

Rehabilitation following knee prosthesis surgery

Ambulatory or stationary?



Dr. Volker Sauer

Dr Volker Sauer, Bruchsal, examined with colleagues the success of a stationary versus ambulatory rehabilitation treatment of patients suffering from gonarthrosis with a total knee replacement in the scope of a prospective randomised controlled study. In the following, he reports on the results.

There are manifold possible causes for a painful knee prosthesis. On the one hand the surgeon can be therefore responsible with the selection of an unsuitable prosthesis, a wrong implantation of one or more components or an excessive indication. On the other hand, the perioperative management may contribute because of insufficient pain therapy and follow-up treatment caused by an omitted early mobilisation or insufficient physiotherapy. Finally patient relevant causes such as somatisation disorder, desire to retirement or too high expectations can be responsible.

We are able to influence and largely eliminate the surgeon- and clinic-specific risks. However, we only have a restricted influence on patient relevant factors. Regarding the follow-up treatment, there are several options that we compare in the scope of a prospective randomised controlled study with other identic conditions: stationary versus ambulatory follow-up treatment.

40 patients with gonarthrosis have been enrolled in the study

Each 40 patients with gonarthrosis, whom one surgeon implanted a bicondylar mobile "bearing" knee prosthesis with navigated assisted surgery, have been randomised to the stationary or to the ambulatory rehabilitation group preoperatively. In the ambulatory rehabilitation group, the patients have been treated by the same physiotherapist during the first 3 weeks. The treatment included 1.5-2 hours daily intensive individual therapy in our clinic on 5 labour days per week (Fig. 1). Furthermore, the patient used daily a knee CPM machine at home in several sessions for a total duration of approx. 2 hours per day (Fig. 2; CPM: "continuous passive motion"). The stationary rehabilitation has been performed in the peripheral rehabilitation clinics according to their usual standard treatment concept for patients with total knee arthroplasty (TKA).



Fig. 1: Automobilisation with a Skateboard



Fig. 2: Home therapy with a Knee CPM Device

Primary and secondary endpoints

The Knee Society Score (KSS) and the Oxford Score have been defined as primary endpoints to evaluate the clinical results; they have been determined preoperatively and postoperatively at 6, 12 and 52 weeks, respectively. Secondary endpoints (mobility, pain) have also been evaluated at the investigation points mentioned above. A data evaluation has been conducted by a statistical covariance analysis at the respective examination points with the following review of the significance level by means of post-hoc tests and Bonferroni correction. Here the groups have been compared pairwise. A value of $p < 0.05$ was seen as statistically significant. The patient groups of the stationary and ambulatory rehabilitation group were similarly distributed regarding age, gender and body mass index (BMI).

Ambulatory group with significantly better results

Preoperatively the KSS and the Oxford Score as well as the mobility in both groups did not show any significant differences. Due to several problems (stroke, renal failure, periprosthetic fracture following a fall) it was possible to evaluate 37 patients of the stationary rehabilitation group and 39 patients of the ambulatory rehabilitation group. The KSS of the ambulatory rehabilitation group was significantly more increased at all postoperative examinations compared to the stationary rehabilitation group. The postoperative flexion of the ambulatory rehabilitation group revealed a significantly increased range of motion at all investigation points versus the stationary rehabilitation group (122° vs 112° 1 year postop.). The Oxford Score was also significantly higher at all postop. investigations in the ambulatory rehabilitation group versus the stationary rehabilitation group (table 1).

Table 1: Results

Scores	group	6 weeks	12 weeks	52 weeks
KSS	stationary	79.8 +/- 17.8	84.3 +/- 18.6	90.2 +/- 14.4
Mean+/-SD	ambulatory	90.6 +/- 10.7	95 +/- 9	97.5 +/- 4.5
Oxford	stationary	31 +/- 7.3	35.9 +/- 7.3	38.1 +/- 12.4
Mean+/-SD	ambulatory	37.4 +/- 4.8	40.9 +/- 4.8	42.8 +/- 4.3

(KSS = Knee Society Score, SD = standard deviation)

Ambulatory rehabilitation as an excellent alternative

The ambulatory rehabilitation with intensive physiotherapy 5 days per week and the multiple daily knee CPM application is an excellent alternative to the normally applied stationary rehabilitation following total knee arthroplasty due to the significantly better clinical results in this study. The ambulatory treatment shall also be considered under health-economic aspects. However, a detailed cost comparison of both methods has not been performed in this study.

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Thursday, 27th October 2016
Prevention and Rehab
11:00 am—12:30 pm, Dublin
(12:09 pm—12:18 pm: Ambulatory or stationary rehabilitation? A prospective randomised controlled study)
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