

Trapezium arthroplasty with silicone rubber implantation for advanced osteoarthritis of the trapeziometacarpal joint of the thumb

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Introduction: Arthritis in the trapeziometacarpal joint of the thumb can cause swelling and loss of motion. Treatment options include arthrodesis, replacement arthroplasty and interposition arthroplasty. Our objective in this clinical study was to determine outcomes after trapezium arthroplasty with a silicone rubber implant and the relationship between self-reported and measured outcomes. **Methods:** At the Hand and Upper Limb Centre, St. Joseph's Hospital, London, Ont., a tertiary care centre, we reviewed a series of 26 patients with advanced osteoarthritis who underwent silicone rubber trapezium arthroplasty. The follow-up averaged 6.5 years. We assessed the outcomes subjectively, and by clinical, functional and radiographic examination. **Results:** Although 88% of patients reported some improvement in pain and satisfaction, when quantified the improvement was less impressive: only 5.7 (on a visual analogue scale of 1–10, poor–excellent) for pain and 5.6 for satisfaction. Superior subjective results were reported by patients older than 60 years. Osteoarthritic changes had caused pronounced functional impairment in the hands of patients who underwent surgery and those who did not, so that any long-term benefit of surgery was not measurable. Patients had difficulty manipulating both small and large objects on the Jebsen's hand function test. Peri-implant and carpal radiographic lytic changes were observed in 90% of patients. Six patients (20%) required revision surgery (3 early, 3 late), including 1 with a pathologic scaphoid fracture. **Conclusions:** Although clinical, functional and radiographic results were poor, they did not predict either satisfaction or pain improvement reported by patients, illustrating the need for a comprehensive standardized outcome evaluation to make informed decisions on the value of surgical intervention for osteoarthritis of the trapeziometacarpal joint.

Introduction : La présente d'arthrite dans l'articulation trapéziométacarpienne du pouce peut provoquer l'enflure et une perte de mouvement. Les traitements possibles comprennent l'arthrodèse, l'arthroplastie de remplacement et l'arthroplastie avec interposition. Cette étude clinique visait à déterminer les résultats après une arthroplastie du trapèze au moyen d'un implant en caoutchouc au silicone et le lien entre les résultats autodéclarés et les résultats mesurés. **Méthodes :** Au Centre de la main et des membres supérieurs de l'Hôpital St. Joseph's de London (Ontario), centre de soins tertiaires, nous avons étudié une série de 26 patients atteints d'arthrose avancée qui ont subi une arthroplastie du trapèze réalisée au moyen de caoutchouc au silicone. Le suivi a duré en moyenne 6,5 ans. Nous avons évalué les résultats subjectivement et au moyen d'un examen clinique, fonctionnel et radiographique. **Résultats :** Même si 88 % des patients ont signalé une atténuation de la douleur et une amélioration de la satisfaction, lorsqu'on l'a quantifiée, l'amélioration était moins impressionnante : elle s'établissait à 5,7 seulement (sur une échelle analogique visuelle de 1 à 10 représentant de médiocre à excellente) pour la douleur et à 5,6 pour la satisfaction. Les patients de plus de 60 ans ont déclaré de meilleurs résultats subjectifs. Les changements liés à l'arthrose avaient causé une incapacité fonctionnelle marquée dans les mains des patients opérés et non opérés, de sorte qu'il a été impossible de mesurer les avantages à long terme de l'intervention chirurgicale. Les patients avaient de la difficulté à manipuler les petits et les gros objets au cours du test de fonction manuelle de Jebsen. On a observé par radiographie des changements lytiques aux niveaux carpien et périphérique de l'implant chez 90 % des patients. Six patients (20 %) ont eu besoin d'une révision chirurgicale (3 au début, 3 à la fin) dont un qui avait une fracture pathologique

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du scaphoïde. **Conclusions :** Même si les résultats cliniques, fonctionnels et radiographiques étaient médiocres, ils ne permettaient pas de prédire l'amélioration de la satisfaction ou l'atténuation de la douleur signalées par les patients, ce qui démontre le besoin d'une évaluation intégrée et normalisée des résultats afin de prendre des décisions éclairées sur la valeur de l'intervention chirurgicale dans les cas d'arthrose de l'articulation trapéziométacarpienne.

