

TRAPEZIOMETACARPAL PROSTHESIS AND THUMB METACARPOPHALANGEAL JOINT FUSION : IS IT COMPATIBLE ?

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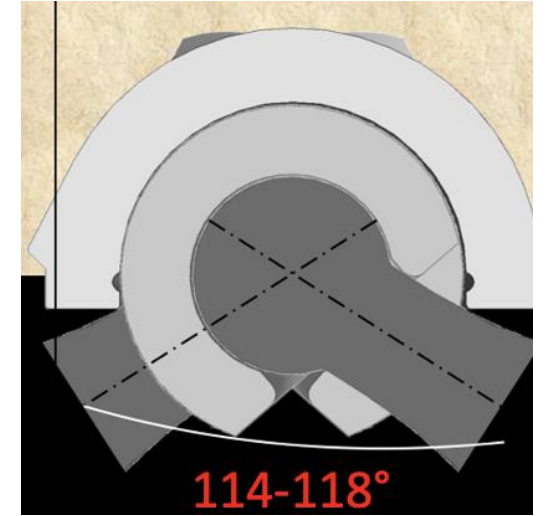
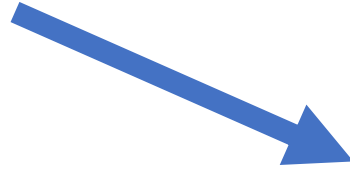
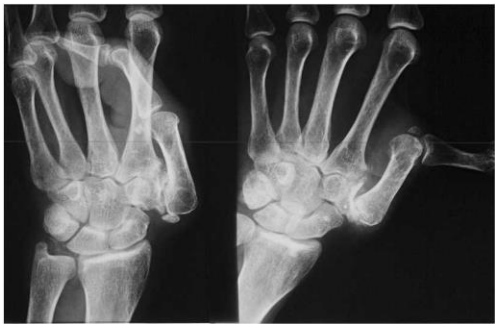
HYPOTHESIS

In case of symptomatic metacarpophalangeal (MCP) joint (painful, unstable joint, osteo-arthritis) following trapeziometacarpal (TM) prosthesis, the MCP joint fusion may have mechanical constraints on the prosthesis and the method of fixation for MCP joint fusion may be limited by the small available space due to stem prosthesis.

THE FACTS

The thumb Metacarpophalangeal (MCP) range of motion is variable across individual, in flexion, in particular. In 10% of the population the joint is flattened, and mobility significantly reduced without impairment on the thumb function thanks to mobility in the CMC and Interphalangeal (IP) joint.

Trapeziometacarpal (TM) prosthesis by restoring the length of the thumb, may correct the MCP hyperextension or prevent its aggravation, if it was present pre-operatively.



Dual mobility TM prosthesis allows an arch of mobility of the Trapeziometacarpal joint between 114 and 118°.



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METHODS

We report three cases of definitive MCP fusion in the context of TM prosthesis and their impact on the thumb's function, at minimum five-year follow-up (post prosthesis)

Surgical indication: painful MCP OA.

A segmental MCP brace mimicking the definite fusion was tested for 6 weeks before the surgery.

The MCP bone fusion was adjusted, according to have a full contact between the thumb and the index pulps (functional positioning): after cartilage removal, the first phalanx was derotated, MCP in 30 degrees flexion with compression between the two bones.

Fixation was performed twice with a dorsal locking plate, and one with bone staple and k-wire fixation. The thumb was placed in a thumb plaster (Alpine splint-type) for three months, keeping IP and TM joints free for post operative mobilization.

At three months, all MCP joint had been fused.



Alpine splint-type



MCP Bone fusion: functional positioning

CASE 1

54 year-old female, right-handed, office work.
Double mobility implant prosthesis (spherical cup, Touch®, Kerimedical) for **left TM** osteoarthritis (OA) Dell 2 with an initially asymptomatic MCP joint.

Initial pain free MCP range of motion: 0/60°.

MCP bone fusion performed 12 months after TM prosthesis
(painful MCP joint: - 40/0/60°, Key pinch: 1.5 kg, Tip Pinch: 1kg)



At the last follow-up, 5 years after MCP fusion and 6 years after TM prosthesis, thumb function:

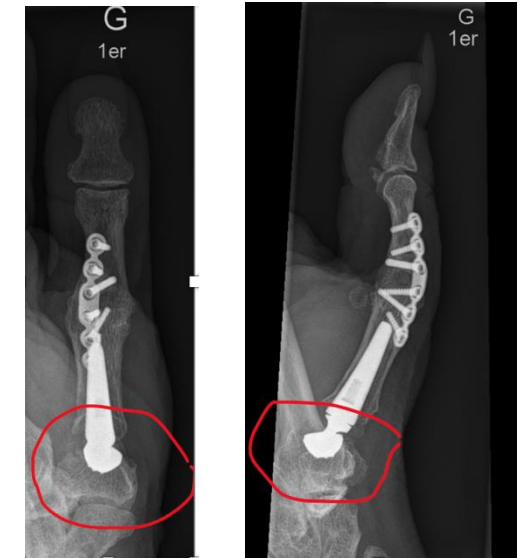
Thumb shortening, VAS: 0, PRWE: 36/150, Kapandji: 9, thumb extension scale: ¼, Ke pinch: 3 kg, Tip pinch: 1.5 kg.
High satisfaction of patient with pain relief and better prehensile strength.



