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Venous leg ulcers after hip replacement

A CLINICAL EVALUATION AT 5 TO 12 YEARS

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Venous ulceration is a chronic disabling complication of deep-vein thrombosis. The aim of this study was to estimate the incidence of venous leg ulcers five years or more after total hip replacement (THR) and to investigate some of the clinical features associated with their development.

We carried out a postal survey of all patients who had undergone a THR 5 to 12 years previously. Replies from 816 patients showed that 66 (8.1%) had a history of leg ulcers. The prevalence of active ulceration was 2.6% and 43 patients (5.3%) reported developing ulceration since their hip replacement. A clinical review determined that 31 (3.8%) of these were true venous ulcers. The ulcers occurred more commonly on the operated side and developed at a mean of 5.8 years (18 months to 12 years) after the first arthroplasty. A mean of 1.9 arthroplasties (1 to 5) (primary and revision) were carried out before the ulcers appeared. The overall incidence of ulcers was similar to that in the general population.

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The prevention of deep-vein thrombosis (DVT) after total hip replacement (THR) is important in reducing the risk of both pulmonary embolism (PE) in the perioperative period[1] and postphlebitic limb syndrome (PPLS) later.[2] Death from PE has fallen since the early era of THR, and now occurs in 0.2% to 0.4% of cases.[1] Whether chemical prophylaxis, which carries its own risks, should be used routinely remains controversial.

There have been no reports of the incidence of PPLS after THR.[3] If this incidence and that of venous ulceration is higher than would be expected for the general population, a stronger case for DVT prophylaxis could be made. Patients would also need to be warned of this potentially serious complication before consenting to surgery.

The aim of this study was to determine the incidence of venous ulceration after THR and to compare this with the previously reported incidence in the general population.

Patients and Methods

According to our records, 1560 patients had undergone 1603 THRs between 1989 and 1995 at the Horder Centre for Arthritis, Crowborough. Of these, 93 patients were known to have died before the start of the survey. A questionnaire was sent to 1467 patients between March and June 2001. Questionnaires were returned by the friends and relatives of 111 patients informing us of their death, and by the postal service for 20 patients who were no longer at the given address. Replies were returned by 816 patients (901 hips). The overall response rate was 63.2% with 540 non-responders. By applying the age-sex mortality rates for England and Wales to the patients who were sent the questionnaires, we estimated that 1095 patients would have survived to receive the questionnaire. This yields a shortfall in expected replies of 279, and an adjusted response rate of 74.5% (816/1095).

The questionnaire was aimed at identifying patients with leg ulcers. The questions were as follows:

1) Did you have leg ulcers before the operation?

2) Have you developed leg ulcers after the operation? If yes, are the ulcers on the operated or the other leg?

The patients who developed ulcers after the operation were then visited by one of the investigators (JSM, NN). Additional information was obtained from the medical records and those of the general practitioners (GPs) and district nurses. The review comprised a clinical history, assessment of the ulcer and the limb, and the possible aetiology of the ulcer. The history included a detailed record of lower limb arthroplasties, any occurrence of DVT and thromboprophylaxis used at the time of the operation. The time

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Table I. The aetiology for ulceration

Aetiology	Number of patients
Venous	31
Arterial	2
Flap laceration	1
Pressure sores	1
Cellulitis	1
Long-standing ulcers	2
Spurious information	5
Total	43

Table II. Other clinical features of the 31 patients with venous ulcers

Other clinical features	% patients (n)
Varicose veins	*29.0* (9)
Eczema	*48.4* (15)
Hyperpigmentation	*74.2* (23)
Induration	*67.7* (21)
Pain	*48.4* (15)

Table III. The medical history of the 31 patients with venous ulcers

	Number of patients
Rheumatoid disease	7
Heart failure	4
Peripheral vascular disease	3
Steroid treatment	2
Diabetes	1

Table IV. The laterality of DVT following hip arthroplasty as reported in the literature and laterality of venous ulcers in this study

	DVT (%)[17]	Venous ulcers (%)
Ipsilateral	57.6	54.8
Contralateral	22.1	19.4
Bilateral	20.3	25.8

between the index operation and the onset of the ulcer was documented, and the site and size of all the ulcers and their laterality. All other possible causes of leg ulcers were explored to verify true venous ulcers (Table I) and the clinical features were documented (Table II and III). Recurrence of the ulcer was noted. A digitised record of the size of the lesion was obtained where appropriate.

Results

Sixty-six patients (8.1%; 95% confidence interval (CI) 6.2 to 10.0) reported having ulcers before, after or both before and after the operation, eight had ulcers before the operation but not after, 15 had ulcers before, and in addition developed ulcers after the operation and 43 (5.3%; 95% CI 3.7 to 6.8) only developed ulcers after the operation. Clinical assessment of the 43 patients with ulcers which developed after the operation showed 12 patients who did not have a true venous ulceration (Table I). Ulcers in 31 patients (3.8%; 95% CI 2.5 to 5.1) were found to be true venous ulcers, and these patients were then evaluated in greater detail.