Positioning of the thumb away from the palm through movement at the trapeziometacarpal joint is critical to hand function. Arthritis can affect the trapezium, the surrounding carpal bones and first metacarpal, resulting in pain, swelling and loss of motion of the basal thumb joint. Typical radiographic changes in osteoarthritis (OA) of the basal joint include joint narrowing, subchondral condensation of bone, osteophyte formation and radial and proximal subluxation of the first metacarpal. This typically progresses, leading to instability, crepitation and deformity.^{1,2} Options for surgical treatment include arthrodesis,³ replacement arthroplasty⁴ and interposition arthroplasty.⁵

Silicone rubber trapezium arthroplasty was pioneered by Swanson,^{1,4} who reported good long-term results in pain relief and patient satisfaction. In long-term follow-up of 150 cases, Swanson and colleagues² reported that patients, who were primarily female with OA, could perform 80% of their activities of daily living (ADL) with minimal pain. Strength was higher than preoperative values, and 78% of patients had improved ability to perform ADL.² Although this positive outlook was supported by others,⁶⁻¹² concerns have increased over time regarding the complications of silicone arthroplasty. Significant complications that occur after silicone arthroplasty include instability, deformation, implant failure and silicone synovitis. The most serious concerns with silicone rubber trapezium arthroplasty are the high incidence of implant instability and silicone synovitis.⁷⁻¹⁵

The literature on silicone rubber trapezium arthroplasty suggests these complications may lead to reduced function in patients with increased us-

age over time. Previous case series have focused on the prevalence of complications and radiographic changes. We were interested to know 1) if the prevalence of complications was similar in our patients and 2) whether patients' self-report of pain relief and satisfaction reflected the objective outcomes with this procedure.

Method

Patients

A clinical and radiographic review was performed on patients who underwent a silicone rubber trapezium arthroplasty performed by a single hand surgeon (J.H.R.), between 1983 and 1992. The indication for surgery was disabling pain due to primary OA of the trapeziometacarpal joint that was unresponsive to non-operative management. Thirty-six patients with a minimum follow-up of 12 months were eligible for the study. Three patients died, 3 patients could not be reviewed because they were medically unwell, 1 had emigrated, 2 refused and 2 were lost to follow-up. Twenty-five patients (30 implants) were reviewed, representing 76% of the surviving population.

Self-reported effectiveness

Subjective evaluation included a 5-item questionnaire with a visual analogue scale (VAS). The patients were asked to compare the current status of their hand to their preoperative status with respect to pain, hand and wrist movement, strength, ability to perform ADL and overall satisfaction. The options ranged from completely worse (left end), to no change (centre) to completely better (right end). The position marked on the VAS was converted to

a percentage change score. Pilot testing of the questionnaire reliability indicated that it was very high.

Objective measures of effectiveness

Objective clinical assessment included examination of the wrist and thumb for swelling, tenderness and range of motion (ROM). Clinical stability was studied for evidence of subluxation or dislocation. Grip strength was measured with the JAMAR dynamometer (Sammons Preston, Bolingbrook, Ill.) (position 2) according to standardized methods.¹⁶ Tip and key pinch were measured with a B and L pinch strength meter (Instron, Canton, Mass.).¹⁷ The Purdue pegboard¹⁸ and Jebsen's test of hand function¹⁹ were evaluated according to previously described methods. Scores from these tests were compared with published normative values, stratified on the basis of age and hand dominance.

Standard posteroanterior and lateral radiographs of both wrists were obtained with the thumb in abduction. These were reviewed independently of the surgeon (J.H.R.) and clinical information. Each radiograph was assessed for the following:

- Prosthetic wear was assessed by measuring the relative height of the ulnar versus radial borders of the prosthesis (Fig. 1).¹³
- Prosthetic position with respect to the distal pole of the scaphoid was measured in millimetres from the radial border of the scaphoid to the ulnar border of the prosthesis (Fig. 2). Subluxation was defined as less than 80% articulation.⁹
- Osseous changes were evaluated in the thumb metacarpal, scaphoid and carpus according to the grading system developed by

Creighton and associates.⁷

- Radiographs of the contralateral wrist were also assessed for evidence of osteoarthritis.

Statistical analysis

Tests of difference between operated and nonoperated hands were performed using paired t-tests. Tests between subgroups (age) were performed using a standard independent samples t-test. The Pearson correlation coefficient was used as the measure of association. All statistical analyses were performed in Sigma-Stat (SPSS Science) ($\alpha = 0.05$).

