

TMC Prosthesis complications

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Review article

2015

Thumb carpometacarpal joint total arthroplasty: a systematic review

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European Volume
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SAGE

Implant	Authors	Pain	Radiographic outcome	Mean grip strength (kg)	Mean 1st pinch strength (kg)	Mean 2nd pinch strength (kg)	Failure rate	Predominant complication
Arpe	Britton and Kinner, 2004	0.1 on a scale 0-4	6/13 dislocations; 3/13 cup loosening; 1/13 metacarpal loosening	n/a	6.1 (98.5% of the opposite side)	n/a	5% (3/63)	Dislocations
	Jacoulet, 2005	All pain free	2/37 dislocations; 1/37 gross cup loosening	23	4	n/a	8% (3/37)	Dislocations
	Apard and Saint-Cast, 2007	Pain with prolonged use in 5; Pain in the cold in 7	1/22 dislocations; 1/22 partial dislocation; 5/22 loosening	20	5.7	n/a	22% (17/32)	Loosening
	Vander Eecken et al., 2012	1 (VASI) post-op	1/43 cup perforation; 1/43 loosening; 1/43 polyethylene wear; 2/43 dislocation or subsidence; 1/43 minor loosening; 8% failed	n/a	n/a	n/a	9% (4/43)	Dislocation
	Martin-Ferrero, 2013	7 (A) 1 (VASI) (pre-op/post-op) P<0.001	No evidence of implant loosening; cup migration; stem subsidence; or subluxation	n/a	4.3/5.4 (pre-op/post-op) P=0.005	n/a	5% (3/63)	Loosening
Braun-Cutter	Badia and Samselam, 2006	Complete pain relief was achieved in 24 patients (94%)	No evidence of implant loosening; cup migration; stem subsidence; or subluxation	n/a	3.0/5.5 (pre-op/post-op)	n/a	4% (1/24)	Loosening
	Reid et al., 2009	1 (29 VAS)	11/62 trapezoid loosening; 1/62 metacarpal loosening	19.6	n/a	4	11% (13/62)	Loosening
Cemented resurfacement arthroplasty	Guo et al., 2009	78% (50/64) pain free (Muller and Muller's classification)	6/64 radiolucent lines; 1/64 metacarpal sinking	19	6	n/a	2% (1/64)	Loosening
	Masjejan et al., 2009	3 (S) 7 (M) and Muller's classification) p<0.0001	33% cases with lucid lines; 3% cases with trapezoid cup loosening; 3% cases with metacarpal stem loosening	79% of opposite side 28.8/22.4 (operated/non-operated)	44.2	n/a	1% (1/64)	Pain
Iris	Seeg and Charnick, 2013	8 (7/3) (VASI) (pre-op/post-op)	Radiolucent lines 29%; loosening 19%	17	5	3	3% (1/30)	Loosening
	Goubau et al., 2013	8 (7/1) (VASI) (pre-op/post-op) p<0.0001	1/22 radiological instability of the cup; 21/22 good results with no osteolysis	17.2/22.2 (pre-op/post-op) p<0.001	4.5/5.1 (pre-op/post-op) p<0.15	n/a	5% (1/22)	SBR dysaesthesia
Maia	Kubitz and Trilk, 2012	8 (4/4) (VASI) (pre-op/post-op)	1/36 loosening; 1/36 traumatic implant dislocation	15.8/26.8 (pre-op/post-op)	2.7/5.7 (pre-op/post-op)	2.3/4.9 (pre-op/post-op)	3% (1/36)	Loosening

2016

Hand Surg Rehabil. 2016 Jun;35(3):190-198. doi: 10.1016/j.hansur.2016.02.005. Epub 2016 May 31.

Complications and failures of the trapeziometacarpal Maia® prosthesis: A series of 156 cases.

Bricout M¹, Rezzouk J².

