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Original Research

## Return to Sports and Recreational Activities Following Arthroplasty of the Basal Joint of the Thumb: A Retrospective Review



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**Purpose:** Arthroplasty of the basal, or carpometacarpal, joint of the thumb has been shown to decrease pain, improve strength, improve range of motion, and allow return to work. This study sought to assess whether basal joint arthroplasty also allows for a return to sports and recreational activities.

**Methods:** A survey assessing participation in sports and recreational activities, timing of return to play after surgery, enjoyment, and the presence of pain and limitations was mailed to patients who had undergone an arthroplasty of the basal joint of the thumb over a 3-year period.

**Results:** Of the 333 patients who underwent thumb carpometacarpal arthroplasty, met the criteria, and responded, 73% were able to successfully return to sports and recreational activities, with decreased pain and at the same or increased level of play, frequency of participation, and level of enjoyment for their sport or recreational activity. Patients were more likely to successfully return to sports and recreational activities if they had undergone surgery on their nondominant hand, did not stop their sport or recreational activity before surgery, were able to return within 9 months of surgery, and reported no post-operative limitations. Successful return to sports and recreational activities was not related to age, sex, surgeon, level of play, or the type of sport or recreational activity.

**Conclusions:** Most patients who replied to our survey reported successful return to sports and recreational activities after arthroplasty of the basal joint of the thumb.

**Type of study/level of evidence:** Prognostic IV.

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Arthritis of the basal, or carpometacarpal, joint of the thumb is a common cause of pain and disability. When nonoperative treatment fails, several different surgical treatment options exist for arthritis of the basal joint of the thumb, and no surgical treatment has demonstrated superiority over any other.<sup>1–4</sup> Based on a recent survey, the most commonly performed procedure for this condition is an arthroplasty of the basal joint of the thumb with trapezial excision, tendon transfer, and tendon interposition.<sup>5</sup> Arthroplasty of the basal joint of the thumb has been shown by multiple authors to reliably decrease pain, improve strength, and improve range of motion.<sup>6–12</sup> It has allowed patients to return to activities of daily

living and work, but does it also allow patients to return to sports and recreational activities?

Greater numbers of athletes are choosing to participate in sports and recreational activities into their senior years. The growing number of participants and enthusiasm for the National Senior Games Association and Senior Professional Golfers' Association tour are a testament to this fact. More than 10,000 athletes, who are 50 years or older, registered for the winter and summer National Senior Olympic Games in 2011. At least 25% of the golfers in the United States are 65 years or older.<sup>13</sup> Inability to participate in sports and recreational activities may be a motivating force for patients with arthritis to seek treatment and undergo arthroplasty procedures.<sup>14–17</sup> Therefore, patients frequently ask about their ability to return to sports and recreational activities after thumb carpometacarpal arthroplasty. Previous studies have documented high return rates to sports and recreational activities after other upper and lower extremity arthroplasty procedures,<sup>14,15,17–25</sup> but the ability of patients to return to sports and recreational activities after arthroplasty of the basal joint of the thumb has not been widely reported.

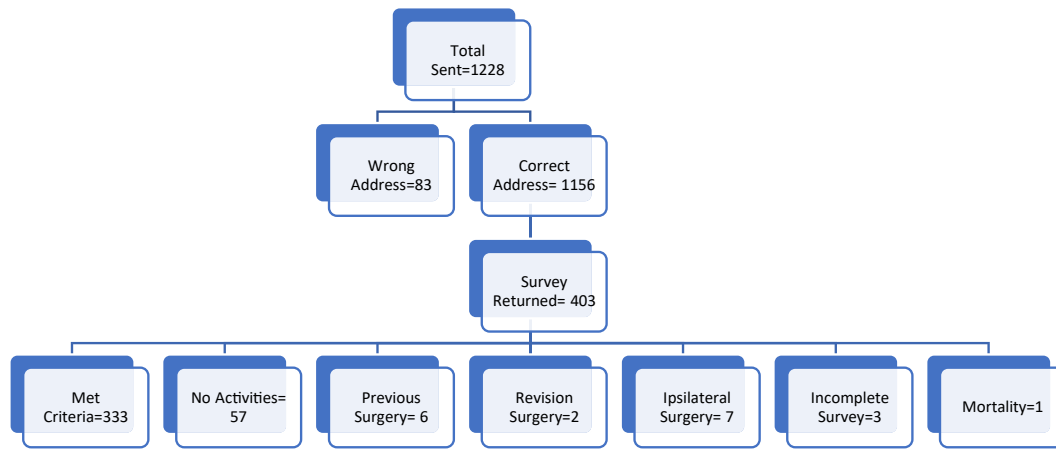
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**Figure 1.** Inclusion of patients in the study. Flowchart shows the total number of patients identified and the number of patients included. Three hundred and three patients were included in the study, 25% of the total patients identified. Of note, some patients were excluded for more than one reason.

