CHARNLEY LOW-FRICTION ARTHROPLASTY IN DIABETIC PATIENTS

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A retrospective study of 44 diabetic patients who, between them, had 62 Charnley low-friction arthroplasties, showed a superficial-infection rate of 9.7 per cent and a deep-infection rate of 5.6 per cent. All the operations were carried out in the Charnley clear-air enclosure and prophylactic antibiotics were not used. A statistically significant increase in the overall rate of infection was found in diabetic patients when compared with non-diabetic osteoarthritic patients (P < 0.001) and rheumatoid patients (P < 0.01). Hence it is suggested that in diabetic patients there may well be a place for prophylactic antibiotics in hip replacement surgery in addition to the use of the clear-air enclosure.

Experimental work done by Drachman, Root and Wood (1966) and Mowat and Baum (1971) has shown a defect in the mechanism of phagocytosis in patients with diabetes mellitus. However, there have been no reports in the literature showing increased susceptibility of diabetic patients to infection after routine operative procedures. Charnley and Eftekhar (1968) stated that in hip replacement surgery the selection of patients was prejudiced against diabetics because of the risk of infection, but they offered no evidence to support this view. Hence, this study of diabetic patients who had total hip replacements was carried out with particular reference to postoperative infection. The results were then compared with published results of infection rates in non-diabetic patients with osteoarthritis and with rheumatoid arthritis.

MATERIALS AND METHOD

Sixty-six low-friction arthroplasties were carried out between January 1967 and December 1980 on 48 diabetic patients; a total of 16 613 low-friction arthroplasties were done at the Centre for Hip Surgery during this period. The hospital case notes and radiographs of these diabetic patients form the basis of this study. All the operations were carried out in a clean-air enclosure using the lateral approach with only minor variations in the technique of re-attachment of the trochanter. Prophylactic antibiotics were not used systemically, locally, or in the cement. Superficial infection was diagnosed by the clinical appearance of the wound in the early postoperative period; the features sought were induration, serous discharge, or the formation of a superficial abscess without involvement of the implants. Deep infection was diagnosed from the symptoms and signs and confirmed by haematological and radiographic changes showing involvement of the implants.

RESULTS

There were 48 diabetic patients who underwent 66 low-friction arthroplasties. Twenty-nine were men and 19 were women. Their ages ranged from 25 to 79 years with an average of 61.5 years. Four patients (four hips) were excluded from the study as they were followed up for less than one year. In the remaining patients, the follow-up ranged from one year to seven years six months with an average of 27 months. Diabetes was controlled by diet alone in 10 patients. Twenty-four patients were on oral hypoglycaemic agents while 10 were on parenteral insulin. In addition to the diabetes, one patient had rheumatoid arthritis and one had ulcerative colitis. None of the patients in the study were being treated with steroids.

Six patients (six hips, 9.7 per cent) developed superficial infection. The causative organisms were *Staphylococcus aureus* in two patients, haemolytic *Streptococcus* in one, and coagulase-negative *Staphylococcus* in one; in two patients the cultures were negative. Of the six patients with superficial infection, three were on oral hypoglycaemic agents, two were controlled by diet and one was on parenteral insulin.

Three patients (four hips, 6.5 per cent) developed deep infection; in one this followed a superficial infection. The patient with bilateral deep infection was on parenteral insulin. Of the remaining two patients, one was only on a diet and one was on oral hypoglycaemic agents. The causative organisms for deep infection were coagulase-negative *Staphylococci* in three hips and *Staphylococcus aureus* in one. All four hips were revised.
One patient died from pulmonary embolism after revision. The other two patients, including the one with bilateral infection, are well and have not had a recurrence of infection 18 months and two years after revision.

**DISCUSSION**

The introduction of the clean-air enclosure in total hip replacement surgery has dramatically reduced the rate of deep infection to less than 0.5 per cent (Charnley 1970). Van Niekerk and Charnley (1979) reported a superficial-infection rate of 2.9 per cent and a deep-infection rate of 0.3 per cent in 1557 low-friction arthroplasties in osteoarthritic patients. The corresponding figures for rheumatoid arthritis in the same study were 7.4 per cent and 1.2 per cent. It has already been shown that male patients who require urethral instrumentation in the immediate postoperative period (Wroblewski and del Sel 1980) and patients with psoriasis (Menon and Wroblewski 1982) have a much higher rate of infection. The present study of diabetic patients reveals a highly significant increase in overall infection when compared with non-diabetic osteoarthritic patients (P < 0.001) and a significant increase when compared with non-diabetic rheumatoid patients (P < 0.01). Hence, it is suggested that in diabetic patients having low-friction arthroplasties there may well be a place for prophylactic antibiotics in addition to the use of the clean-air enclosure.

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**REFERENCES**


