Golf After Total Hip Arthroplasty: A Retrospective Review of 46 Patients

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Context: With the rising number of patients with total hip arthroplasty, there is demand for sporting activities for these patients to stay physically active. Objectives: The goal of this study was to evaluate satisfaction and golfing performance for golfers after total hip arthroplasty. Study Design: Retrospective cohort study. Patients: Data of 46 golfers with an average age of 66.5 years (46–79 years) with an average follow up of 58.8 months (7–253 months) after total hip arthroplasty was analysed. Results: 37 patients (80.4%) were able to return completely pain free, 9 patients still had pain during golf (19.6%). While satisfaction was high regardless of gender or affected side, only male golfers significantly improved their handicap and driving distance. Time spent on the golf course was the same pre- and postoperatively. Average time for returning to practice was 3.8 months; time until a full round of golf was 5.2 months. Postoperative physiotherapy was a significant factor in achieving an improved performance postoperatively. Conclusions: Golfers can return to the golf course with the same frequency and performance level to stay physically active after total hip arthroplasty. Key Words: golf, sports injuries, total joint replacement, hip

Its ever growing popularity has put the sport of golf into the focus of sports medicine researchers over recent years. Literature on golf injuries in the past has not focused on the lower extremity for an obvious reason. Epidemiologic studies on golf injuries agree that most injuries occurred in the spine and the upper extremity.1-4 The number of lower extremity injuries and overuse syndromes was below 10% in all of the above mentioned studies.

In contrast, total joint replacement is far more common on the lower extremity. Osteoarthritis of the hip and knee has become a major concern in Germany with average age and life expectancy projected to increase in years to come. Total hip arthroplasty provides effective treatment for osteoarthritis of the hip. It not only provides pain relief but also helps the patient to reach or even improve his or her preoperative activity level. Quite a number of publications on physical activity after total joint replacement can be found in the literature.5-8 Their results emphasize the positive effect of physical activity on outcome and patient satisfaction. This means

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there is demand for sporting activities that can be safely performed by patients after total joint replacement.

The sport of golf has enjoyed increasing popularity in Germany over recent years. The fast rising number of active golfers and golf courses in the past decade underline this trend. While golf has become more popular in a younger age population, there is still a higher percentage of older participants in comparison with other sports. In 2004, 40.3% of German golfers were over 55 years of age.

Generally, golf is considered a low risk sport that allows people to stay physically active up to an advanced age, an age in which total hip arthroplasty is common; however, there is a lack of data focusing on golf after total joint replacement. Therefore we feel it is important to examine the effects of total hip replacement in active golfers.

The goal of this study was to find out how hip joint replacement affected the patient’s ability to play golf and how long it took the patients to return to the golf after the operation. This information should help clinical sports medicine practitioners to keep their patients physically active after total joint replacement operations.

Methods

Study Design
A ten-page questionnaire was mailed randomly to golf clubs in Germany to identify golfers with total hip arthroplasty. This way, we collected a random sample of 46 patients, who had primary total hip arthroplasty for osteoarthritis. Exclusion criteria were traumatic aetiology, multiple surgeries, and limited golf experience of less than 2 years before surgery. The questionnaire consisted of three parts. The first part characterized the golfers by age, sex, height, weight, handedness, golfing experience, and handicap. The second part included questions concerning the operation(s) and postoperative rehabilitation. Golfers were asked to name the affected joint, the date of the operation, time spent in the hospital, and the amount of time spent on rehabilitation and physiotherapy. Postoperative complications like persistent pain, instability, infection with possible revision surgery were also considered. The third part of the questionnaire dealt with the patients golfing performance before and after the operation. Pain during golf, handicap, driving distance, and amount of time spent on the golf course were evaluated pre- and postoperatively.

Study Population
In total, we reviewed 46 amateur golfers: 31 men (73.2%) and 15 women (26.8%) with total hip arthroplasty. The average age in our cohort was 66.5 years (range: 46–79 years), and average preoperative golf experience was 13 years (range 2–46 years). The average handicap of our study group at the time of our survey was 25.0 (range 5-54). There was a total of 62 total hip arthroplasties evaluated in this study as 16 patients had bilateral surgery. The average follow up after their primary operation was 58.8 months +/- 54.2 (Range 7–253 months). See Table 1 for patients’ demographics.
Statistical Methods

Statistical analysis was performed using the SPSS 11.0 Software. We performed analysis of qualitative variables using chi-squared test (Pearson) and quantitative variables using the Mann-Whitney U-test and Student's t-test. Values of $P < 0.05$ were considered significant.

Results

Golfing Activity

Pre- and postoperative golfing activity was evaluated by the number of times the patients played golf during a week. Most patients were able to return to their preoperative activity level. It has to be noted that golfers with low activity levels who played under two times a week were able to play at least twice a week after
surgery. Those five golfers who had to reduce their activity level because of pain were significantly more active preoperatively (4.8 times per week vs. 2.5 times per week). Four of those five golfers played less because of pain. One golfer played less for reasons unrelated to the surgery. Overall the amount of golf after surgery was found to be between two and three times a week regardless of preoperative activity level or affected joint (Table 2).

