Activity after Total Hip Arthroplasty

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A large proportion of patients under 40 years of age who underwent Total Hip Arthroplasty (THA) increased their physical activity. Eighty-six percent of the patients were highly active, with a UCLA score ≥ 7. Furthermore, the reported MCID, SCB, and PASS for mHHS were achieved by more than 80% of patients

sports activity | young patients | THA | MCID | PASS | SCB

1. Background

The management of degenerative hip diseases in young patients remains a challenge. Current conditions, such as femoroacetabular impingement syndrome (FAIS), developmental dysplasia of the hip (DDH), and trauma are extensively recognized as sources of pain and functional limitations in active individuals that precede the development of hip osteoarthritis [1][2][3][4][5][6][7]. In the past several years, there has been a rapid increase in the development of surgical techniques to preserve native hip joints, with the appreciation that most hip problems in young adults are associated with altered hip morphology [1][8]. Despite the improvement of both open and arthroscopic hip-preservation procedures, these procedures may not provide adequate symptom relief in the case of severe osteoarthritic changes, and total hip arthroplasty (THA) may be required [8][9][10]. These cases are often especially challenging due to deformity, muscle wasting, and scarring from previous surgeries [11][12]. THA offers young patients the opportunity to achieve excellent pain relief levels and enhanced function. However, young patients undergoing THA often have high expectations concerning their postoperative level of activity [10][13][14]. A systematic review on the functional outcomes after THA among patients under 30 years has been conducted [10]. However, there is a lack of data answering questions about functional outcomes and sports activity levels after THA in young patients.

2. Demographics

Thirty-six patients (40 hips) were included in the analysis. The mean age was 31.5 ± 5 (19–39) years, the mean body index (BMI) was 27.1 ± 5.3 (17.3–43.8) kg/m^2, the mean duration of surgery was 73.5 ± 25.5 (45–141) minutes, the mean duration of the symptoms prior to surgery was 4.8 ± 4.4 (0.5–23) years, and the mean follow-up was 3.9 ± 1.3 (2–9.5) years. Surgery was performed on 23 men and 13 women. The diagnoses leading to arthroplasty were secondary osteoarthrosis due to FAIS in 6 hips, DDH in 19 hips, trauma in 10 hips, and avascular necrosis of the femoral head (AVN) in 5 hips. Twenty THAs were performed on the right side, and twenty were performed on the left side (**Table 1**).

Table 1. Patient demographic data.

	Value
Total no. of patients	36
Laterality, *n* (%)	
Right	20 (50%)
Left	20 (50%)
Sex, *n* (%)	
Female	13 (36%)
Male	23 (64%)
Age, years	31.5 ± 5 (19–39)
Body mass index, kg/m^2	27.1 ± 5.3 (17.3–43.8)
Follow-up, years	3.9 ± 1.3 (2–9.5)
Preoperative-diagnoses, *n* (%)	
FAIS	6 (15%)
DDH	19 (47.5%)
Trauma	10 (25%)
Avascular necrosis of the femoral head	5 (12.5%)

At the latest follow-up, there was no revision surgery. However, two patients presented a leg length difference of 1 cm.

3. Sports and Recreational Activity

Complete questionnaire data regarding recreational activity were available for 36 patients. After surgery, 33 of 36 patients (92%) were active in at least one recreational activity, compared to 16 of 36 (44%) before the onset of first symptoms. Most of the patients who were inactive started new sports and recreational activities postoperatively. Patients engaged in an average of four different sport disciplines at the last follow-up, which differed significantly from the number of sport disciplines practiced before the onset of the first symptoms (1.8 disciplines; $p < 0.0001$). This increase was confirmed in the individual analyses of men and women. In the comparison between men and women within the groups, there was no difference in the practiced sports disciplines before onset of the first symptoms and after THA (prior: 2.1 to 1.4; $p = 0.103$; after: 4.3 to 3.7; $p = 0.525$) (**Figure 2**).