156 MAIA 2008-2012

- 16,0% Tendinitis de Quervain
- 4,5% Dislocation
- 2,6% Loosening
- 11,5% Surgical revision
- 7,7% Failure Trapeziectomy
- 90,8% Survival rate at 5y

The Journal of Hand Surgery

ASSH

MAIA Trapeziometacarpal Joint Arthroplasty: Clinical and Radiological Outcomes of 80 Patients With More than 6 Years of Follow-Up

Adriano Toffoli, MD¹, Jacques Teissier, MD

Published Online: July 13, 2017

DOI: <https://doi.org/10.1016/j.jhsa.2017.06.008>

2006 - 2009:

- 96 Maia at 6 y (Publication 2017)
- 6% Dislocation
- 4,6% Loosening
- 3,1% Post-traumatic fractures
- 8,3% Revision of the Tmc prosthesis
- 5,2% Failure Trapeziectomy
- 93% Survival rate at 6 y

Full Length Article

JHS(E)

Can surgical guidelines minimize complications after Maia® trapeziometacarpal joint arthroplasty with unconstrained cups?

Pieter Caekebeke and Joris Duerinckx

- 50 Maia mai 2011-mai 2012
- 0% dislocation
- 5% post traumatic loosening
- 0% spontaneous loosening
- 2% wear of PE
- 4% revision
- 4% Trapeziectomy failure
- 96% survival rate at 56 m

2017

EDITORS' CHOICE

Joint Survival Analysis and Clinical Outcome of Total Joint Arthroplasties With the ARPE Implant in the Treatment of Trapeziometacarpal Osteoarthritis With a Minimal Follow-Up of 5 Years

Karim Coergans, MD¹, Jeroen Vanhaecke, MD², Markien Deuille, MD³, Joeri Barth, MD⁴, Hans Pottel, MD⁵, Filip Stockmans, MD, PhD¹



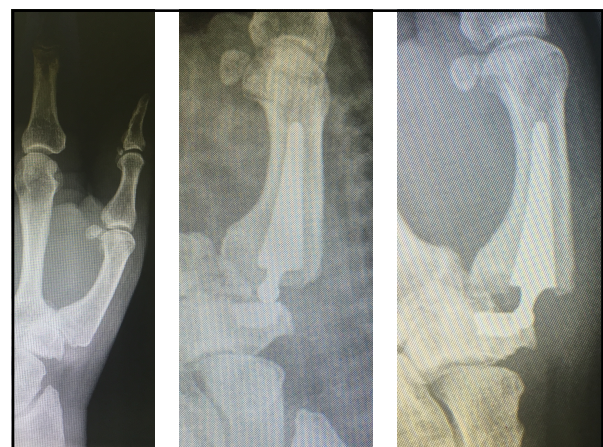
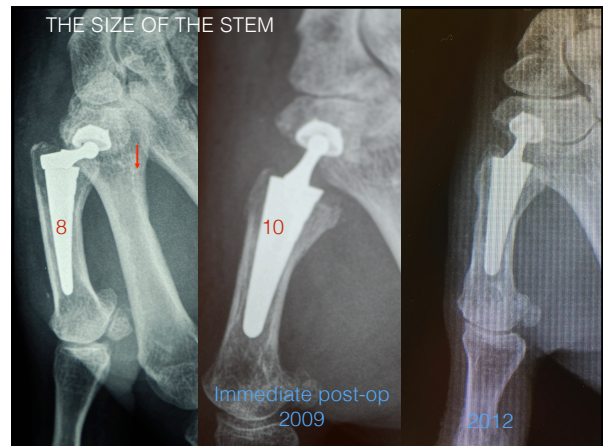
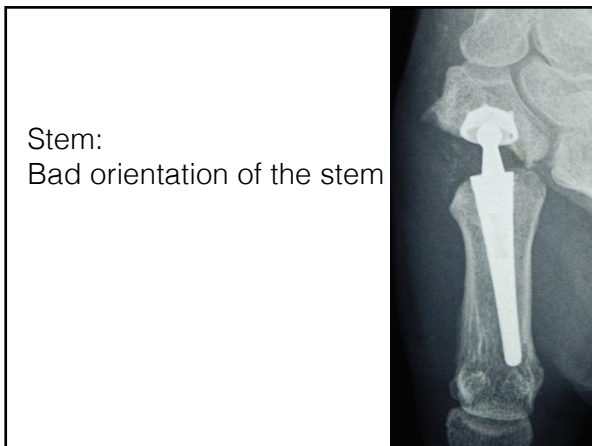
- 166 Implants 2003 - 2010
- 4,8 % Dislocation
- 1,0% Loosening - 1,0% subsidence
- 3,0% Failure trapeziectomy
- 96% Survival rate min 5y