Surgical technique

The surgical technique was similar to that reported by Sotereanos and colleagues.¹¹ The procedure was performed under tourniquet control with 3.5× loupe magnification. A dorsoradial longitudinal incision was centred over the trapeziometacarpal joint, and the superficial radial nerve and radial artery were identified and

protected. The first extensor compartment was released and the abductor pollicis longus (APL) muscle divided. A capsulotomy was then made and the trapezium was excised en bloc. The base of the thumb metacarpal was resected perpendicular to the shaft and the intramedullary canal reamed to accept the implant stem. A trial prosthesis was inserted and assessed for seating. If the prosthesis tended to subluxate, an appropriate portion of the trapezoid bone was excised. A Swanson high performance, silicone rubber trapezoidal implant was then inserted into the intramedullary canal. Two absorbable Vicryl sutures were passed through the implant and into the flexor carpi radialis muscle, in the ulnar volar aspect of the wound. The prosthesis was assessed for stability and the thumb for ROM. The capsule was imbricated and the abductor pollicis longus reattached and plicated to reinforce the repair. All but 7 of the 30 thumbs had a metacarpophalangeal joint fusion, stabilized with a temporary percutaneous Kirschner wire at 30° of flexion. A below-elbow bulky dressing was applied with the thumb in abduction. After 1 week, a thumb spica cast was applied and worn for 5 weeks. Six weeks after the operation if there was radiographic evidence of metacarpophalangeal joint fusion, the Kirschner wire was removed. Hand

therapy was begun, and the patients were allowed to return to ADL. Hand therapy consisted of gradual strengthening and functional activity. Home programs were typically used.

Results

Patient characteristics are reported in Table 1. Average follow-up was 6.5 years (median 6.6), with 50% of the patients being tested between 3 and 10 years after operation. Contralateral osteoarthritis was noted in 80% of the patients.

Eighty-eight percent of patients reported some pain improvement and 75% were satisfied. Patients rated the average amount of improvement in pain as 5.7/10, and their satisfaction as 5.6/10. The least improvement was reported in strength (Table 2). Superior subjective results were noted in patients more than 60 years

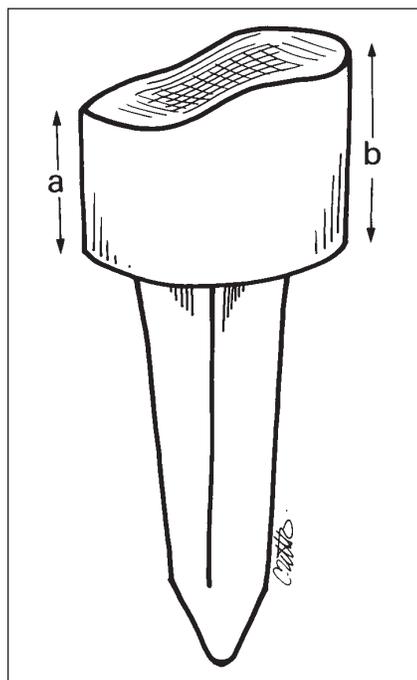


FIG. 1. This diagram shows prosthetic wear. Percent prosthetic wear is measured by comparing the ulnar border (a) to the radial border (b) of the prosthesis.

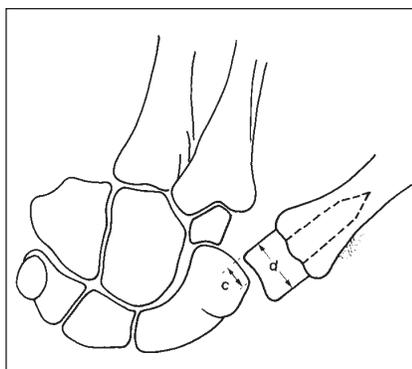


FIG. 2. Position of the prosthesis with respect to the distal pole of the scaphoid is measured as percentage subluxation by dividing the amount of prosthesis-scaphoid articulation in millimetres (c) by the width of the prosthesis (d).

Table 1

Characteristics of 25 Patients (30 Hands) Who Underwent Trapezial Silicone Rubber Arthroplasty

Characteristic	Sample characteristics
Age, yr, mean (and SD) and range	64 (11), 41-82
Sex, female:male, no.	21:4
Operated hand, no.	
Nondominant	18
Dominant	12
Bilateral	5
Diagnosis	Osteoarthritis
Time to follow-up, mo, mean (and SD)	78 (41)

SD = standard deviation.