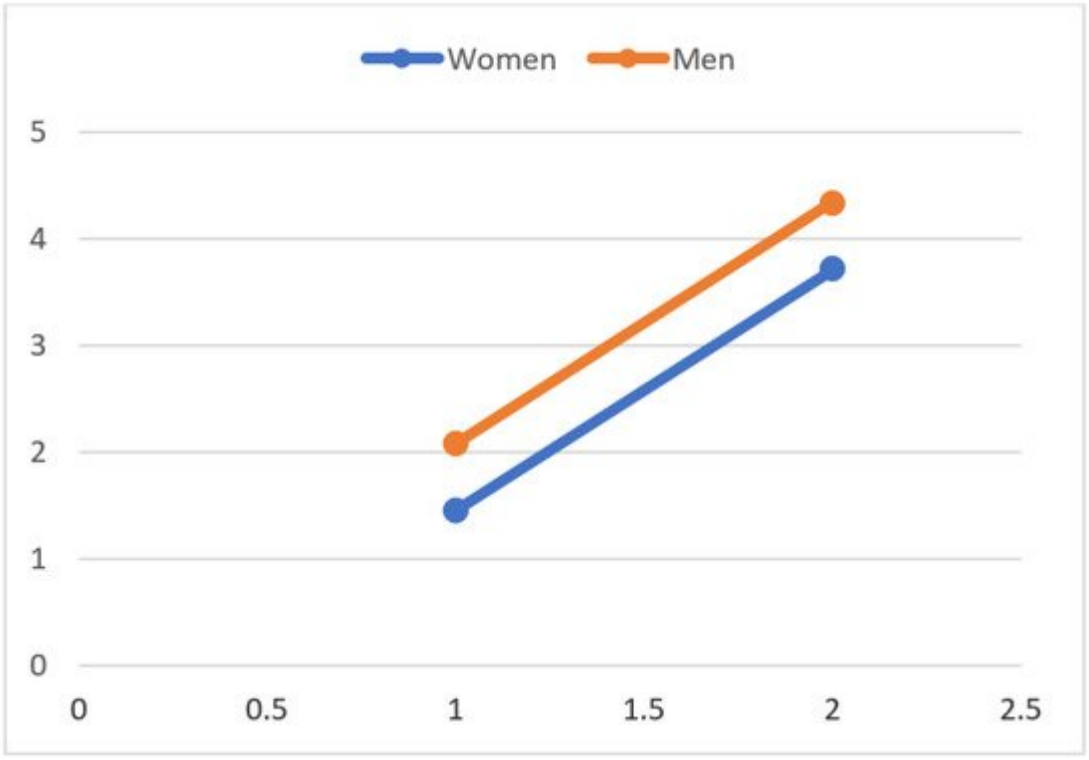

Figure 2. The number of sport disciplines practiced before onset of the first symptoms and after cementless THA. Women increased from 1.4 to 3.7 ($p < 0.0001$), and men increased from 2.1 to 4.4 practiced disciplines ($p < 0.0001$). The values are shown as mean values.

Sixty-seven percent of the patients initiated sports and recreational activities within three months after surgery, 17% between 3 and 6 months after surgery, and 17% six months after surgery. Overall, there was a significant increase in the types of sports performed (**Table 2** and **Table 3**). These activities are consistent with the Hip Society member's consensus guidelines and the American Association of Hip and Knee Surgeons, who have determined which sports are listed as low-, middle-, or high-impact activities, and do not manifest patient goals and expectations [15].

Table 2. Sports disciplines before onset of the first symptoms and after THA.

Discipline	Prior to THA, *n* (%)	After THA, *n* (%)	*p*-Value
Long Walks	8 (22.2%)	27 (75%)	<0.0001
Biking	12 (33.3%)	29 (80.6%)	<0.0001
Hiking	5 (13.9%)	21 (58.3%)	<0.0001
Nordic-Walking	1 (2.8%)	6 (16.7%)	0.063
Fitness Training	6 (16.7%)	23 (63.9%)	<0.0001
Alpine skiing	4 (11.1%)	6 (16.7%)	0.500

Discipline	Prior to THA, *n* (%)	After THA, *n* (%)	*p*-Value
Jogging	2 (5.6%)	8 (22.2%)	0.031
Soccer	2 (5.6%)	2 (5.6%)	0.500
Handball	2 (5.6%)	2 (5.6%)	0.500
Volleyball	1 (2.8%)	3 (8.3%)	0.250
Golf	1 (2.8%)	1 (2.8%)	0.500

Discipline	Women			Men		
	Prior to THA, *n* (%)	After THA, *n* (%)	*p*-Value	Prior to THA, *n* (%)	After THA, *n* (%)	*p*-Value
Long Walks	3 (8.3%)	12 (33.3%)	0.004	5 (13.9%)	15 (41.7%)	0.002
Biking	4 (11.1%)	11 (30.6%)	0.016	8 (22.2%)	18 (50%)	0.002
Hiking	1 (2.8%)	5 (13.9%)	0.125	4 (11.1%)	16 (44.4%)	<0.0001
Nordic-Walking	0	3 (8.3%)	0.250	1 (2.8%)	3 (8.3%)	0.500
Fitness Training	0	10 (27.8%)	0.002	6 (16.7%)	13 (36.11%)	0.016
Alpine skiing	0	0	1.000	4 (11.1%)	6 (16.67%)	0.500
Jogging	1 (2.8%)	2 (5.6%)	1.000	1 (2.8%)	6 (16.67%)	0.063
Soccer	0	0	1.000	0	2 (5.6%)	0.500
Handball	1 (2.8%)	1 (2.8%)	1.000	1 (2.8%)	1 (2.8%)	0.500
Volleyball	0	1 (2.8%)	1.000	1 (2.8%)	2 (5.6%)	0.500
Golf	0	0	1.000	1 (2.8%)	1 (2.8%)	0.500