The mean age of the respondents of the questionnaire who did not have a leg ulcer was 76 years 11 months, while that of those with ulcers was 77 years 6 months. The ulcers were more common in females; 79% of the patients who developed leg ulcers after the operation were female, and 68% of respondents were female. Of the 31 patients with true venous ulcers, 18 had undergone more than one arthroplasty prior to the appearance of the ulcers. A mean of 1.9 arthroplasties (1 to 5) were carried out prior to the appearance of the ulcers. The ulcers appeared at a mean of 5.8 years (18 months to 12 years) after the first arthroplasty. An acute episode of DVT was documented in only four patients (12.9%). All patients wore Kendall TED graduated compression stockings (Tyco Healthcare, Redruth, Cornwall, UK) while in hospital, and were advised to continue to wear them until their outpatient appointment six weeks after the operation. A variety of other thromboprophylactic measures were also used (foot pumps, dextran and subcutaneous heparin in selected cases). All patients were mobilised within two days of surgery. At review, in 33% of the patients who had had an ulcer it had healed and in 45% it had recurred.

The ulcer was on the ipsilateral leg in 54.8% of patients, the contralateral leg in 19.4% and bilateral in 25.8% (Table IV). These figures include 18 patients who had a combination of 12 bilateral THRs, seven revision THRs and eight knee replacements. We analysed the side of the operation and the side of the ulcers in patients who had an arthroplasty prior to the appearance of the ulcers. Ipsilateral ulcers were found in nine patients, contralateral ulcers in three and bilateral ulcers in two patients. Hence, the relative proportion of ulcers on the operated side was 0.75 (CI 0.47 to 0.91).

Discussion

A latent period occurs between a thrombotic episode and cutaneous complications. The changes in the limb are attributed to a loss of the normal valvular function leading to venous hypertension and insufficiency.[4,5] Skin changes develop later, and are due to both superficial and deep reflux.[6] Generally, a venous ulcer is unlikely to appear earlier than a year after acute thrombosis.[7,8] Our study showed the minimum time interval between the occurrence of the ulcer and the index operation was 18 months (mean 5.8 years). Callum et al[9] reviewed a cross-section of patients with leg ulcers and attributed 67% to 70% to venous disease. In our study we found that among patients who developed leg ulcers after THR 72% of ulcers were due to venous pathology. Concurrence of at least one other factor besides the venous disease has been noted in 36% of the patients.[10] Our series demonstrated such features in 12 patients (38%) (Table III).

The clinical features associated with venous ulcers include pain, varicosities, pigmentation, oedema and induration. These can occur in varying proportions, although pain has been found in half the patients.[4] Our findings reflect a similar pattern (Table II). Recurrence of venous ulcers is common and has been reported as between 47% and 66%.[9,11,12] In our study recurrence of the leg ulcers was noted in 45% of the patients. Studies from different centres have found venous leg ulcers to be more common in females and elderly patients.[7,10,12] There have been relatively few large studies from which the incidence of venous leg ulcers can be assessed. These often do not distinguish between venous and other causes of ulceration, and usually report the prevalence of open ulcers in the general population, from which age-related prevalence and incidence data have to be estimated.

We have calculated overall incidence as we were interested in whether patients who have undergone THR have an increased risk of developing leg ulcers compared with the age-matched general population. Although we focused on those patients who developed venous leg ulcers for the first time following their THR, comparison with the general population is best made by comparing the overall incidence of leg ulcers (venous and non-venous) of patients in our study with estimates for that of the age-matched general population.

In a large Swedish study, Nelzen, Berqvist and Lindhagen[13] found that the ratio of open to healed leg ulcers was 1:2 and the prevalence of open ulcers was 0.9% between the ages of 50 and 59 rising to 3.2% between 80 and 89. This gives estimates of the overall incidence of ulcers, open and healed, as 2.7% between the ages of 50 and 59 rising to 9.6% between 80 and 89. Another study estimated the incidence of leg ulcers in the elderly population as 9.8% rising to 12.6% in the eighth decade.[14] A recent study by Muller et al[15] found that the incidence of ulceration following total knee replacement was 8.7%. Our study yielded a similar overall incidence of venous and non-venous ulcers of 8.1% (CI 6.2 to 10.0) in a largely elderly group of patients; at the time of follow-up only six patients were aged under 50 and 32 patients were aged between 50 and 59 years.

Of the 816 patients in our series, 21 reported open ulcers at the time of the survey, giving a point prevalence of venous and non-venous ulcers of 2.6%, which lies within the range of 0.7% to 3.2% estimated by Muller et al[15] from a number of studies. Although 8.1% of our respondents reported a leg ulcer, the figure falls to 5.3% when considering the patients who developed ulcers only after THR. On clinical evaluation, we found that only 3.8% of patients developed venous ulcers five years or more after the hip replacement.

DVT has been reported to be more common in the ipsilateral than the contralateral leg.[16] A recent meta-analysis suggested that DVT is twice as common in the operated leg,[17] and one would expect a similar pattern of distribution for ulceration. The distribution of the venous ulcers was found to parallel the figures for the laterality of DVT after THR as reported in the literature (Table IV). Although the numbers are small and do not demonstrate a statistical significance, the trend appears to favour the involvement of the operated leg.

All our patients wore TED stockings while in hospital, and were advised to continue to wear them until their outpatient appointment six weeks after the operation. Most patients also had foot pumps and only high-risk patients received either subcutaneous heparin or low molecular weight heparin. Our finding of no increased risk of venous ulceration after THR does not support the use of routine chemical prophylaxis in patients who are not at risk for the development of thromboembolism.

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