Ten-year survival of the cemented Freeman-Samuelson primary knee arthroplasty

DATA FROM THE SWEDISH KNEE ARTHROPLASTY REGISTER AND THE ROYAL LONDON HOSPITAL

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We report a ten-year rate of survival of 96% for the cemented Freeman-Samuelson knee arthroplasty in patients from the Swedish Knee Registry and the Royal London Hospital with revision for aseptic loosening as the criterion for failure.

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It has been argued that surgeons should base decisions regarding implants on published clinical results in peer-reviewed journals and that the rate of survival is one of the most important factors to consider. We describe the ten-year survival of the Freeman-Samuelson prosthesis with a tibial metal back and stem fixed by cement (Sulzer Orthopaedics AG, Baar, Switzerland). We have not included the functional or radiological findings since these data are not available from the Swedish Knee Register.

Materials and Methods

The Swedish Knee Register contains records of primary arthroplasties and revision procedures performed since 1975; it is updated annually and was most recently validated in 1997 by questionnaire. The entry data do not specify the absence of a tibial metal back and stem but the use of such prostheses was rare, if it occurred at all, in the study period.

Kaplan-Meier survival statistics (SPSS software; SPSS Inc, Chicago, Illinois) were used to estimate the rate of revision. Confidence intervals (CI) were calculated using the Wilson quadratic equation with Greenwood and Peto effective estimates of the size of the sample.

At the Royal London Hospital, between 1982 (the first use of a tibial metal back) and 1995 (the close of the study) most prostheses were inserted either without a tibial metal back and stem or without cement on one or both components. However, studies of tibial and femoral fixation showed that the use of a tibial metal back and stem for the tibia and of cement for both components provided the most secure fixation. This technique had been used on an informally randomised basis between 1982 and 1995 on 197 knees and these prostheses form the material for this study. Follow-up was by interview or telephone at regular intervals. Nineteen elderly patients were lost; to conform

Table I. Details of the patients in the Swedish Knee Register and at the Royal London Hospital

<table>
<thead>
<tr>
<th>Royal London Hospital</th>
<th>Swedish Knee Register</th>
</tr>
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<tbody>
<tr>
<td>Diagnosis*</td>
<td></td>
</tr>
<tr>
<td>OA</td>
<td>133</td>
</tr>
<tr>
<td>RA</td>
<td>56</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
</tr>
<tr>
<td>Mean age in years</td>
<td>65.8</td>
</tr>
</tbody>
</table>

* OA, osteoarthritis; RA, rheumatoid arthritis

Fig. 1

Survival curve for the Freeman-Samuelson knee arthroplasty in the Swedish Knee Survey. The upper and lower lines represent 95% confidence intervals.
with the Swedish data they are not treated statistically as having been revised.

Results

There were 2695 primary cemented Freeman-Samuelson arthroplasties in the Swedish Knee Register. The mean age of the patients was 71.4 years and 73% had primary osteoarthritis (Table I). By 1995, 78 had required revision, 36 for loosening, 24 for infection, ten for patellofemoral dysfunction, five for instability, one for fracture of the tibial component, one for contracture and one for an unknown reason. At ten years the rate of survival for aseptic loosening was 96.6% (CI 87.5 to 97.6) (Fig. 1). Patients with rheumatoid arthritis had a lower rate of revision but this was not statistically significant.

There were 197 primary arthroplasties at the Royal London Hospital. The mean age of the patients was 65.8 years and 67.5% had primary osteoarthritis (Table I). At ten years 11 had required revision, four for infection, three for fracture of a prototype tibial component, three for loosening and one for an unknown reason. The ten-year survival was 96% (CI 90 to 100) for aseptic loosening (Table II).

Discussion

Both groups of knees, either operated on in Sweden or in the originator’s hospital, but not necessarily by the originator, gave essentially the same cumulative survival of 96% at ten years with revision for aseptic loosening as the endpoint. The similar outcome in the two populations suggests that this represents an accurate description of the outcome for this cemented total knee arthroplasty.

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References