CMC OA Dell 2 stage



TM Prosthesis at 12 months
painful MCP joint: - 40/0/60°

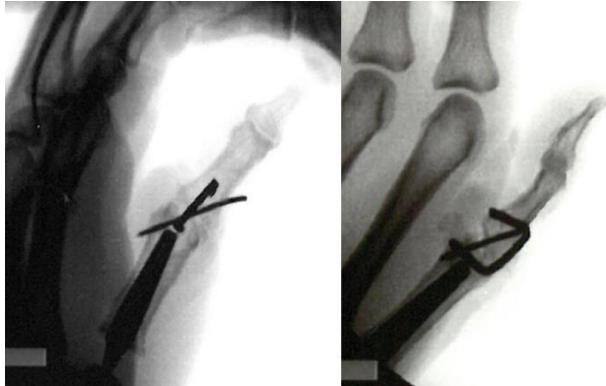


60 months after MCP fusion and 72 months after TM prosthesis

CASE 2

55 year-old female, farmer
Left dominant basal thumb Osteoarthritis (OA), Dell stage 2.
Double mobility implant prosthesis (Tronconic cup Moovis® - Striker).

MCP joint bone fusion performed **27 months** after prosthesis placement (unstable painful ulnar MCP joint)
Memory staple removed at 3 months, bone fusion)



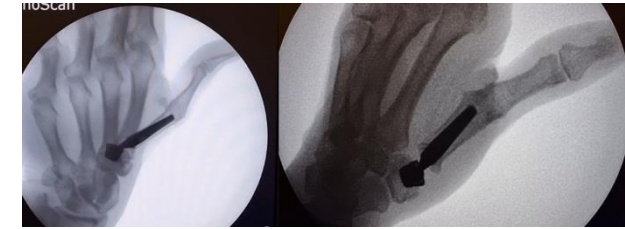
Postoperative X-rays

At the last follow-up, 48 months after MCP fusion and 75 months after TM prosthesis, thumb function:

Thumb shortening, VAS 0, PRWE: 20/150, Kapandji score 10,
extension: 2/4, Key pinch: 5 kg, Tip pinch: 4 kg.
High satisfaction of patient with pain relief and restored strength.



*TM Prosthesis at 27 months
ulnar unstable painful MCP joint*



After hardware removal



48 months after MCP fusion and 75 months after TM prosthesis

CASE 2 : at the last follow up. Vidéos.



Thumb opposition



Thumb extension

CASE 3

79 year-old right-handed female

Symptomatic right scaphoid chondrocalcinosis advanced collapse (SCAC wrist): first row carpectomy combined with suspended double mobility implant TM prosthesis (spherical cup, Touch®, Kerimedical)

Secondary MCP joint bone fusion performed 17 months after prosthesis placement (locking plate).

Non-union and hardware fracture diagnosed four months after bone fusion procedure.

At the last follow-up, 31 months after MCP bone fusion and 48 months after TM prosthesis, thumb function:

MCP joint healed with an asymptomatic valgus deformity.

VAS 0->3, Kapandji 7, extension: ¼, Key pinch: 3 kg, tip pinch: 2 kg (strength was restored).



non-union and locking plate fracture diagnosed 4 months after bone fusion



31 months after MCP fusion and 48 months after TM prosthesis

SUMMARY

MCP joint fusion in the context of TM prosthetic arthroplasty is a solution when two joints in a row present symptomatic osteoarthritic damages.

MCP joint fusion fixation is not limited by the small available space.

This double procedure seemed to have durability without any basal implant complication (loosening, polyethylene wear, dislocation, overloading) with pain-free TM joint.

LIMITATIONS: Mechanical constraints on prosthesis need to be confirmed by longer series and sufficient follow-up

Disclosure

Gregoire Chick received financial compensation from kerimedical for his teaching activities
Nathalie de Lambilly and Grégoire Chick did not participate in the development of nor receive royalties for any of the presented implant



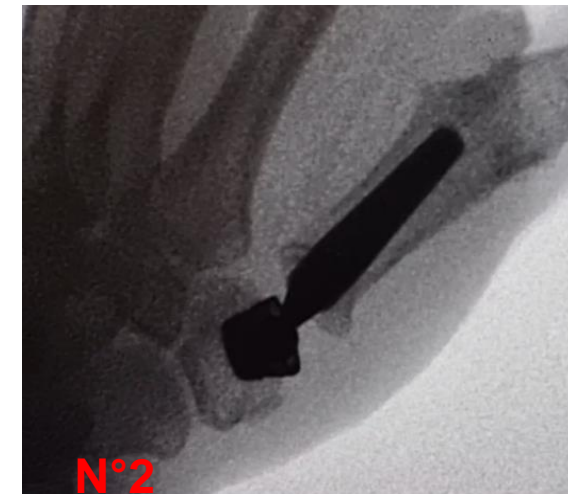
N°1

Follow-up: 60 months



N°3

Follow-up: 31 months



N°2

Follow-up: 48 months