**Golfing Performance**

As parameters of golfing performance, handicap and driving distance were evaluated. The average preoperative handicap in our study group was 27.3 +/- 11.4. Overall we found a significant improvement of the average handicap to 24.5 +/- 9.7 after the operation ($P = 0.002$). The average preoperative driving distance was improved significantly from 169.8 meters preoperatively to 176.6 meters postoperatively ($P = 0.028$).

**Return to the Golf Course**

The average time for the patients to return to playing golf was 3.8 months; the time it took them to play a full round (18 holes) of golf was 5.2 months. Overall, in 51.6% of cases (32 of 62 operations) the patient had returned to the golf course within three months after surgery. After 6 months, all but three of the patients (4.8%) were playing golf again.

We asked the patients to subjectively evaluate their timing for returning to golf. Overall, only one patient (2.2%) who started playing golf three months after total hip arthroplasty felt she should have waited longer. Twelve patients (26.1%) felt they could have returned sooner but did not on the advice of their doctors. The other patients (n = 33, 71.7%) felt they had returned to the golf course at the right time.

**Postoperative Pain**

At the time of our survey, 37 patients (80.4%) were completely pain free on the golf course. Nine patients experienced pain, 4 of them during the golf swing (8.7%) the other 5 only had problems while walking longer distances (10.9%). When comparing the two groups, the patients with pain played significantly less golf per week

| Table 2  Development of Golfing Activity Before and After Total Hip Arthroplasty |
|-----------------|-----------------|-----------------|
|                | Preoperative    | Postoperative   |
| 30 unchanged   | 2, 8 x /week    | 2, 8 x /week    |
| 11 played more | 1, 6 x /week    | 2, 7 x /week    |
| 5 played less  | 4, 8 x /week    | 2, 9 x /week    |
(2.2 times vs. 2.9 times; \( P = 0.046 \)) and took more time to return to a full round of golf (7.8 months vs. 4.7 months; \( P = 0.012 \)).

**Gender Differences**

When analyzing golfing performance, we observed significant gender differences. Pre- and postoperatively, male golfers had better handicaps and driving distances. Male golfers were able to improve their average driving distance from 174.7 meters to 181.2 meters (\( p = 0.046 \)) while for female golfers maximum driving distance decreased from 154.5 meters before to 154.0 meters after surgery. Also handicap was significantly improved only for male golfers from 25.1 to 22.2 (\( P = 0.004 \)). For female golfers, handicap improvement from 33.9 to 31.4 did not reach statistical significance (\( P = 0.176 \)).

Female golfers took more time to return to the golf course than did male golfers. Women with total hip arthroplasty returned to the golf course after an average of 4.5 months, which was significantly longer (\( P = 0.001 \)) than their male counterparts, who took 3.5 months to return (Figure 1). Five female golfers (33.3\%) felt they could have returned sooner. This was true for 20.0\% of the male population questioned. No significant gender difference was observed in our study group regarding the likelihood of experiencing postoperative pain during golf (\( P = 0.846 \)).

**Affected Side**

Of our 46 patients, 16 (34.8\%) had total hip arthroplasty performed bilaterally. Those patients did not show significant differences concerning postoperative playing level, driving distance, and pain compared to patients with unilateral arthroplasty. Of the 30 patients with unilateral joint replacement, no significant difference was noted between the left (\( n = 16 \)) and the right leg (\( n = 14 \); Table 3). Since all patients played golf right-handed this means there was also no difference between leading and trailing leg.

![Figure 1](image) — Time of return to the golf course after total hip arthroplasty for male and female golfers (includes 16 patients with bilateral operation; \( N = 62 \))
Rehabilitation

Analysis of the rehabilitation procedures revealed that 37 patients (80.4%) were transferred from the hospital to a rehabilitation institution where they stayed an average of 19.2 days. This did not have a significant influence on the postoperative result regarding golf performance or earlier return to the golf course; however, patients who stopped regular physiotherapy after being released from the rehabilitation institution were significantly less likely to improve their driving distance and their handicap. For these patients, driving distance decreased from 181.4 to 179.6 meters, while their handicap improved by 1.4 strokes from 23.8 to 22.4. This stands in contrast to those patients who either continued physiotherapy after the rehabilitation hospital or those who did physiotherapy on an outpatient basis altogether. This group was able to significantly improve driving distance from 165.7 to 174.7 meters and their handicap by 3.2 strokes from 28.3 to 25.1 (Figure 2).

Complications

In our study population of 46 patients, a total of 62 total hip replacements were performed. Three patients had to undergo revision surgery (4.8%). In these cases, revision was not due to mechanical problems but to postoperative infection in all cases. None of the patients had started playing golf at the time of the infection. The patients were revised at 10, 12, and 24 days postoperatively without further complication. The patients returned to the golf course at 6, 3, and 5 months, respectively. One other patient suffered from a deep vein thrombosis in the postoperative
hospital stay. The hospital stay was extended to 21 days and the patient returned to the golf course after 2 months. Overall we found no case of revision surgery after the patients started playing golf again.