4. Return to Sports

The frequency (sports sessions per week) increased significantly from the level before the onset of the first symptoms to the last follow-up: patients were active one day per week before the onset of the first symptoms and three times per week after THA ($p < 0.0001$). In the analysis of the subgroups, male and female patients participated in sports at the same frequency (three times per week) as the last follow-up ($p = 0.869$) (**Figure 3**).

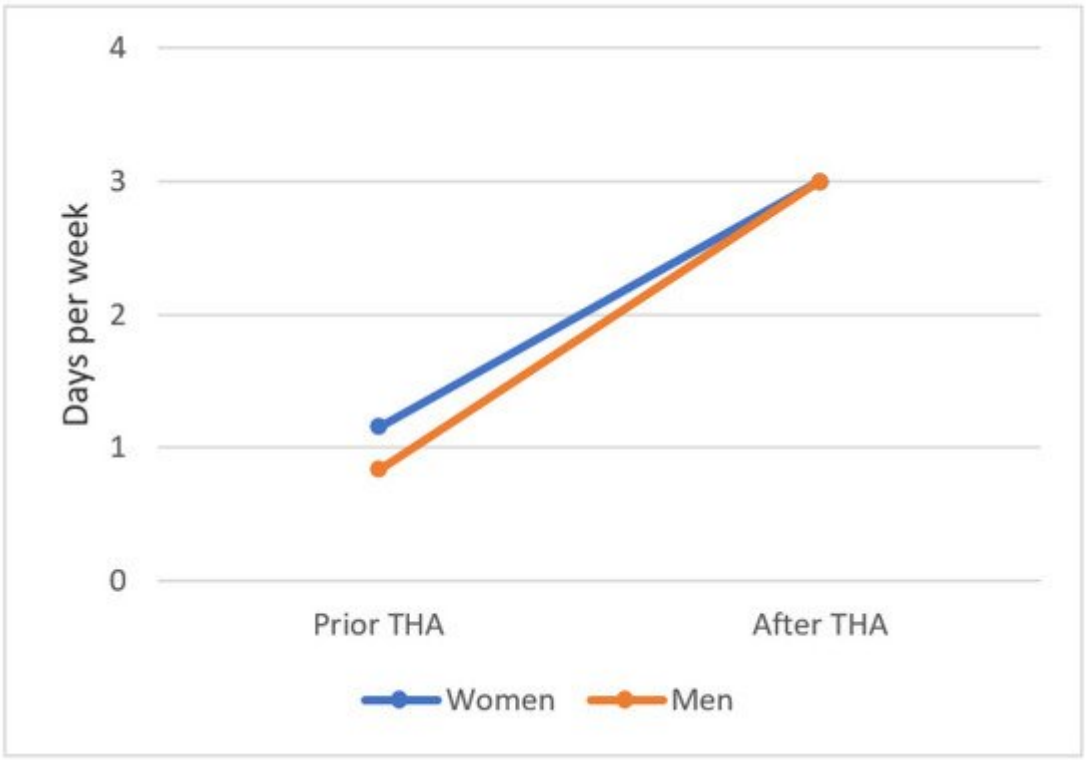

Figure 3. The number of sports sessions per week before onset of the first symptoms and after cementless THA. Women increased from 1 to 3 (p = 0.002), and men increased from 0.8 to 3 days per week (p < 0.0001). The values are shown as the mean values.

The minimum session length per week increased from 23 ± 31.6 (0–120) minutes before onset of the first symptoms to 82 ± 40.8 (0–150) min at the last follow-up (p < 0.0001). Before onset of the first symptoms, women exercised 18.4 ± 33.1 min, and men exercised 25.4 ± 31.2 min per session. Postoperatively, there was a significant increase in the number of minutes per session practiced; women exercised 85.4 ± 34.3 min, and men exercised 80.2 ± 47.3 min (p < 0.0001). There was no postoperative significant difference in session length per week between male and female patients (p = 0.716) (**Figure 4**).