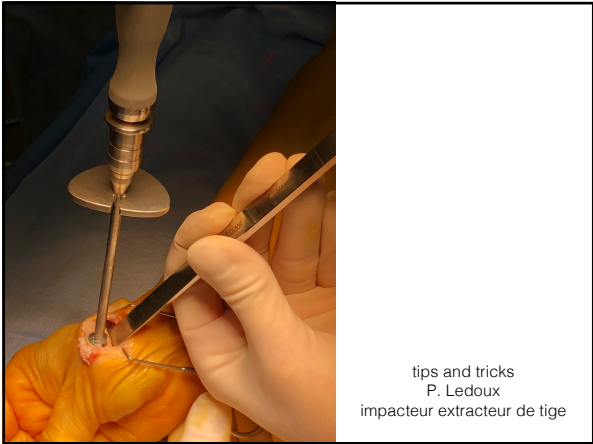
Complications	Martin Ferrero 1999-2002 (n=60)	Bricout Rezzout 2008-2010 (n=156)	TOFFOLI TESSIER 2006-2009 (n=36)	COOTJANS VANHAECKE 2003-2010 (n=168)	CAEKEBEKE DUERINCK 2011-2012 (n=50)
Tendinopathy		16 %			16 à 17%
Dislocation	6 %	4,5 %	1 %	4,8 %	0 %
Loosening	1,5 %	2,6 %	4,2 %	1% Loosening 1% Enfoncement	5% posttraumat 0% spontaneous
Surgical revision	4,6 %	11,5 %	4,2		4 %
Failure Trapezectomy	7,7 %	7,7 %	5,2 %	3 %	4 %
Survival rate	92,3 % at 10y	90,8% at 5y	93% at 6y	96% at 80m	96% à 56 m

P.Ledoux. Échec de prothèse totale trapézo-métacarpienne non cimentée. Ann Chir Main Memb Super 1997;16:215-21.

PROTHESE TMC: CHIRURGIE TECHNIQUEMENT DIFFICILE
La plupart des complications sont liées à des erreurs techniques.

- Stem: axis, size, quality of the bone
- Cup: fracture du trapeze, bad orientation of the cut, bad centralization of the cup, standard or semi-constrained cup
- Neck: straight ou angulated, double mobility





Full Length Article

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jhs.sagepub.com
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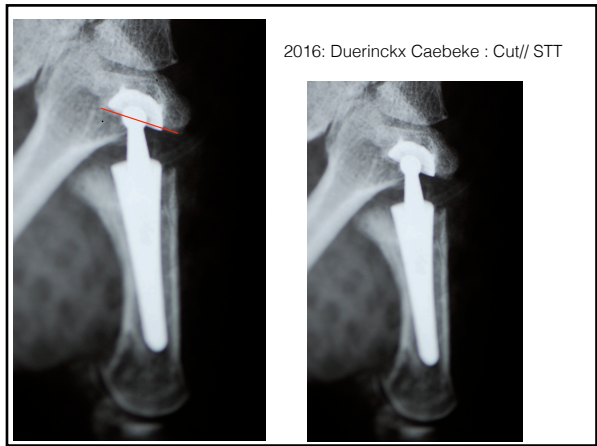
Trapezium anatomy as a radiographic reference for optimal cup orientation in total trapeziometacarpal joint arthroplasty