To allow for better preoperative patient counseling, we sought to determine whether patients are able to return to sports and recreational activities after arthroplasty of the basal joint of the thumb. Our hypothesis was that most of the patients are able to successfully return to sports and recreational activities after surgery. Specifically, we hypothesize that patients will successfully return to sports and recreational activities with decreased pain and at the same or increased level of play, frequency of participation, and level of enjoyment for their sport or recreational activity.

## Materials and Methods

This study was approved by the Institutional Review Board. Written informed consent was obtained from all individual participants included in this study. Patients who had undergone an arthroplasty of the basal joint of the thumb performed by a hand fellowship-trained surgeon at our institution over a 3-year period were identified from a patient database.

Patients were included in the study if it had been more than a year since their surgery and they participated in sports and recreational activities before surgery. Patients were excluded from the study if they had undergone previous surgical treatment for arthritis of the basal joint of the ipsilateral thumb, had undergone a revision surgery in less than 1 year before completing the survey, had undergone additional major ipsilateral hand and/or wrist reconstructive surgery, and/or were unable or unwilling to complete the survey.

Patients included in this study had undergone an arthroplasty of the basal joint of the thumb performed by 1 of the 10 hand fellowship-trained surgeons at our institution. Although the surgical approach and techniques used by the 10 surgeons varied, all included complete trapezium excision, tendon transfer, and tendon interposition. The surgical approach and techniques used by the attending surgeons are similar to previously described techniques in the literature, including the suspension sling arthroplasty, the abductor pollicis longus suspensionplasty, and the ligament reconstruction tendon interposition.<sup>6–12</sup> After surgery, postoperative immobilization and rehabilitation programs were individualized based on the discretion of the attending physicians. Activity restrictions continued for up to 10–12 weeks after surgery.

Eligible patients were mailed a survey that detailed their participation in sports and recreational activities. The survey included questions about the length of involvement in their sports or recreational activities before surgery, the need to stop or limit sports and recreational activities, timing of return to play, level of

play, frequency of play, level of enjoyment of their sports and recreational activities, limitations to participation in their sports and recreational activities, level of pain, satisfaction with surgery, and other patient demographic and surgical information (see Appendix, available on the *Journal's* website at [www.jhsgo.org](http://www.jhsgo.org)). The survey also included a patient-reported outcomes questionnaire (the brief Michigan Hand Questionnaire [MHQ]).<sup>26</sup> The brief MHQ is a 12-question instrument scored from 0 to 100 with higher numbers representing better outcomes. The advantage of the brief MHQ is the shorter length, but the major disadvantage compared with the full MHQ is that it does not distinguish between hands. Additional information regarding patient demographics and surgery was derived from a chart review.

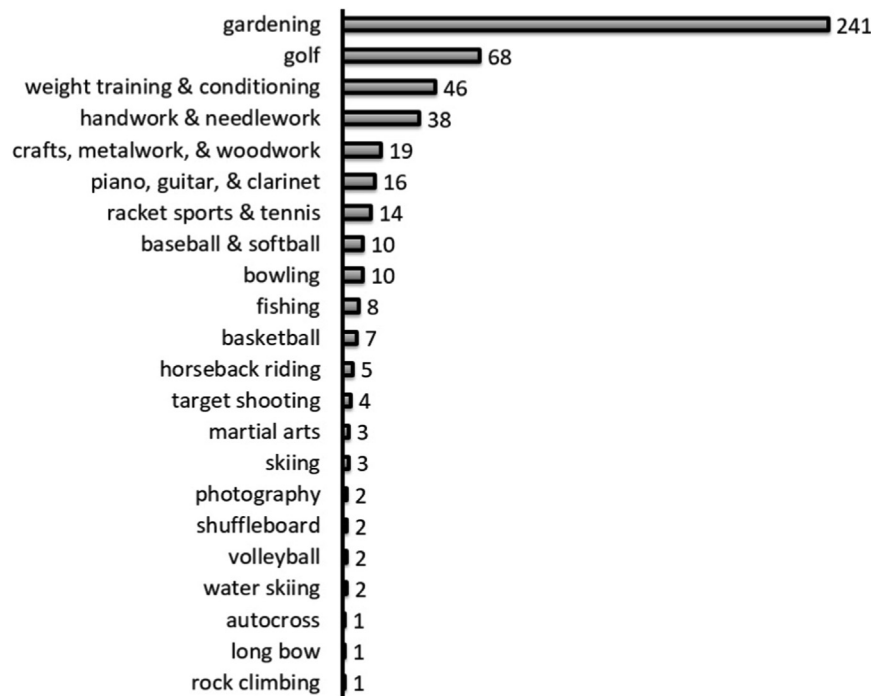
Successful return to sports and recreational activities was defined by patient responses to the survey questions using the following criteria: the same or increased level of play and/or frequency of participation, the same or increased level of enjoyment for their sport or recreational activity, and with decreased pain. These questions asked for recall back to 3, 6, 9, and 12 months after surgery, in addition to the time of survey completion.

