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Dual Mobility Prostheses Versus Suspension Arthroplasty for the Treatment of the First Carpometacarpal Joint Osteoarthritis: A 2-Year Follow-Up Prospective Study

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Abstract

Background/Objectives: Trapeziometacarpal osteoarthritis (TMC OA) is a common disabling condition. This study compared clinical and radiographic outcomes of trapeziectomy with suspension arthroplasty and dual mobility TMC joint replacement in a prospective comparative cohort study design. **Methods**: A prospective comparative study was conducted on 122 patients contributing 129 hands with Eaton–Littler stage II–III TMC osteoarthritis. Patients were treated with trapeziectomy with suspension arthroplasty (58 patients, 60 hands) or TMC joint replacement with a dual mobility prosthesis (64 patients, 69 hands), based on surgical indication and shared decision-making. Clinical and radiographic evaluations were performed up to 24 months postoperatively. **Results**: Both techniques significantly improved pain, function, range of motion, and strength ($p < 0.05$). Joint replacement provided faster pain relief and functional recovery, with superior strength at all follow-up points. At 12 months, pain and functional outcomes were comparable between groups. No implant loosening or failures were observed. **Conclusions**: Both surgical techniques are effective for TMC osteoarthritis. Dual mobility TMC joint replacement allows faster recovery and greater strength, while achieving comparable mid-term clinical outcomes to suspension arthroplasty.

Keywords: trapeziometacarpal osteoarthritis; suspension arthroplasty; dual mobility prostheses

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1. Introduction

Thumb carpometacarpal (TMC) osteoarthritis is a disabling condition, typically presenting with pain at the base of the thumb, decreased grip strength and crepitus during thumb motion [1]. It primarily affects post-menopausal women and increases steadily with age in both genders [2]. It is more prevalent than knee or hip osteoarthritis and represents the second most common site of hand OA after the distal interphalangeal joints [3] and affects up to 20% of adults over 55 [4].

The primary goal of treating TMC OA is to alleviate pain and restore thumb and hand function. Several surgical techniques have been suggested to treat TMC OA if conservative treatment fails [5]. Trapeziectomy, either alone or in combination with tendon interposition or suspension arthroplasty, is considered the gold standard procedure [6,7]. Despite its

widespread use, however, there is no consensus in the literature regarding the superiority of one arthroplasty technique over another, or indeed whether arthroplasty is preferable to alternative surgical approaches [5]. Although generally effective, these procedures have some limitations, including slow recovery time, weak pinch, joint instability, and, due to excision of the trapezium, altered thumb biomechanics [6–8].

In 1971, De la Caffinière [9] introduced a cemented trapeziometacarpal (TMC) prosthesis with a ball-in-socket design to restore motion and stability of the first carpometacarpal joint, while restoring thumb length and relieving pain [5,10–12]. The first generations of these implants were associated with high complication rates, including dislocation and loosening. In contrast, newer-generation implants feature a more anatomical design, are press-fit and incorporate dual mobility concepts. As a result, complication rates have been markedly reduced [13], with reported TMC prosthesis survival rates of 94–95% at ten-year follow-up [7,14].

Compared with trapeziectomy, these prostheses have been shown to provide faster pain relief and functional recovery, showing superior short-term outcomes when both procedures are performed in the same patient [15]; however, trapeziectomy remains associated with a lower overall complication rate [16].

This procedure involves replacement of the TMC joint with the objective of preserving physiological thumb length, thereby optimizing grip strength and joint stability [17]. The application of the dual mobility concept to trapeziometacarpal arthroplasty has been shown to significantly enhance prosthetic stability [11]. Clinical outcomes demonstrate improvements in key-pinch strength, increased thumb opposition as assessed by the Kapandji score, and effective pain reduction [11,18]. Furthermore, the dual mobility trapeziometacarpal prosthesis has proven to be a reliable treatment option for the correction of pre-existing metacarpophalangeal joint hyperextension [19]. The aim of this study is to analyze and compare the clinical and radiographic outcomes at 24 months of follow-up between two different treatment techniques for TMC OA: trapeziectomy with suspension arthroplasty [20] and total trapeziometacarpal joint replacement using a dual mobility prosthesis.

