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## [ Orthopaedic Surgery ]

# Shoulder Arthroplasty: Return to Sport

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**Context:** Increasingly, total shoulder arthroplasty is being performed not only to treat the pain associated with glenohumeral arthritis but also to return patients to the level of activity and function they enjoyed prior to the development of arthritis. While return to sport and activity have been studied in the total knee and total hip replacement literature, it is only relatively recently that the same focus has been placed on total shoulder replacements.

**Evidence Acquisition:** PubMed database from the years 2000 to 2014. All studies relevant to shoulder arthroplasty and return to sport were included in the review.

**Study Design:** Clinical review.

**Level of Evidence:** Level 4.

**Results:** An increasing number of patients seeking total shoulder arthroplasty are doing so with the expectation of not only decreased symptoms of glenohumeral arthritis but also of return to a high level of activity. The majority of patients are able to return to their prior level of activity within 6 months of surgery. In some series, patients saw an improvement in their ability to perform their chosen activity.

**Conclusion:** Patients should be counseled that there is a high probability that they will be able to return to their preoperative activity level after total shoulder arthroplasty and, in some cases, see an improvement in their abilities to participate in sport.

**Strength-of-Recommendation Taxonomy (SORT):** C.

**Keywords:** total shoulder arthroplasty; shoulder replacement; athlete; return to sport

Shoulder replacement surgery is done for a variety of reasons. One of the most common indications is the reduction of pain in cases of advanced arthritis.<sup>2</sup> In addition to the goal of pain reduction, most surgeons also try to achieve restoration of shoulder function and increase the patient's quality of life.<sup>5,7</sup> Increasingly, these activities are being broadened to not only include activities of daily living, such as dressing oneself or being able to participate in household chores, but also to include sporting activities such as golfing, swimming, and dancing.

Additionally, given the historically good results of total shoulder arthroplasty (TSA), patients have come to have increasingly higher expectations of their function postoperatively. It is common, both during preoperative and follow-up visits, for patients to ask the surgeon what kinds of sports they will be able to do or allowed to participate in after

TSA.<sup>7</sup> Specifically, they wonder whether they will be allowed to participate in the activities they enjoyed prior to developing shoulder problems and at what level they will be able to participate. This clinical review examines how return to sport has been studied and reported on in the shoulder arthroplasty literature.<sup>3,5-8</sup>

## RETURN TO SPORT AFTER TOTAL SHOULDER ARTHROPLASTY

McCarty et al<sup>5</sup> reported on 75 patients (86 total shoulder replacements) at an average follow-up of 3.7 years. In their series, the study population received an older-generation biomodular implant (Biomet), and several patients received a hemiarthroplasty. Sixty-four percent of patients reported that return to sport was one of the reasons that they underwent TSA;

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50% of patients were able to increase their participation postoperatively, and 71% showed an improvement in their ability to play sport. In their study, golfing and tennis were the most popular sports and had the most favorable return after TSA. Swimming was also popular and showed favorable return. A return to softball was least favorable, with only 2 of 10 patients able to return postoperatively. Most patients were able to partially return to sport at 3.6 months and make a full return by 5.8 months after surgery.<sup>5</sup>

Zarkadas et al<sup>8</sup> used a mailed questionnaire to investigate patient-reported activity after both TSA and hemiarthroplasty. Specific to the TSA group, 52 patients completed the survey, and 27 of 52 patients reported having high-demand use of their operative shoulder. The most frequently cited low-demand sporting activities were stationary biking, treadmill use, and horseshoes. Medium-demand activities included fishing, dancing, and swimming. The high-demand sporting activities that patients reported being able to return to included road biking, free weights, and hunting/shooting.

Schumann et al<sup>7</sup> examined 100 patients with unilateral TSA followed for a minimum of 1 year. They mailed patients a postoperative questionnaire that the authors developed to investigate postoperative sports participation. Of the patients surveyed, 55 participated in sports prior to undergoing TSA, and 49 patients (89%) were able to continue playing sports at a mean 3 years' follow-up. Seventeen patients who had previously participated in sports prior to developing shoulder pathology had given up playing sports because of their disability; 11 of these patients were able to go back to sport after TSA. None of the patients who underwent TSA and were active in sports activities stopped participating after having surgery. The most commonly reported sporting activities in this series were swimming (20.4%), golfing (16.3%), cycling (16.3%), and fitness training (16.3%). It should be noted that 18 of 55 patients in this series reported sporting restrictions due to shoulder problems even after TSA.

Schmidt-Wiethoff et al<sup>6</sup> showed that 62 of 74 patients (84%) were able to return to sport after TSA. The other 12 patients gave up sport entirely. Nineteen of the 62 who continued to play had limitations of their sporting activity. Unfortunately, the article did not give exact details regarding the limitations or what the authors believed to be the reason.

## **SURGEON OPINION REGARDING RETURN TO SPORT AFTER TOTAL SHOULDER ARTHROPLASTY**

With regard to surgeon expectations and preferences, several studies have investigated what the opinion of experienced shoulder surgeons is regarding return to sports after TSA.<sup>1,2,4</sup> Golant et al<sup>1</sup> distributed a survey to 310 members of the American Shoulder and Elbows Surgeons (ASES) inquiring into what types of activities they allow their patients to participate in after 5 types of shoulder arthroplasty. Looking specifically at

TSA, 59.1% of surgeons responded that they would allow their patients to participate in low-impact sports without restrictions, 19.6% high-impact sports, and 8.2% contact sports; 27.5% said that they would allow low-impact sports with limitations, 39.7% high-impact sports with limitations, and 18.5% contact sports with limitations. With sufficient experience, 7.8% would allow low-impact activities, 16.8% high-impact sports, and 18.7% contact sports. The authors concluded that the majority of ASES surgeons would allow some return to sport after TSA. As might be expected, surgeons were more likely to allow return to sport if the sport did not involve significant contact, application of high loads to the upper extremity, or risk of fall or collision.

Magnussen et al<sup>4</sup> also submitted a survey to the surgeons within the ASES as well as the surgeons in the European Society for Surgery of the Shoulder and Elbow. The survey contained 37 activities and asked surgeons to classify their postoperative recommendation for each activity. The authors found that almost all surgeons allowed their patients to resume noncontact activities such as stationary bicycle, elliptical trainer, hiking, and low-impact aerobics. Sports with increased use of the upper extremity varied in terms of response. Eighty-one percent of surgeons stated they would allow patients to swim after undergoing TSA, 93% golf, 65% rowing, and 67% bowling. High-impact shoulder activities and those with a greater risk of contact were much less likely to be allowed. Fifty-eight percent of surgeons stated that they would not allow their patients to participate in lacrosse, 83% American football, 49% martial arts, and 39% waterskiing. Interestingly, 80% of European surgeons stated that they would not allow weight lifting, while only 29% of American surgeons stated that they would disallow it.

In preparing their article, Healey et al<sup>2</sup> surveyed 35 surgeons in the ASES as to their recommendations for athletics and sports participation after TSA. As expected, low-impact activities such as swimming, doubles tennis, bowling, and dancing were recommended and allowed. Those activities that were allowed with experience were golf, ice skating, shooting, and downhill skiing. Those activities that were not recommended included football, gymnastics, hockey, and rock climbing.

## **CONCLUSION**

Patients undergoing TSA for primary glenohumeral arthritis often report return to activity/sport as one motivation for having the operation. The majority of patients can expect to return to their preoperative level of activity within 6 months postoperatively. Many patients will see an improvement in their ability to participate after surgery.

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