasty continues to play a central role in the management of the rheumatoid hand. [16] ([10.1177/17531934261430139](#))
- [L4] Our experience with this cohort, a review of published literature, and a survey of international experts suggest that Swanson arthroplasty frequently results in a range of flexion of the MP joint of the little finger that may be insufficient for its principal functions. [17] ([10.1007/s11552-007-9051-5](#))
- [Paper] The study proposes a surgical strategy for severely collapsed zigzag thumb deformities using gradual correction with external fixators. [18] ([10.1007/s12593-015-0178-2](#))
- [L4] Not all MCP hyperextension deformities will require surgical interventions according to known algorithms. [19] ([10.1007/s00402-021-03838-8](#))
- [L4] Implant arthroplasty of the PIP, MCP, and TMC joints predictably produces pain relief and high satisfaction but has historically suffered from high rates of complications. [20] ([10.1016/j.jhsa.2017.07.030](#))
- [L3] Secondary outcomes including key pinch strength, pain, the brief Michigan Hand Outcomes Questionnaire and complications did not differ between groups at 2 years. [21] ([10.1177/17531934251330975](#))
- [L4] The evidence regarding MCP arthroplasty for OA consists of retrospective cohorts with small sample sizes and relatively short evaluations. [22] ([10.1016/j.jhsa.2015.05.019](#))
- [L4] Thumb MCP joint capsulodesis performed concurrently with trapeziometacarpal arthroplasty can be a straightforward procedure that produces positive results. [23] ([10.1016/j.jhsa.2014.07.045](#))
- [L3] This study showed improved range of motion and DASH score, excellent pain relief, and excellent patient satisfaction in patients undergoing MCP arthroplasty for nonrheumatic arthritis. [24] ([10.1016/j.jhsa.2013.09.016](#))
- [L3] Intraoperative fractures occurred in 3% of MCP joint arthroplasties and were associated with pyrocarbon implants, cementless fixation, and diabetes mellitus. [25] ([10.1016/j.jhsa.2014.12.038](#))
- [L4] Good pain relief, a functional range of motion, and high satisfaction were seen in the majority of patients. [26] ([10.1016/j.jhsa.2015.06.104](#))
- [L4] However, implant fractures did not significantly affect upper limb function. [27] ([10.1016/j.jhsa.2024.01.009](#))

- [L2] The hypothesis that ulnar fingers would have worse outcomes than radial fingers was not proven; sufficient correction of deformities in ulnar fingers is possible if adequate bone resection and realigning of the extensor mechanism are carefully performed. [28] ([10.1016/j.jhsa.2009.06.029](https://doi.org/10.1016/j.jhsa.2009.06.029))
- [L4] Volar and proximal translation of the proximal phalanx was observed on 4-dimensional computed tomography. [29] ([10.1016/j.jhsa.2021.10.001](https://doi.org/10.1016/j.jhsa.2021.10.001))
- [L4] The surgical procedure achieved stable intra-osseous fixation and restored grip, pinch strength, and range of motion while avoiding drawbacks associated with implants. [30] ([10.1177/17531934231182895](https://doi.org/10.1177/17531934231182895))
- [L4] Given these findings, the indications for and long-term expectations of silicone metacarpophalangeal arthroplasty must be carefully examined in light of the improvements in the medical management of rheumatoid disease. [31] ([10.2106/00004623-200310000-00001](https://doi.org/10.2106/00004623-200310000-00001))
- [L4] The authors advocate the use of a long stem ulnar prosthesis, with or without radial osteotomy, as a salvage procedure for failed Sauve-Kapandji procedures. [32] ([10.1177/1753193410384891](https://doi.org/10.1177/1753193410384891))
- [L4] Objective results, however, were generally poor, with minimal improvement in ulnar drift, a high rate of implant fracture, and no change in arc of motion. [33] ([10.1016/j.jhsa.2007.07.026](https://doi.org/10.1016/j.jhsa.2007.07.026))
- [L5] If squeaking is associated with pain and swelling, revision MCP joint arthroplasty is recommended to identify and correct the underlying cause, such as implant subsidence or an incongruous joint. [34] ([10.1016/j.jhsg.2022.10.002](https://doi.org/10.1016/j.jhsg.2022.10.002))
- [L2] However, maintaining finger position, without recurrence of ulnar drift or extensor lag, and MCP arc of motion corresponded with patient satisfaction in the postoperative period. [35] ([10.1016/j.jhsa.2011.09.042](https://doi.org/10.1016/j.jhsa.2011.09.042))
- [L1] Improvement in clinical assessments was comparable in both groups, except for better maintenance of palmar alignment in the Swanson group. [36] ([10.1177/1753193410375777](https://doi.org/10.1177/1753193410375777))
- [L4] Complication and overall reoperation rates were high, while 1 in 10 undergo revision within 5 years postoperatively. [37] ([10.1177/15589447211063577](https://doi.org/10.1177/15589447211063577))
- [L4] Metacarpophalangeal arthroplasty using a pyrocarbon implant for osteoarthritis demonstrates a 7% revision rate at 5 years after surgery. [38] ([10.1016/j.jhsa.2022.08.013](https://doi.org/10.1016/j.jhsa.2022.08.013))
- [L4] The HAPY spherical pyrocarbon interposition arthroplasty for the metacarpophalangeal joint demonstrates satisfactory short- to mid-term outcomes, with considerable improvements in pain relief and joint mobility. [40] ([10.1016/j.jhsg.2025.100804](https://doi.org/10.1016/j.jhsg.2025.100804))

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