J. Duerinckx and P. Caekebeke

Cut // to the STT

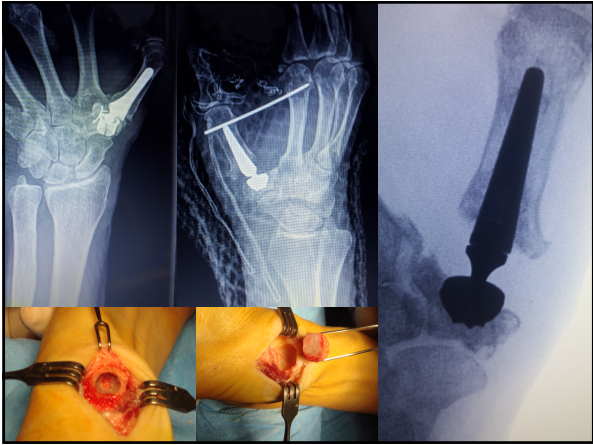
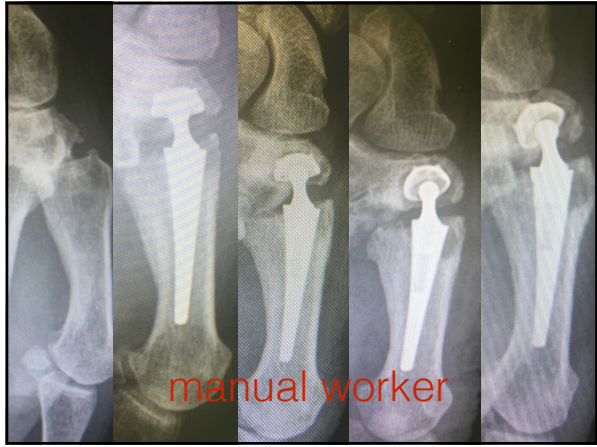
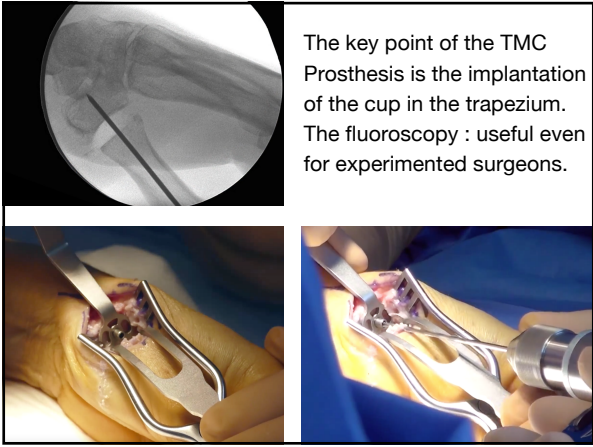
Diagram A: Shows trapezium anatomy with Adduction and Abduction lines. Labels include Dorsal, Metacarpal, Palmar, and Trapezium.

Diagram B: Shows trapezium anatomy with Extension and Flexion lines. Labels include Radial, Metacarpal, Trapezium, Ulnar, and Flexion.



The CUP:

- 1997 Ledoux: Centralized in the trapezium
- 2011 Lussiez: 22% cup malposition
- 2016-2019: Duerinckx // STT, no dorsal or lateral orientation



Dual mobility trapezium/carpal prosthesis
Biomechanical Principles
B. Lussiez MD, P. Ledoux MD, C. Falaise MD

Context:
Improvement of clinical and radiological results of TMC is due to mobility loss, neck position and to the trapezium shape and size amplified by the cup position and the cup fixation in the trapezium.
Failure is due to:
• early loosening
• cup loosening and tearing ligaments
• distal instability (DIP) (Fig 1)

Goal:
To prevent the biomechanical interests of a dual mobility hemispherical TM prosthesis:
• reduce the level of dislocations
• increase into a specific stability
• increase mobility

Biomechanical principles of Dual Mobility:

TO DIMINISH THE LEVEL OF DISLOCATIONS:
The risk of dislocation decreases when the radius of the cup increases. The radius of the cup should be increased to increase the level of stability. The radius of the cup should be increased to increase the level of stability. The radius of the cup should be increased to increase the level of stability.