Standard statistical analyses were performed to compare patients who were able to successfully return to sports and recreational activities with those who were not. Parametric testing was employed once the normal distribution of data was confirmed. A Student *t* test was performed for continuous variables, whereas Fisher exact tests and chi-squared analyses were performed for categorical variables. Significance was set at  $P < .05$ .

## Results

A total of 1,228 patients were identified, but 333 patient surveys were included in this study (Fig. 1). The average age of patients in this study was 64 years (range 40–83 years). In total, 80% of the patients were women. Demographic information between the respondents and nonrespondents was compared, and no significant differences were found between the cohorts. Arthroplasty of the basal joint of the thumb was performed on the dominant hand used for their sports or recreational activities in 83% of the patients. Although patients participated in various sports and recreational activities, the most common were gardening (80%), golf (22%), and weight training or conditioning (15%; Fig. 2).

More than half of the respondents (55%) participated in more than one sport or recreational activity. Most participated at the recreational level (89%), but this study did include patients who



**Figure 2.** Activity patterns of patients undergoing basal joint arthroplasty. Patients participated in a wide variety of sports and recreational activities requiring repetitive or strenuous use of their hands. More than half (55%) participated in more than one sport or recreational activity.

**Table 1**  
Return to Activity by Patient Characteristics

Patient Characteristics	Percentage of Patients Actively Participating in Activities	P Value
Dominant hand	69%	<.05
Non-dominant hand	85%	
Preoperative activity participation	80%	<.05
Preoperative activity discontinuation	64%	
Returned to activity 0–9 mo postoperatively	78%	<.05
Returned to activity >9 mo postoperatively or did not return	50%	
Postoperative limitations	26%	<.05
No postoperative limitations	76%	

The percentage of patients who successfully returned to sports and activity by patient characteristics.

participated in competitive leagues (7%), were semiprofessionals (1%), and were professionals (3%). In total, 86% of the respondents had participated in the activity for more than 10 years, and 61% had participated for more than 20 years before surgery. However, more than half (54%) ceased participating in their sports or recreational activities before surgery due to their symptoms.

Nearly all included patients (99%) were able to return to their sports or recreational activities in some capacity after surgery. Additionally, 86% resumed their sports and recreational activities in less than 6 months, reaching 82% at 9 months. Postoperative level of play stayed the same or increased in 77% of the patients, whereas the frequency of participation stayed the same or increased in 80% of the patients. Level of enjoyment for their sports or recreational activities stayed the same or increased in 90% of the patients. After surgery, 71% of the patients reported no pain, whereas pain decreased in nearly all patients (97%).

Patients in this study reported high levels of satisfaction after surgery. After surgery, 91% were satisfied or very satisfied with the

procedure. In addition, patient-reported outcomes scores were high; the average brief MHQ scores of respondents were  $85 \pm 17$ .

Although nearly all patients were able to return to sports and recreational activities in some capacity, successful return to play was defined by a combination of the previously reported results. A successful return to play, including the same or increased playing time, enjoyment, and level of play along with decreased pain, was achieved in 73% of the patients.