2. Materials and Methods

This prospective study included patients affected by TMC OA who underwent either trapeziectomy with suspension arthroplasty according to Altissimi [20] or TMC joint replacement using Touch® (KeriMedical; Geneva, Switzerland) or Maïa® (Lepine, Genay, France) implants at the Orthopaedics and Traumatology Unit of Sant'Andrea University Hospital in Rome.

Inclusion criteria were: pain at the base of the thumb at rest or during activities of daily living, and refractory to at least three months of conservative treatment; radiographic evidence of TMC OA classified as Eaton–Littler stage II or III on standard plain radiographs [21,22]. Exclusion criteria included radiographic evidence of scaphoid-trapezium-trapezoid OA, corresponding to Eaton–Littler stage IV OA; poor trapezial bone quality on preoperative radiographs (e.g., subchondral cysts, osteoporosis or trapezium thickness inferior to 8 mm); previous fractures of the trapezium, first metacarpal or thumb phalanges or dislocations of the TMC, metacarpophalangeal or interphalangeal joints; pre-existing comorbidities affecting the same hand, such as carpal tunnel syndrome, trigger finger or De Quervain's tenosynovitis.

All patients provided written informed consent prior to participation. According to the surgical procedure performed, patients were allocated to one of two groups: the suspension arthroplasty group, which included patients treated with trapeziectomy and suspension arthroplasty, and the joint replacement group, which included patients treated with TMC arthroplasty using dual mobility Touch® or Maïa® implants.

In both groups, some patients underwent bilateral procedures. In such cases, surgeries were performed with a minimum interval of six months to allow complete functional recovery of the hand. The study protocol was approved by the local ethics committee.

2.1. Surgical Techniques

In both groups, antibiotic prophylaxis was administered using an intravenous first-generation cephalosporin. All procedures were performed under locoregional anesthesia with application of an upper-limb tourniquet.

The prostheses used in this study were Touch® (KeriMedical; Geneva, Switzerland) and Maïa® (Lepine, Genay, France) implants, both of which are modular, cementless, dual mobility prostheses. The cups were hemispherical and truncated for Touch® and hemispherical for Maïa®. The neck components were available in straight or 15° angled configurations for Touch® system, and in a 15° angled configuration for Maïa® system.

A longitudinal dorsoradial skin incision of approximately 2–3 cm was made, centered over the TMC joint. The dorsal superficial sensory branches of the radial nerve and the dorsal branch of the radial artery were identified and carefully protected. A longitudinal capsulotomy was performed dorsal to the extensor pollicis brevis. An osteotomy perpendicular to the longitudinal axis of the first metacarpal was performed to remove its articular surface. Preparation of the medullary canal of the first metacarpal and the trapezium was then performed. Stability and mobility tests were performed with the trial components. Once satisfactory stability and mobility were confirmed, the definitive components were implanted.

In the trapeziectomy group, trapeziectomy and suspensionplasty were performed according to Altissimi [20].

A curvilinear longitudinal incision of approximately 2–3 cm was performed on the radial aspect of the TMC joint. The dorsal sensory branches of the radial nerve, the dorsal branch of the radial artery, and the abductor longus pollicis and extensor pollicis brevis tendons were identified and protected. The trapezium was then excised either en bloc or after fragmentation with a chisel, taking care to preserve the flexor carpi radialis (FCR) tendon, which is adherent to the trapezium. A segment approximately 3–4 cm in length of the flexor carpi radialis half tendon is then harvested, while preserving its distal insertion at the base of the second metacarpal. This tendon strip was passed under the base of the first metacarpal and fixed on the radial aspect of its base using a 2 mm anchor. Excess tendon distal to the anchor was excised. This tendon construct provided suspension stabilization of the first metacarpal over the void left by the trapeziectomy.

2.2. Post-Operative Protocol

The surgical wound was inspected approximately 7 days after surgery and sutures were removed at 14 days postoperatively.

Patients in the prosthesis group were immobilized in a thumb spica splint for the first postoperative week and were subsequently encouraged to begin active thumb mobilization.

Patients in the suspensionplasty group were immobilized with a wrist brace including the thumb for the first three postoperative weeks. After brace removal, patients initiated a standardized rehabilitation program aimed at restoring full range of motion and grip strength of the hand and thumb.

2.3. Clinical and Radiographic Evaluations

Clinical and radiographic assessments were performed preoperatively and at 1, 3, 6, 12 and 24 months postoperatively. [Table 1].

