3 The Development of Total Hip Replacement

3.1 The Different Total Hip Prostheses Used at Cochin

M. Postel

It is instructive to look back at our practices for using certain types of prostheses, at their results, and at how the lessons we drew from them directed the development of our future choice. The changes made were few and were motivated only by the hope of providing a solution to a specific problem (Fig. 3.1).

The first prostheses that we used were of the metal-on-metal type, derived from the McKee prosthesis and called the McKee-Merle d’Aubigné prosthesis. From the beginning of 1966 the number implanted per year rose very quickly, reaching 363 by 1969. However, from 1969 on, the Charnley prosthesis began to hold an important place. The metal-on-metal low-friction band prosthesis was introduced in 1971, and for several years it was used along with the modified version of the Charnley prosthesis. In 1975, the modified Charnley prosthesis became the only prosthesis in use in our department. The only exceptions were trials with aluminum prostheses and with linked cemented cups.

A long time is necessary in order to judge the defects of one type of prosthesis, and advances must be made very carefully if all that has been gained is not to be lost. The better the results, the slower the change.

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Fig. 3.1. Types of prostheses used each year from 1965 to 1982 in 8000 THRs at Cochin. MK MA, McKee-Merle d’Aubigné prosthesis; LFB, low-friction band prosthesis; J CH, Charnley prosthesis; CH MK, Charnley prosthesis modified by Kerboul; D, a variety of prostheses used in several partial revisions, aluminum prostheses, linked cemented cup
3.2 The McKee-Merle d’Aubigné Prosthesis

M. Postel and C. Fayeton

The first total hip replacement used in large numbers in our department was a metal-on-metal, slightly modified McKee prosthesis known as the McKee-Merle d’Aubigné prosthesis (MK MA; Fig. 3.2).

The initial results were excellent and as good as those that we had seen in G. McKee’s own department. This led us to widen our indications for surgery, which had been very restricted. The number rose rapidly, with 245 prostheses implanted in 1968 and 380 in 1969.

Here we will study the outcome of 113 of these replacements, which represent nearly the total sum of our work in 1967. The average age of the patients was 64 years. Half of the patients (53%) suffered from primary osteoarthritis and a quarter (26%) from secondary osteoarthritis. One-third were followed up for the maximum possible period of 15 years, and the average follow-up was 9 years.

Overall, this series produced 44% poor or bad results and 56% good or very good results. Twenty-two hips had to be revised. Eighteen of these showed aseptic loosening and four were both loose and infected.

For the 91 hips that were not revised, and with an average follow-up of 9 years, the sum of the pain-movement-stability score was an average of 14.8 out of a possible 18. One-third of the patients had poor or bad results while two-thirds had good results. We should point out that in this series there were 17 loosenings that we were not able to revise. This was because of the age and general condition of the patients or because they died or became lost to follow-up before the revision could be carried out.

However, the particular features of these loose prostheses were most interesting. On reviewing all of the case histories, we found that 33 patients (29%) presented with serious mechanical problems related to the cup. This is an impressively large proportion (Table 3.1).

The majority of the problems became apparent during the 2nd or 3rd year. Not all of them were diagnosed at that time, and it often took several more years for us to be sure. However, the clinical and radiological signs of loosening - which we now understand better - and a retrospective study of these patients' files show us that the problems appeared very early (Table 3.2).

They continued to appear as the years passed and occasionally presented in quite an acute way. A hip that seemed to be progressing very well would suddenly deteriorate over a few months. In fact, a careful examination of the old roentgenograms showed us that all had not been completely satisfactory in the roof of the acetabulum (Fig. 3.3).

What was the reason for this large number of loosenings? There is no doubt that our operative technique in 1967 contained many faults of which we are now

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**Table 3.1. Aseptic loosening of the McKee-Merle d’Aubigné prosthesis**

<table>
<thead>
<tr>
<th></th>
<th>Cups</th>
<th>Femoral components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revised</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>Not revised</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>35 (31%)</td>
<td>5</td>
</tr>
</tbody>
</table>

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**Table 3.2. Time of onset of acetabular loosening**

<table>
<thead>
<tr>
<th>Onset (years post-op)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>?a</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of loosenings</td>
<td>4</td>
<td>10</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

a Date not available from case files