8 Infective Complications of Total Hip Replacement

8.1 Introduction

J. Evrard

Although infective complications of total hip replacement have already been mentioned, they are worthy of a chapter in their own right because of the problems that they present in both diagnosis and treatment. Before studying infected arthroplasties in detail we shall consider their incidence, significance, and cost.

The incidence of infection is difficult to assess. Eftekhar [1] produced figures from several American hospitals that varied from 0% to 11%. However, they were drawn from a wide spectrum of operative conditions; some used the Charnley tent and some gave prophylactic antibiotics, while others used both or none at all. This explains the wide differences in the percentage of infection reported.

We can provide two statistics from our own department that seem to be of more value:

- Among the first 500 Charnley prostheses implanted at Cochin, there were 17 infections (3.3%). To this must be added 15 doubtful cases of infection, giving a rate of more than 6%.
- The survey from the Group Studying the Prophylactic Treatment of Infection in Joint Replacement (GETPIA) included 415 patients from our department, 11 of whom were infected (2.6%). This was a randomized study and can be divided into two groups. The group given prophylactic antibiotics included one infection (0.4%), while there were ten infected cases in the placebo group (4.8%).

The gravity of these infections is clear. They require admission to hospital and involve repeated surgery. In our series, the mortality directly attributable to infection was 3%. The cost to society is high. The figure of $25 000 per year in the U.S.A. quoted by Nelson [2] seems to be reasonable.

A classification is necessary in order to study the clinical types of infection. The classification most commonly used at present, especially in the English literature, does not appeal to us, as we do not think that superficial infections should be in a separate group. If the infection is really superficial then it is of no significance; conversely, a serious infection is not superficial. Similarly, infected hematomas should not be put into a separate category, as they fall into the group of deep infections.

We therefore distinguish between:

- Early infections, which may be acute or subacute
- True late infections, similarly acute or subacute
- Secondary infections, which are the most common.

They progress chronically and may appear months or years after surgery, in a variety of presentations, and may eventually produce an acute purulent discharge.

References

8.2 The Patients

C. Gaudillat

We have studied 264 patients with infected hip replacements treated at Cochin between 1968 and 1980. In 186 patients the primary arthroplasty had been performed at Cochin, while the 78 other cases were referred to us for treatment, the prosthesis having been implanted elsewhere.

A study of the septic complications in our department, according to the year in which the prosthesis was implanted (Fig.8.1), shows that there was a progressive increase until 1974 (20–30 septic cases a year), after which there was a rapid fall to less than 20, and even as few as ten cases a year. The introduction of routine prophylactic antibiotic therapy from 1975 onward is undoubtedly the reason for this dramatic fall. The failure to recognize possible chronic infections is not likely to have been a factor over such a long period, as these would have had time to manifest themselves
between 1975 and 1978. On the other hand, this could possibly have played a part in the years from 1979 to 1980.

At the time of diagnosis of the infection, 187 patients had only one prosthesis; 72 patients had two arthroplasties, and in only two of these cases was the infection bilateral.

In 14 patients, a prosthesis was implanted into the other side after treatment of infection in the first hip, and in 13 cases no problems have arisen. Only one patient gave cause for concern 3 years later, although no definite diagnosis of infection was made.

We have looked for any factors that may predispose to infection. If we compare the 186 infected arthroplasties from Cochin with the series of uninfected arthroplasties reviewed earlier, we find no significant difference among the two groups concerning age, obesity, underlying pathology, blood loss, or duration of the operation. Paradoxically, there was a slightly lower incidence of infection in long and difficult procedures, but these were usually performed by more experienced surgeons.

The only predisposing factor was diabetes: 5% of the patients with infected arthroplasties were diabetic as compared with 2% in the uninfected group.

Among all the patients whom we have followed up, 30 are known to have died. (This figure is no doubt much higher among the more aged. Among those over 75 years of age, half have been lost to follow-up over the 3-year period, especially those who came from the provinces, have retired, or lived in nursing homes.) Fifteen of these patients died after the infection had been cured, and in 15 patients the infection was still present at the time of death, which was directly due to infection in eight of the 15 (3% of all infected patients). It was caused by septic shock, acute adrenal insufficiency, or other medical complications; one patient died immediately postoperatively. The cause of death in the other seven patients was malignancy in six cases, hepatitis in one.

Is there any evidence that an impaired state of immunity predisposes to the persistence of infection? This was definitely so for a woman with a severe infection who died from aplastic anemia; she was also receiving chemotherapy. No definite conclusions can be reached in other cases.

Finally, it should be noted that among the 1313 total arthroplasties carried out at Cochin that have been studied in detail, 720 of the patients were given systemic prophylactic antibiotics, and of those, 1.8% required revision because of infection; 593 did not receive prophylactic antibiotics, and 3.4% of this group required revision for sepsis, twice the above figure.

8.3 Early Infection

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Early infection is an uncommon occurrence, following gross contamination of the wound during surgery, and it is usually iatrogenic. We shall study the 28 such cases that have been seen at Cochin from 1968 to 1980.

Infection can appear very early, during the first 4 days postoperatively, or slightly later, at the end of the 1st month. Less commonly, it may be delayed, presenting between the 30th and 90th days (Table 8.1).

In the most typical case, the clinical picture rapidly develops into the acute condition. There is acute pain and high, fluctuating pyrexia, and there may also be systemic signs. On examination, there are the local signs of a thigh that is red, hot, swollen, and painful. There may already be a discharge from the suture line, and a swab may be taken for culture and sensitivity. One or a series of blood cultures should also be taken.

Early subacute infection is less common; five of the 28 cases presented later, at 10 or more days postoperatively. The signs of infection are less marked; the fever is only 38°-38.5°C, and local signs are minimal or even absent.

In difficult cases where it is not clear whether the hip is really the cause of the pyrexia, the joint should be aspirated without delay.

Table 8.1. Date of onset of early infection

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Number of Cases</th>
</tr>
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<tbody>
<tr>
<td>First month</td>
<td>18 immediate</td>
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<tr>
<td></td>
<td>5 between the 12th and 26th days</td>
</tr>
<tr>
<td>1st and 3rd months</td>
<td>5</td>
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