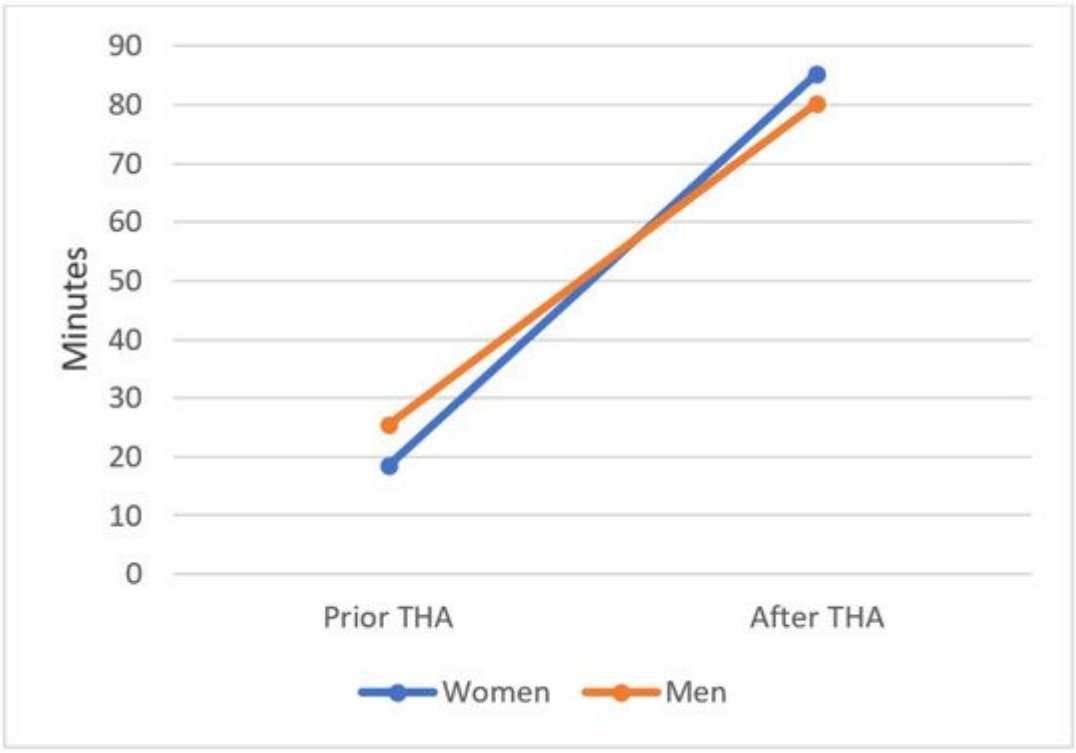

Figure 4. Session length per week of each sport before onset of the first symptoms and after cementless THA. Women increased from 18.4 to 85.4 min, and men increased from 25.4 to 80.2 min. The session length increased significantly. Values are shown as the mean values. $p < 0.0001$.

Eighty-five percent of the patients reported an enhancement in sports and recreational activity due to THA.

2.4. Outcome Scores

Paired *t*-test analysis of preoperative and postoperative reported outcomes demonstrated statistically significant improvements in mHHS (34.1 ± 18.6 vs. 92.6 ± 12.3; $p < 0.0001$), UCLA (3.2 ± 1.9 vs. 7.6 ± 1.5; $p < 0.0001$), and VAS (8 ± 1.7 vs. 1 ± 1.7; $p < 0.0001$) scores. Postoperatively, 31 patients (86%) reported a UCLA score ≥7, corresponding to being highly active in sport activities (**Table 4**).

Table 4. Pre- and postoperative patient-reported outcomes.

Score	Preoperative	Postoperative	*p*-Value
mHHS	34.1 ± 18.6 (3.3–81.4)	92.6 ± 12.3 (41.8–100)	<0.0001
UCLA	3.2 ± 1.9 (1–8)	7.6 ± 1.5 (3–10)	<0.0001
VAS	8 ± 1.7 (3–10)	1 ± 1.7 (0–7)	<0.0001

5. Achievement of MCID, SCB, and PASS

The MCID threshold scores of mHHS was 20. Postoperatively, a total of 32 patients (89%) achieved MCID for the mHHS. The SCB threshold scores of mHHS was 52.8. Postoperatively, a total of 21 patients (58%) achieved SCB for the mHHS. The PASS threshold scores were 85. Postoperatively, a total of 28 patients (78%) achieved PASS for the mHHS.

6. Conclusions

A large number of patients 40 years or younger who underwent THA returned to sports, and their sporting ability increased significantly. Eighty-six percent of the patients were highly active with a UCLA score ≥7. Furthermore, the reported MCID, SCB, and PASS for mHHS were achieved by more than 80% of our patients.

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