Table 1. Values at different follow-up intervals.

Month of Follow-Up		Pre-op	1	3	6	12	24
VAS, mena ± SD	prosthesis	8.33 ± 1.86	1.8 ± 0.9	0.3 ± 0.4	0.2 ± 0.4	0.3 ± 0.86	0 ± 0
	arthroplasty	9 ± 2	7.5 ± 1.05	4.1 ± 2.5	2.2 ± 1.2	0.8 ± 1.2	0.3 ± 0.5
		MD −0.67 (95% CI −1.34 to 0.00) Cohen's d ≈ 0.35	MD = −5.7 (95% CI: −6.04 to −5.36) Cohen's d ≈ 5.88	MD = −3.8 (95% CI: −4.44 to −3.16) Cohen's d ≈ 2.20	MD = −2.0 (95% CI: −2.32 to −1.68) Cohen's d ≈ 2.30	MD = −0.5 (95% CI: −0.87 to −0.14) Cohen's d ≈ 0.49	MD = −0.3 (95% CI: −0.43 to −0.17) Cohen's d ≈ 0.88
DASH, mean ± SD	prosthesis	57 ± 15	35 ± 15	13 ± 9	11 ± 11	8.6 ± 8.8	8 ± 11
	arthroplasty	67 ± 13	60 ± 16	26 ± 14	21 ± 9.1	18 ± 8.6	13 ± 6
		MD = −10 (95% CI: −14.84 to −5.16) Cohen's d ≈ 0.71	MD = −25 (95% CI: −30.37 to −19.63) Cohen's d ≈ 1.62	MD = −13 (95% CI: −17.14 to −8.86) Cohen's d ≈ 1.12	MD = −10 (95% CI: −13.47 to −6.53) Cohen's d ≈ 0.98	MD = −9.4 (95% CI: −12.40 to −6.40) Cohen's d ≈ 1.08	MD = −5 (95% CI: −8.00 to −2.00) Cohen's d ≈ 0.55
Hand grip (Kg), mean ± SD	prosthesis	11 ± 3.6	12.3 ± 4.9	16.9 ± 5.8	18.66 ± 1.15	26.2 ± 10.5	29.6 ± 7.6
	arthroplasty	12.7 ± 2.62	8.14 ± 3.7	9.42 ± 1.9	15.42 ± 7.74	21.57 ± 10.53	22.8 ± 7.74
		MD = −1.7 (95% CI: −2.78 to −0.62) Cohen's d ≈ 0.53	MD = 4.16 (95% CI: 2.67 to 5.65) Cohen's d ≈ 0.95	MD = 7.48 (95% CI: 6.03 to 8.93) Cohen's d ≈ 1.68	MD = 3.24 (95% CI: 1.26 to 5.22) Cohen's d ≈ 0.61	MD = 4.63 (95% CI: 0.98 to 8.28) Cohen's d ≈ 0.44	MD = 6.8 (95% CI: 4.15 to 9.45) Cohen's d ≈ 0.89
Tip Pinch (Kg), mean ± SD	prosthesis	3 ± 1	3.3 ± 1.5	4 ± 0.8	4.66 ± 1.15	5.5 ± 1.2	5 ± 0
	arthroplasty	2.55 ± 1.4	1.2 ± 0.69	2.42 ± 0.99	3 ± 0.7	3.11 ± 1.4	3.28 ± 1.49
		MD = 0.45 (95% CI: 0.02 to 0.88) Cohen's d ≈ 0.38	MD = 2.1 (95% CI: 1.71 to 2.49) Cohen's d ≈ 1.76	MD = 1.58 (95% CI: 1.27 to 1.89) Cohen's d ≈ 1.78	MD = 1.66 (95% CI: 1.34 to 1.98) Cohen's d ≈ 1.71	MD = 2.39 (95% CI: 1.94 to 2.84) Cohen's d ≈ 1.84	MD = 1.72 (95% CI: 1.34 to 2.10) Cohen's d ≈ 1.69
Key Pinch (Kg), mean ± SD	prosthesis	2.94 ± 0.98	3.44 ± 0.9	3.5 ± 0.89	3.8 ± 0.8	4.5 ± 1.8	5.5 ± 2.1
	arthroplasty	2.57 ± 1.39	2.16 ± 0.6	2.57 ± 1.42	2.92 ± 1.4	3.91 ± 0.9	5.25 ± 0.6
		MD = 0.37 (95% CI: −0.05 to 0.79) Cohen's d ≈ 0.31	MD = 1.28 (95% CI: 1.02 to 1.54) Cohen's d ≈ 1.64	MD = 0.93 (95% CI: 0.51 to 1.35) Cohen's d ≈ 0.80	MD = 0.88 (95% CI: 0.48 to 1.28) Cohen's d ≈ 0.79	MD = 0.59 (95% CI: 0.11 to 1.07) Cohen's d ≈ 0.41	MD = 0.25 (95% CI: −0.27 to 0.77) Cohen's d ≈ 0.16
Kapandji, mean ± SD	prosthesis	8.54 ± 1.23	9.44 ± 0.8	10 ± 0	9.5 ± 0.9	9.75 ± 0.4	9.5 ± 0.7
	arthroplasty	7.77 ± 3.11	7.8 ± 0.7	9 ± 0.8	8.37 ± 3.46	9.62 ± 0.7	9 ± 3.73
		MD = 0.77 (95% CI: −0.07 to 1.61) Cohen's d ≈ 0.34	MD = 1.64 (95% CI: 1.38 to 1.90) Cohen's d ≈ 2.18	MD = 1.00 (95% CI: 0.80 to 1.20) Cohen's d ≈ 1.82	MD = 1.13 (95% CI: 0.23 to 2.03) Cohen's d ≈ 0.46	MD = 0.13 (95% CI: −0.07 to 0.33) Cohen's d ≈ 0.23	MD = 0.50 (95% CI: −0.46 to 1.46) Cohen's d ≈ 0.19

