Does flexion contracture continue to improve up to five years after total knee arthroplasty?

K Cheng, H Dashti, G McLeod
Department of Orthopaedic and Musculoskeletal Trauma, Perth Royal Infirmary, Taymount Terrace, Perth, Perthshire, United Kingdom

ABSTRACT

**Purpose.** To determine whether flexion contracture continues to improve up to 5 years after total knee arthroplasty (TKA).

**Methods.** Records of 200 women and 123 men (mean age, 72 years) with osteoarthritis and preoperative flexion contracture were reviewed. 155 (48%) involved the left knee and 168 (52%) the right knee. Patients were assessed clinically before TKA and one and 5 years later, by a single researcher using a goniometer to measure flexion contracture, range of movement, maximum flexion, and the Knee Society Score. In all patients the same prosthesis design was used. The surgical technique was standard and involved a medial parapatellar approach with bone resection.

**Results.** All variables improved significantly from pre-TKA to one-year post-TKA and from one-year post-TKA to 5-year post-TKA; respectively the mean flexion contracture decreased from 11º to 3º to 2º; the mean knee range of movement increased from 90º to 103º to 107º; the mean maximum flexion increased from 101º to 106º to 109º; and the mean Knee Society Scores increased from 39 to 87 to 90.

**Conclusion.** Functional outcome and flexion contracture may continue to improve up to 5 years after TKA.

**Key words:** arthroplasty, replacement, knee; contracture

INTRODUCTION

Range of movement (ROM) and pain relief are important outcome variables following total knee arthroplasty (TKA). In patients undergoing primary TKA, 61% of knees presented with flexion contractures. Moreover, preoperative ROM is the strongest predictor of postoperative ROM.

Flexion contracture results from a combination of ligamentous, capsular, and bony deformities, in which forces exerted across the patellofemoral and
tibiofemoral joints increase and adversely affect knee biomechanics. A minimum of 90° flexion is required for normal daily activities, anything less will severely affect quality of life.3,4

We aimed to determine whether functional outcome and flexion contracture continue to improve up to 5 years in primary TKA patients.

MATERIALS AND METHODS

Between 1989 and 2002, 342 patients (353 knees) were diagnosed with osteoarthritis and preoperative flexion contracture. 30 knees were excluded from the analysis because of loss to follow-up (n=14) and complications affecting rehabilitation (n=16), including: deep vein thrombosis (n=4), infection (n=4), and revision (n=8, one for arthroscopic washout, one for patella resurfacing, and 6 for arthrotomy and division of adhesions). The remaining 323 (155 [48%] left and 168 [52%] right) knees involving 200 women and 123 men (mean age, 72; standard deviation [SD], 7 years) were reviewed.

Patients were assessed clinically before TKA and one and 5 years later. Maximum flexion and ROM were recorded using a goniometer with the patient in a supine position. Knee Society Scores5 were also assessed. All patients used the same prosthesis design (Kinemax cemented prosthesis, Howmedica, Rutherford [NJ], US). The surgical technique was standard and involved a medial parapatellar approach with bone resection. To achieve full extension of the knee without pressure, posterior cruciate ligament excision and soft tissue balancing were performed. Postoperatively a passive motion machine was used for 24 hours and followed by intensive physiotherapy.

The paired t test was used to compare preoperative and postoperative results. A p value of <0.05 was considered significant.

RESULTS

All variables improved significantly from pre-TKA to one-year post-TKA and from one-year post-TKA to 5-year post-TKA (p=0.001, Table); respectively the mean flexion contracture decreased from 11° (SD, 6°) to 3° (SD, 5°) and to 2° (SD, 4°); the mean knee ROM increased from 90° (SD, 18°) to 103° (SD, 15°) and to 107° (SD, 15°); the mean maximum flexion increased from 101° (SD, 17°) to 106° (SD, 13°) and to 109° (SD, 14°). The mean Knee Society Scores increased from 39 (SD, 16) to 87 (SD, 15) and to 90 (SD, 9). Extension lag was not apparent in any of the patients.

DISCUSSION

Improvement in ROM following TKA (in patients with no flexion contracture) appears to plateau at one-year postoperation.6–9 Therefore, studies of factors influencing ROM should not require follow-up for more than one year.10 However, reduction in flexion contractures and increase in flexion have been reported in longer-term studies on patients with flexion contracture.11–13 697 TKA patients were followed up for one to 16 years, but no postoperative improvement or deterioration in flexion contracture was reported,1 probably because the cohort was very heterogeneous in terms of the diagnosis, type of surgery, prosthesis, and assessment. Our cohort was homogeneous (osteoarthritis patients with flexion contracture undergoing primary TKA with the same implant) and assessed by a dedicated research assistant, with a high intra-observer correlation in goniometer measurement.14 Further studies are required to ascertain whether improvements observed in this study continue beyond the 5-year period.
REFERENCES