Table 2

Subjective Results of Silicone Rubber Trapezial Arthroplasty in 25 Patients*

Variable	Mean	95% CI
Satisfaction	5.6	0.4-10
Pain	5.7	1.5-9.9
ROM	4.6	-0.6-9.8
Strength	2.2	-2.5-7.1
ADL	4.2	-0.7-9.1

*On a visual analogue scale, where -10 = completely worse, 0 = no change and +10 = completely better. ROM = range of movement, ADL = activities of daily living, CI = confidence interval.

of age (Fig. 3). A statistically significant greater improvement in strength, ADL and patient satisfaction ($p = 0.004$) was present in patients who were more than 60 years of age at the time of their operation. A similar trend toward greater improvement in patients more than 60 years old was observed in all other subjective categories.

Nine hands (30%) had tenderness or swelling at the base of the thumb. ROM of the wrist and thumb of the operated and nonoperated hands was not significantly different (Table 3). Forty-eight percent of patients had clinical instability of the prosthesis. Only 6 of these had tenderness or swelling at the base of the thumb. The prosthesis could be subluxated

in 9 patients and dislocated in 5. The average tip pinch was significantly weaker on the operated side compared with the nonoperated side ($p < 0.05$). A similar trend with non-significant differences was noted for grip strength and key pinch.

Compared to normative values, both hands performed poorly in standardized functional testing with the Jebsen's hand function and Purdue pegboard tests (Fig. 4). Functional deficits were most pronounced in the manipulation of large objects. Significantly ($p < 0.02$) more time was required for the operative hand to manipulate large objects compared with the unoperated side. This was most pronounced in patients with subluxation. However, patients

also had difficulty manipulating small objects compared to normative values on Jebsen's hand (56% greater time) and Purdue pegboard (71% fewer assemblies completed) tests.

Using the grading system described by Creighton and associates,⁷ 90% of the patients had radiographic lytic changes. Radiographic changes were seen in 64% of the metacarpals. All but 1 were grade C lytic changes (Fig. 5). Scaphoid changes were seen in 59% of patients, and 50% of these were grade 4 changes. Changes in other carpal bones were noted in 58% of patients. Pancarpal changes were found in 1 patient. Sixty-five percent of patients had greater than 20% radial displacement of the prosthesis. Dislocation was found in 10%. Prosthetic wear aver-

Table 3

Hand Strength and Thumb Range of Movement (ROM) in 25 Patients (30 Hands) Who Underwent Trapezial Arthroplasty

Physical measure	Operated side	Nonoperated side
Tip pinch strength, kg	3.3	4.5
Key pinch, kg	4.7	6.1
Grip strength, kg	18.2	22.3
Thumb extension ROM, °	39	45
Thumb abduction ROM, °	45	45
Wrist extension ROM, °	54	54
Wrist flexion ROM, °	52	54

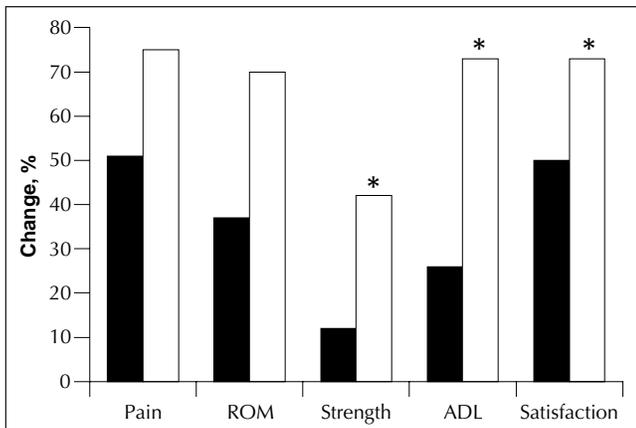


FIG. 3. The effect of age at the time of surgery. Subjective results in patients younger than 60 years (black columns) are compared with those of patients older than 60 years at the time of surgery (white columns) (* $p < 0.05$).