Clinical evaluation in both groups included the Visual Analog Scale (VAS) and Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire to assess pain and functional impairment in daily life activities. Thumb opposition was evaluated using the Kapandji test. Hand strength was assessed using a dynamometer, measuring grip strength, tip pinch and key pinch.

Radiographic evaluation consisted of standardized anteroposterior and lateral radiographs of the hand, obtained at each follow-up interval. In the prosthesis group, radiographs were assessed for the presence of radiolucent lines, dislocation, loosening or migration of prosthetic components. In the suspensionplasty group, metacarpal collapse and subsequent thumb length were evaluated.

2.4. Statistical Analysis

Statistical analyses were conducted using analysis of variance (ANOVA) for repeated measures to assess the evolution of scores over time within each surgical group (prosthesis and suspension arthroplasty). Pairwise comparisons between follow-up timepoints (preoperative, 3 months, 6 months, 12 months, and 24 months) were performed using Bonferroni correction to adjust for multiple testing. A p-value < 0.05 was considered statistically significant. The unit of analysis is the individual hand.

3. Results

A total of 122 patients (129 hands) met the inclusion criteria and were prospectively assigned to one of two treatment groups: 64 patients (16 males and 48 females) were assigned to the prosthesis group, accounting for 69 hands treated with TMC joint replacement. In total, 58 patients (12 males and 46 females) were assigned to the suspensionplasty group, accounting for 60 hands treated with trapeziectomy and suspensionplasty according to Altissimi [20]. [Table 2].

Table 2. Parameters of treated patients.

Parameters	Total Patients, 122
Age, mean ± (range), years	62.80 ± 5.56 (44–84)
Gender, n (%)	
Females	94 (77.05)
Males	28 (22.95)
Eaton–Littler Stage, mean ± (range)	2.77 ± 0.30 (2–3)
Dominance, n (%)	
Prosthesis	69 (53.49)
Arthroplasty	60 (46.51)
Prosthesis implanted, n (%)	
Touch	46 (66.7)
Maïa	23 (33.3)

Note. n = number.

No statistically significant differences were observed between the two groups in preoperative demographic or clinical data.

3.1. Pain and Hand Function

A VAS score ≤ 2 was achieved by more than 95% of hands at the 12-month follow-up in the suspensionplasty group and as early as the 1-month follow-up in the prosthesis group. Similarly, a DASH score less than 35 was observed in more than 95% of hands at the 1-month follow-up in the prosthesis group and at the 3-month follow-up in the suspensionplasty group.