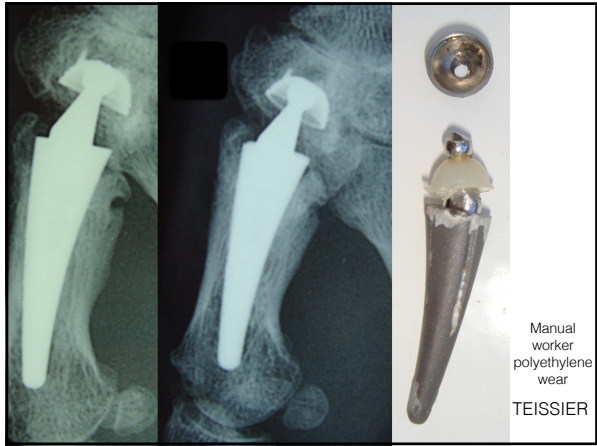
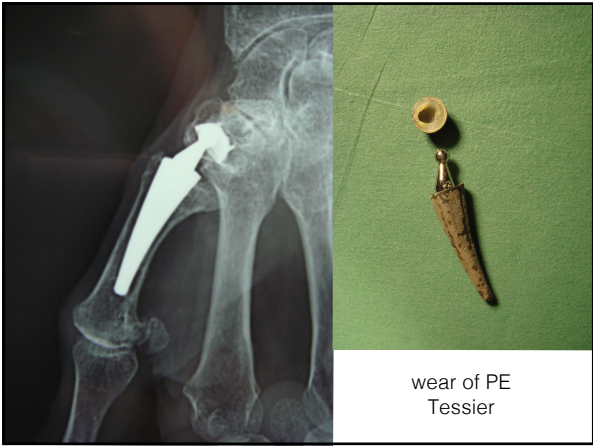
TO INCREASE THE MOBILITY AND TO DIMINISH THE RISK OF DISLOCATIONS:
The angle of rotation is shared between the cup and the ball. Thus, the angle of rotation is shared between the cup and the ball. Thus, the angle of rotation is shared between the cup and the ball. Thus, the angle of rotation is shared between the cup and the ball.

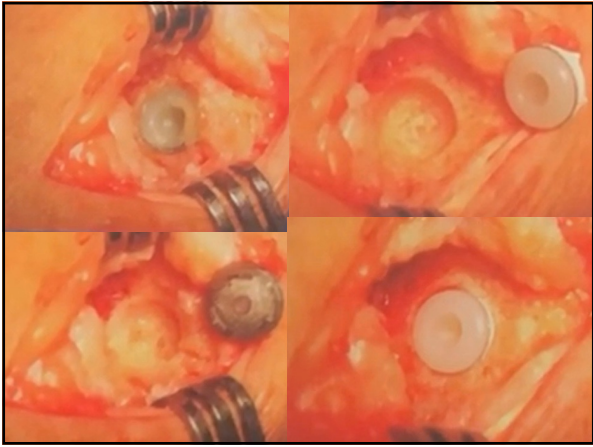
TO DIMINISH THE LEVEL OF TRAPEZIUM LOOSENING:
Due to mobility of the ball, the level of the ball on the trapezium is decreased. Due to mobility of the ball, the level of the ball on the trapezium is decreased. Due to mobility of the ball, the level of the ball on the trapezium is decreased.

CYCLIC/BIOMIMETIC/SHARP OF THE CAP:
Choice of a cyclic/hemispherical cap rather than a conical cap. Choice of a cyclic/hemispherical cap rather than a conical cap. Choice of a cyclic/hemispherical cap rather than a conical cap.

Conclusion:
The choice of a cyclic/hemispherical cap rather than a conical cap. The choice of a cyclic/hemispherical cap rather than a conical cap. The choice of a cyclic/hemispherical cap rather than a conical cap.

TOUCH GEM 2015 LUSSEZ LEDOUX FALAISE





CONCLUSION

The TMC prosthesis is a technically demanding procedure. Most of the complications are correlated to technical errors.
Failure rate 8 >3-4%
Survival rate at 5 y: 92>96%
Survival rate at 10 y: 90%