**Satisfaction**

Patient satisfaction was evaluated by asking whether golf after the operation was more, less, or as much enjoyable as before. Only one patient (2.2%) stated that golf

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**Figure 2a**—Driving distance comparing patients with and without postoperative physiotherapy.

**Figure 2b**—Handicap comparing patients with and without postoperative physiotherapy.
was less fun after total hip arthroplasty. Almost half the patients (n = 22; 47.8%) enjoyed golf even more after the operation. Twenty-three patients (50.0%) enjoyed golf as much as they did preoperatively.

**Comments**

There are a limited number of studies that evaluate sporting activity after total joint arthroplasty. Dubs et al found that 86 (78%) of their 110 patients participated in sports before total hip arthroplasty and that 71% of them were able to return to their sport.11

In most of these studies, there is distinction between low and high impact activities with golf being considered a low impact activity. Studies that have evaluated golfers among others almost unanimously found golf to be a sport that can be safely recommended after total hip replacement. In a review article by Healy et al, members of The Hip Society were questioned on their recommendations regarding sporting activity after total hip or knee arthroplasty. It was stated that golf belonged among the sporting activities that could safely be recommended.12 Kilgus et al evaluated a large number of hip arthroplasty patients and included golf among the recommended sporting activities for patients after total hip arthroplasty.13 Ritter et al, in their study, found that golf did not have a negative influence on the outcome of a total hip arthroplasty.14

The only study that reported contrasting results concerning golf after total hip arthroplasty was recently published Chatterji et al. In their results, golf was together with tennis and jogging as three sports that had a significantly high number of drop outs (13 of 19 patients) postoperatively15 and was therefore not recommended after total hip arthroplasty.

Very few studies on physical activity after total joint replacement are sport specific. Mont and co-workers analyzed functional abilities and satisfaction of tennis players after total hip and total knee arthroplasty, respectively. They found a low failure rate and a high degree of satisfaction in competitive tennis players who all were members of the United States Tennis Association.16,17

So far, Mallon and Callaghan have published the only study that evaluates results of total hip and knee arthroplasty in golfers.18,19 They were able to study a large number of golfers with hip arthroplasty (n = 115) with average age (67.1 years) and follow up (6.1 years) comparable to our study. A slight increase of handicap (1.1 strokes) was found postoperatively in Mallon’s group. Driving distance increased by 3.3 yards for hip arthroplasty patients. Our results show a lowering of the golfer’s handicap (2.8 strokes) and improvement in driving distance (6.8 meters). When comparing Mallon’s results to ours, one has to keep in mind that different from golf in North America, the use of motorized golf carts is not common in Germany. Not using a golf cart results in walking approximately 10 kilometers in 4 to 5 hours to complete 18 holes of golf. In both studies, the majority of patients was satisfied with the outcome of the procedure and was able to play golf again without pain.

Patients in Germany can be transferred to a rehabilitation hospital for intensive physiotherapy for the duration of 2-3 weeks. This is paid for by their insurance. In our study, 80% of our patients did go to such an institution. The other 20% did
undergo physiotherapy on an outpatient basis. A significant finding of our study is that patients who stopped physiotherapy after being released from the rehabilitation hospital were not able to significantly improve their golfing performance. This meant that this group had physiotherapy for not more than 3 weeks. In contrast, those patients who either continued physiotherapy after the rehabilitation hospital or those who did physiotherapy on an outpatient basis altogether performed significantly better when they returned to the golf course.

Gender differences are rarely discussed in the above mentioned literature. In our study population, there was a significant improvement in golfing performance only for male golfers. This had no influence on golfing activity and overall satisfaction, however. It was interesting to see that women were slower in returning to the golf course. The reason for this seems to be a more careful approach of the treating doctor, because one third of the women felt they could have returned sooner but did not on the advice of their doctor.

The question whether sporting activity in general or golf in particular have an influence on revision rate or promote early loosening is difficult to answer. We found no revision case in our group after an average follow up of 4.9 years. We realize that a longer follow up preferably with a control group of non golfers is needed to more sufficiently comment on the problem of loosening or revision surgery after primary hip arthroplasty. This has also been noted by Mallon et al in their study on golf after total hip arthroplasty. Other studies have commented on this subject. Dubs et al found a higher number of revision cases in patients who were not involved in sports (14% compared to 1%). Kilgus et al found that more active patients had a higher revision rate (28%) than did less active patients (6%).

We realize limitations of our study that come with its design. To be able to recruit a high number of patients, we designed this study as retrospective mail in study without a control group. This design implies some major selection bias. It could be suggested that nonresponders were less satisfied. We tried to form a homogenous group by using strict inclusion criteria; however, it has to be conceded that our study group includes a wide range of postoperative follow up. From a selected sample like this, no conclusion can be made about the general safety of returning to golf after total hip arthroplasty, because patients who were not able to return to golf after the operation would have been unlikely to participate in this study. Long term prospective clinical and radiological studies of golfers undergoing total hip arthroplasty are needed to answer those questions. Still, our results offer encouragement for golfers with total hip arthroplasty. In summary, all patients in our study group were able to return to the golf course with at least equal satisfaction in all but one case.

References