ANOVA demonstrated a significant difference between preoperative and 2-year follow-up VAS values ($p < 0.0001$). Bonferroni correction showed that, in the prosthesis group, the greatest improvement in pain occurred between preoperative assessment and 3 months ($p < 0.001$). Overall, ANOVA confirmed a significant reduction over time in both groups ($p < 0.0001$), with earlier improvement observed in the prosthesis group.

Similarly, ANOVA revealed a significant difference between preoperative and 2-year follow-up DASH scores ($p < 0.0001$). Bonferroni correction indicated that, in the prosthesis group, the most pronounced functional improvement occurred between preoperative evaluation and 3 months ($p < 0.001$). In the suspension arthroplasty group, functional improvement appeared later, progressing up to 12 months ($p < 0.001$).

Overall, these findings indicate that while both surgical techniques achieve excellent long-term functional outcomes, total joint replacement with a dual mobility prosthesis is associated with a faster recovery during the early postoperative period.

3.2. Hand Strength

The Kapandji opposition test showed significant improvement at the 3-month follow-up in the prosthesis group and at the 6-month follow-up in the suspensionplasty group, with a score of 8 or higher achieved by more than 90% of hands at the 3 month follow-up in the prosthesis group and at the 6 month follow-up in the suspensionplasty group.

Regarding the Kapandji opposition test, a significant ($p < 0.001$) interaction between time and treatment indicated earlier functional improvement in the prosthesis group, with comparable outcomes between groups at long-term follow-up.

With regard to strength outcomes, hands treated with joint replacement demonstrated a statistically significant improvement in all strength tests at the 3-month follow-up. In contrast, hands who underwent trapeziectomy and suspensionplasty showed significant improvements in hand grip and key pinch strength at the 6-month follow-up, with tip pinch strength reaching statistical significance only at the final follow-up.

Handgrip strength demonstrated significant effects of time ($p < 0.001$) and treatment ($p < 0.001$), with patients in the prosthesis group consistently showing higher values than those in the suspension arthroplasty group. A significant time between treatment interaction ($p = 0.001$) indicated a slightly faster recovery trajectory in the prosthesis group.

For key pinch strength, a significant effect of time was observed ($p = 0.025$), indicating overall improvement throughout follow-up. However, neither the main effect of treatment nor the time between treatment interaction reached statistical significance. Despite this, patients in the prosthesis group generally demonstrated higher key pinch values across follow-up, particularly during the early postoperative period.

Similarly, pulp pinch strength showed a significant improvement over time along with a main effect treatment ($p = 0.041$). Patients treated with a prosthesis generally performed better, especially at the 1- and 3-month follow-ups. However, no significant interaction was found between time and treatment. Overall, these results highlight a quicker recovery of pinch and grip strength after total joint replacement, even though both surgical approaches lead to comparable long-term outcomes.

3.3. Satisfaction

Regarding patient-reported satisfaction with the dual-mobility TM prosthesis, most patients achieved high levels of satisfaction, with 46 patients (71.9%) rating their outcome as excellent and 18 patients (28.1%) as very good.

In contrast, outcomes following suspension arthroplasty were comparatively less favorable. At the latest follow-up, 10 patients (17.2%) reported an excellent outcome, 21 patients (36.2%) a very good outcome, and 27 patients (46.6%) a good outcome.

3.4. Radiographic Results

In the prosthesis group, radiolucent lines were observed at the final follow-up in 4 hands (5.8%) around the stem and in 6 hands (8.7%) around the cup. All radiolucent areas surrounding the cup were classified as stage 1 according to the Lussiez classification [11]. Among the radiolucent lines identified around the stem, 3 hands (4.3%) were classified as stage 1 and 1 hand (1.4%) as stage 2. These radiographic findings showed no correlation with clinical symptoms, including pain or reduced performance on clinical outcome measures. In the remaining hands who underwent joint replacement, plain radiographs demonstrated complete osseointegration with no evidence of heterotopic ossification.

In the trapeziectomy and suspensionplasty group, comparison of thumb length between the operated and contralateral hands revealed collapse of the first metacarpal in all hands at the 24-month follow-up, with a mean shortening of 6.4 mm (66.7% of hands exhibiting shortening > 3.9 mm). No association was identified between these radiographic findings and pain or decreased clinical outcome scores.

3.5. Complications

Tendon-related complications were observed in both treatment groups.