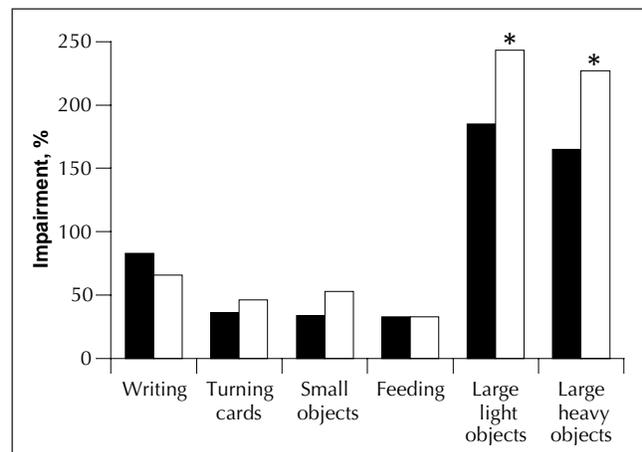


FIG. 4. Results of the Jebsen hand function test. This diagram shows the percentage impairment of function in nonoperated hands (black columns) compared with operated hands (white columns) with normal levels from age- and sex-matched patients in the subtests of writing, turning cards, handling small objects, feeding and manipulating large, light and large, heavy weights (*statistically different from the nonoperated hand, $p < 0.05$).

aged 15%, with a range of 0%–70%. Wear was found to be moderately correlated with radiographic lytic changes ($r = 0.52$). Three prostheses were fractured at the base of the thumb, and 1 of these was associated with a pathologic fracture of the scaphoid (Fig. 6).

One patient had reflex sympathetic dystrophy, which resolved after hand therapy. Six patients had their implant removed. Three were removed early after operation, 1 because of a staphylococcal infection, 1 for a symptomatic prosthetic dislocation and 1 for symptomatic silicone synovitis 5 months after insertion. Three symptomatic fractured prostheses were removed after 6, 9 and 10 years respectively. The patient with a 9-year follow-up also had a pathologic scaphoid fracture. This represents a 20% overall revision surgery rate (10% early, 10% late).

With the exception of the checkers subtest of Jebsen's hand function test, functional, radiographic and objective tests results were not significant predictors of patients' satisfac-

tion (Table 4). Longer follow-up was associated with a poorer outcome. There were high correlations among the 5 subjective ratings made by patients ($p < 0.01$).

Discussion

This study determined that patients with silicone rubber trapezial arthroplasty reviewed in long-term follow-up can be expected to have significant impairment and disability, which can be attributed to ongoing destructive disease as well as complications of silicone arthroplasty. These findings are in agreement with previous work. However, this study demonstrates that patients' perceptions of surgical success are not related to the severity of their impairment or to their complications. Patients' perception of surgical success must be related to factors not evaluated in this study. Others have found that factors related to efficient operation of the clinic are important predictors of patient satisfaction, at least in the short-term.²⁰

One consequence of the lack of correlation between patient satisfaction and physical symptomatology may be that patients with significant complications resulting from silicone synovitis might not request surgical re-evaluation. Since removal of the implant is advisable in cases of silicone synovitis to minimize continued pathologic bone destruction, physicians should be thinking about surveillance for the effects of silicone synovitis.

In this study, we found that 88% of patients reported some pain improvement following silicone trapezial arthroplasty. This would appear to be an excellent result and is comparable to results reported by others.^{1,2,4,6-13} Previous studies have tended to rely on examiner ratings, which most typically rate patients as improved or unimproved. Whereas 88% of our patients reported im-



FIG. 5. Posteroanterior view of a wrist with a Swanson HP silicone rubber trapezial implant 6 years after surgery. There are extensive lytic changes in the thumb metacarpal and the scaphoid. The prosthesis is severely worn and fractured.



FIG. 6. This radiograph demonstrates a fractured prosthesis and a pathologic scaphoid fracture in a patient 9 years after implantation. This patient presented with significant pain and tenderness at the base of the thumb.

provement in pain, the average improvement was only 5.7 out of 10, indicating that pain relief was quite incomplete. The fact that the overall percentage of patients reporting some pain relief was very high, whereas average pain improvement was moderate, illustrates the importance of standardized quantitative pain measures. Reliance on simple yes or no evaluations may not provide adequate insight into treatment response.