Patients were more likely to successfully return to sports and recreational activities if they had undergone surgery on their nondominant hand for sports and recreational activities (85% vs 69%,  $P = .027$ ), did not stop their sports or recreational activities before surgery (80% vs 64%,  $P = .003$ ), were able to resume their sports or recreational activities within 9 months of surgery (78% vs 50%,  $P < .001$ ), and reported no postoperative limitations (83% vs 38%,  $P < .001$ ; Table 1). The patients with a successful return to sports and activities also reported higher levels of satisfaction (76% satisfied vs 26%,  $P < .001$ ) and brief MHQ scores ( $90 \pm 12$  vs  $73 \pm 19$ ,  $P < .001$ ). On further evaluation, successful return to sports and recreational activities was not correlated to age, sex, surgeon, level of play, or the type of sport or recreational activity.

Less than one-fourth of the patients (24%) were limited during participation in their sports or recreational activities by pain, weakness, or stiffness. By contrast, half of the patients in this study (50%) had other medical limitations that affected their participation in sports and recreational activities. These patients stated that they were limited by their age, pain, arthritis in other joints, spinal stenosis and degenerative disc disease, fibromyalgia, coronary artery disease, multiple sclerosis, cancer, and other upper extremity and lower extremity arthroplasties. In addition, 9% of the patients who had undergone a unilateral arthroplasty of the basal joint of their thumb were limited by arthritis of the basal joint of the thumb in their opposite hand. However, 39% of the patients used various modalities of pain relief during their sports or recreational activities, including braces and gloves (14%), ice or heat (12%), and medications (23%). These patients were able to participate in their activities but

required various treatment modalities to help with discomfort during or after activity participation.

## Discussion

This study found that most patients (73%) were able to successfully return to sports and recreational activities after basal joint arthroplasty of the thumb. Patients were more likely to successfully return to sports and recreational activities if they had undergone surgery on their nondominant hand for sports and recreational activities, did not stop their sports or recreational activities before surgery, were able to resume their sports or recreational activities within 9 months of surgery, and reported no postoperative limitations. Successful return to sports and recreational activities was not related to age, sex, surgeon, level of play, or the type of sport or recreational activity. Knowledge of these factors will allow for better preoperative counseling regarding return to activity.

More than half of the patients who responded to the survey (54%) needed to cease participation in their sports or recreational activities before surgery because of their arthritis at the base of the thumb. Most of these patients (64%) were able to successfully return to sports and recreational activities postoperatively. Using our definition of successful return, a successful return to activity in patients who had ceased their activities preoperatively is defined as participation in activities at an increased rate with less pain and more enjoyment than their average participation after surgery. However, our data indicated that patients who were inactive after surgery were less likely to successfully return to sports and recreational activities after arthroplasty of the basal joint of their thumb. These patients may have been more deconditioned or may have had more severe disease after surgery. This also correlates with a shorter return to work time in patients who did not take time off of work due to their symptoms before basal joint arthroplasty.<sup>27</sup>

Several limitations to this study exist. First, a potential exists for patient recall bias due to the length of time between survey administration and return to sport. In an effort to minimize this, patients were asked to recall their time to return to sport at 3-month intervals after surgery so that patients would be able to associate their activities with the seasons. The high rate of nonresponders also presents a concern for bias. The 33% rate of return of surveys poses the risk of response bias, particularly if those who opted to not complete the survey had a lower or higher rate of return. The similarity of demographics between those who did and did not complete the survey helps to ameliorate this risk, although by no means completely erases it. The inclusion of patients undergoing various tendon interposition procedures increases the generalizability to a wide variety of patients presenting with thumb arthritis. Previous comparative studies have not demonstrated superiority of any of the surgical techniques for arthroplasty of the basal joint of the thumb.<sup>1–4</sup> In addition, the heterogeneity of the cohort may make this study more applicable to the general population.

This study evaluated patients with less than 5 years after arthroplasty of the basal joint of the thumb. The high rate of return to sports and recreational activities found in this study may not be maintained with longer-term follow-ups. Many arthroplasty surgeons are concerned that continued participation in high-demand or high-intensity sports and recreational activities may increase wear and revision rates after other upper and lower extremity arthroplasties.<sup>16</sup> Although arthroplasty of the basal joint of the thumb, performed with trapezial excision, tendon transfer, and tendon interposition, is not subject to polyethylene wear, repetitive loads could lead to subsidence, instability, and failure. The effect of long-term participation in sports and recreational activities on arthroplasty of the basal joint of the thumb is unknown.

The results of this study may help guide patient expectations after arthroplasty of the basal joint of the thumb, although our response rate likely introduces bias. We counsel patients that most of them can successfully return to sports and recreational activities after surgery. However, additional studies are needed to determine whether the high return rates documented in this study are sustained over time.

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