In the joint replacement group, 7 hands (10.1%) developed De Quervain's tenosynovitis, and 4 hands (5.8%) experienced transient hypoesthesia or paresthesia on the dorsum of the thumb. These complications resolved spontaneously in most cases; however, three cases of De Quervain's tenosynovitis required corticosteroid injection with methylprednisolone, and one case required surgical release.

In the trapeziectomy and suspensionplasty group, 7 hands (11.6%) developed transient hypoesthesia or paresthesia on the dorsum of the thumb, and 6 hands (10.0%) developed flexor carpi radialis tendinopathy. None of these patients required surgical intervention, as conservative management with physiotherapy was sufficient to resolve symptoms.

No cases of infection, implant dislocation, or persistent pain were observed in either treatment group.

4. Discussion

Surgical treatment of TMC OA remains a subject of considerable debate in hand surgery. Trapeziectomy, with or without tendon interposition or tenosuspension, is the most widely used surgical technique and is often considered the current "gold standard" [5,7,12,23,24]. However, this procedure is associated with a prolonged period of immobilization, alteration of thumb biomechanics secondary to trapeziectomy, delayed functional recovery, and reduced restoration of strength [7,8,25,26].

With the introduction of new-generation prostheses and refinement of implantation techniques, joint arthroplasty has shown a reduction in complication rates and an improvement in implant survival [13,27–30]. Both surgical techniques investigated in this study may be complicated by infection or wound dehiscence; however, prosthetic replacement is additionally associated with specific major complications, including aseptic loosening, wear, dislocation, and trapezial fracture. Overall, complications related to joint replacement appear to occur more frequently than those associated with trapeziectomy with or without tendon interposition or suspension [10,26,30].

To date, no high-quality evidence has definitively demonstrated the superiority of one surgical technique over another for the treatment of TMC OA [5,12,26,30]. This lack of consensus is largely attributable to the low methodological quality of published studies, heterogeneity in outcome measures, and relatively short follow-up periods, particularly in studies evaluating TMC prostheses [10].

In this series, both total joint replacement with a dual-mobility prosthesis and trapeziectomy with suspension arthroplasty resulted in significant improvements in pain, function, and strength over time. However, prosthetic replacement was associated with faster early recovery in VAS, DASH, and strength outcomes. At long-term follow-up, clinical outcomes were comparable between groups. Patient satisfaction was high in both cohorts, with a higher proportion of excellent results in the prosthesis group. Despite these findings, the results of this study do not allow us to conclude that prosthetic replacement is superior to suspension arthroplasty, as both techniques achieved excellent clinical outcomes and high patient satisfaction.

Although radiolucent lines around the stem and cup were observed in a subset of hands, no cases of implant loosening, dislocation, wear, or fracture were identified, and implant survival was 100% at final follow-up [11,14,25,31,32]. Nevertheless, this represents a limitation of the present study, given the relatively short period of two years.

5. Conclusions

In conclusion, prosthetic replacement of the TMC joint and trapeziectomy with tendon suspension both appear to be safe and effective surgical options for the treatment of TMC osteoarthritis. Both techniques provide excellent pain relief and functional recovery; however, prosthetic replacement appears to achieve these outcomes more rapidly. In addition, prostheses offer superior grip strength and preserve the trapezium, resulting in a less invasive procedure. However, the present study is subject to several limitations. In particular, the inclusion of bilateral cases may introduce bias due to non-independence of observations, as outcomes from the same patient are not statistically independent. In addition, heterogeneity in postoperative rehabilitation protocols between patients represents a potential confounding factor that may have influenced functional recovery and outcome measures.

Our findings appear to be consistent with those of a prospective randomized study comparing trapeziectomy with tendon interposition arthroplasty and total joint replacement using a TMC prosthesis [33]. While these findings are encouraging, they should be interpreted in the context of the study's limitations and relatively short follow-up period, which precludes any definitive conclusions regarding long-term implant performance or durability. Longer-term studies are necessary to assess implant survivorship and to monitor the progression of subtle periprosthetic radiolucent changes over time.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

TMC OA	Trapeziometacarpal osteoarthritis
TMC	Trapeziometacarpal
OA	Osteoarthritis
VAS	Visual Analog Scale
DASH	Disabilities of the Arm Shoulder and Hand
SD	Standard deviation

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