An inherent weakness of any follow-up study is the lack of consis-

tent quantitative measurement of preoperative status. Therefore, the subjective rating scale used in the present study required that subjects compare their follow-up status to their preoperative status and rate the overall change. Although one might question the patients' ability to accurately recall their preoperative status, patient perception of pain relief over time is an important concept in itself. Prospective studies are required to ensure unbiased information on pain relief. Future prospective outcome studies on thumb arthritis and its management should include a validated pain scale as a primary outcome measure.

Patient satisfaction correlated significantly with the extent of pain relief. Patient satisfaction reflects a variety of elements, including patients' perceptions of efficacy in relation to their needs and expectations, as well as nontreatment issues such as the pleasantness of the physical surroundings and support staff. The high correlation between subjective perceptions of change in physical status and pain, and overall patient satisfaction may be related to 2 issues. First, it reflects the importance of pain relief to the patient and supports the current practice of using pain as an indication for surgery. Second, retrospective assessments of change in physical status may be affected by overall patient satisfaction.

This study demonstrated better subjective results in patients over 60 years of age. Amadio and DeSilva⁶ also reported better subjective results in men more than 60 years of age. We found significantly greater "improvement" in patient-rated ADL in patients older than 60 years at the time of surgery. This supports the assumption that higher satisfaction in this older age group is related to lower physical demand.

Some authors^{1,2,8-10,12} have reported good functional results after silicone rubber trapezial arthroplasty. Most of these studies have not reported the results from standardized functional

testing. We found that patients reported an average improvement in their ability to perform their ADL of 43%. However, we also observed that patients had considerable objective functional deficits, and these tended to be worse on the operated side. Patients had marked difficulty manipulating objects that required wide abduction of the thumb on their operated side. This was a problem particularly in patients who had subluxation. Patients also had difficulties with tasks involving small objects and a significantly weaker tip pinch. There was no statistically significant correlation between the patient rating of improvement or overall satisfaction and these functional test results. This emphasizes the importance of not relying solely on self-report measures when judging the efficacy of surgical interventions.

This group of patients had poor function bilaterally, indicating that their disability was to a large extent a result of the arthritic process itself. It appears that many patients perceived the surgery as having had some positive effect on their functional ability, despite the similarity in impairment on their nonoperated hand and their ongoing functional limitations. The extent to which treatment alters patient function is difficult to ascertain in OA given the progressive bilateral nature of the disease process, which can vary between hands. Large prospective studies are required to determine if the course of deterioration is altered by surgical intervention.

Forty-eight percent of patients demonstrated clinical instability of the prosthesis. This is consistent with reports of up to 83% incidence of prosthetic instability. However, our study demonstrated that there was no significant correlation between the presence of instability and subjective, objective or radiologic results. The lack of correlation between patient ratings and objective findings suggests that one "outcome" cannot be predicted from the other.

Prosthetic wear and cold flow

Table 4

Predictors of Patient Satisfaction After Silicone Rubber Trapezial Arthroplasty

Predictor	Correlation with satisfaction (r)*
Patient characteristic	
Age	0.06
No. of hand problems	0.18
Length of follow-up	-0.38
Age at surgery	0.15
Objective measures	
Tip pinch strength	0.11
Key pinch strength	0.11
Grip strength	0.29
Thumb extension ROM	0.35
Thumb abduction ROM	0.19
Wrist extension ROM	-0.22
Wrist flexion ROM	0.28
Prosthetic position wear on x-ray	0.22
Prosthetic wear on x-ray	-0.30
Functional performance tests	
Jebsen hand function	
Writing	-0.30
Turning cards	-0.05
Handling small objects	-0.35
Feeding	-0.28
Checkers	-0.68
Manipulating large light objects	-0.02
Manipulating large heavy (1-lb) objects	-0.05
Purdue pegboard	
Pins assembled	-0.19
Bimanual assembly	-0.06
Pain	0.78
Movement	0.81
Strength	0.73
ADL ability	0.73

*Pearson correlation coefficient
ROM = range of motion. ADL = activities of daily living.

commonly occurs on the ulnar border of the prosthesis.¹⁰ We found an average of 15% prosthetic wear. Prosthetic wear was found to correlate moderately ($r = 0.52$) with radiographic cystic changes. Freeman and Honner⁸ also found a similar correlation. Although host response is unpredictable, it has been shown to be related to the load of microparticulate debris, which in turn is directly proportional to prosthetic wear.²¹

In the literature, lytic radiographic changes have been reported in 0–90% of patients.^{1,2,7–15,21–27} Several authors have reported that these changes are progressive.^{1,2,12,14,15,26} We found that 90% of our patients demonstrated radiographic evidence of silicone synovitis, with an average 6.5-year follow-up. Peimer and colleagues²¹ reported that silicone synovitis can result in pathologic fractures of carpus or trapezium. They suggested that these fractures were the end-stage of untreated particulate synovitis. In our series, one patient had a pathological scaphoid fracture. However, computed tomography demonstrated extensive cystic changes throughout the entire scaphoid and the other carpal bones, which were grossly underestimated on plain radiographs. This would tend to support the hypothesis of Peimer and colleagues.

In 1986, Pelligrini and Burton¹⁰ reported a 16% surgical revision rate at 3 years. More recently, Freeman and Honner⁸ reported late revisions in 7% of the patients reviewed. We had 3 (10%) early revisions and another 3 patients (10%) who required late revision, at an average follow-up of 8.3 years. One patient had a pathologic scaphoid fracture, and all 3 patients requiring late revision had a fractured prosthesis and postoperative histopathologic findings of silicone synovitis.

The life expectancy in a 60-year-old woman is 24 years and in a man is 19 years.²⁸ Therefore, we are concerned that the longer term usage required for even elderly patients

would result in significant impairments, which worsens with time. It is possible that over time a significant number of patients will suffer pathologic fractures, pancarpal disease or other complications requiring revision surgery. Perhaps owing to the recognition of complications with silicone rubber procedures, a number of alternative procedures have gained popularity. For example, at our centre, tendon interposition arthroplasty is most commonly performed. It should be noted that these newer procedures have not been subjected to large randomized trials or cohort studies, so only grade 3 and 4 level evidence exists to guide current surgical practice.²⁹

Conclusions

The natural history of OA of the trapeziometacarpal joint is progression toward pronounced functional difficulties as evidenced by the severity of deficits demonstrated in the non-operated hands of patients in this study. The findings of this study agree with those of other studies^{1,2,8,10,12} that report a high percentage of patients with pain improvement and satisfaction after silicone rubber trapezium arthroplasty. However, these findings may have overestimated the true extent of pain relief, owing to a lack of quantified objective measurements of pain. Whereas a high percentage of patients in this study experienced *some* relief, the *amount* of pain relief was not satisfactory.

Our study demonstrated that clinical, functional and radiographic abnormalities are common 6.5 years after operation. Quantitative patient ratings of outcome in terms of pain relief, movement, strength, ADL and overall satisfaction were not correlated with objective clinical or radiographic measures, indicating that patient perceptions of outcome provide an important, but different, perspective of outcome, one that can augment but not replace valid physical impairment measures. Although this study

showed superior subjective results in patients more than 60 years old, the value of this procedure when preferable options are available must be questioned. This opinion is based on the high incidence of revision surgery, the risk of pathologic fracture, the unknown true long-term results, the increasing life expectancy of our population²⁸ and the existence of alternative soft-tissue procedures,⁵ which have more stable outcomes and fewer long-term complications. A better understanding of surgical outcomes for advanced arthritis of the basal joint of the thumb requires, at least, a long-term prospective outcome study of more recently favoured procedures (i.e., tendon interpositional arthroplasty) and, ideally, randomized trials of alternative options.

Competing interests: None declared.

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LE PRIX MACLEAN-MUELLER

À l'attention des résidents et des directeurs des départements de chirurgie

Le *Journal canadien de chirurgie* offre chaque année un prix de 1000 \$ pour le meilleur manuscrit rédigé par un résident ou un fellow canadien d'un programme de spécialité qui n'a pas terminé sa formation ou n'a pas accepté de poste d'enseignant. Le manuscrit primé au cours d'une année civile sera publié dans un des premiers numéros (février ou avril) de l'année suivante et les autres manuscrits jugés publiables pourront paraître dans un numéro ultérieur du Journal.

Le résident devrait être le principal auteur du manuscrit, qui ne doit pas avoir été présenté ou publié ailleurs. Il faut le soumettre au *Journal canadien de chirurgie* au plus tard le 1^{er} octobre, à l'attention du Dr J.P. Waddell, corédacteur, *Journal canadien de chirurgie*, Division of Orthopaedic Surgery, St. Michael's Hospital, 30 Bond St., Toronto (Ontario) MTB 1W8.

