

Site of fracture and associated functional scores before and after fracture

Site of fracture	No of patients	Mean (SD) functional score	
		Before fracture	After fracture
<b>Arm:</b>			
Hand	8	88.12 (5.30)	71.88 (8.43)
Wrist	37	88.78 (6.60)	63.05 (9.58)
Elbow	4	90.00 (0.00)	67.50 (2.89)
Humerus	30	86.50 (6.97)	58.13 (10.24)
<b>Leg:</b>			
Foot	6	90.00 (0.00)	72.50 (4.18)
Ankle	10	88.50 (4.74)	65.20 (12.58)
Shin bone	5	90.00 (0.00)	55.40 (12.18)
Knee	5	86.86 (3.21)	42.00 (13.04)

Mean functional score before fracture (88.2 (5.87)) v mean functional score after fracture (62.87 (11.61)),  $p < 0.001$  (Wilcoxon matched pairs test).

were visited by a district nurse, and three received meals on wheels. Forty four patients required new help from relatives and neighbours, and six of these temporarily left their homes. Nine paid for private cleaners and one employed a cook. Sixty five stated that they required home help especially during the first two to four weeks after sustaining the fracture. Fifteen were severely disabled, and 59 had moderate functional disability on the modified Barthel activities of daily living index.

### Comment

The targeted group had been discharged home from an accident and emergency department immediately after sustaining minor fractures. Most of the patients lived alone or with an elderly carer. The contribution of statutory services was disappointing.

Roberts noted that patients with fractures of the arm faced particular difficulties despite being fully mobile.<sup>3</sup> Our study does not support this, but patients with fractures of the knee, humerus, or shin bone had significantly lower activities of daily living scores after

fracture (analysis of variance,  $F=6.27$ ,  $p < 0.001$ ). This is partly because management of these fractures entails near total immobilisation and non-weight bearing of the affected limb, which directly influences the Barthel index. The effects of splinting are amplified in patients with contralateral hemiplegia or severe arthropathy.

This study proves that minor fractures adversely affect the functional independence of elderly people. It also highlights the fact that statutory services fail to meet the minimum requirements of care. Few elderly people welcome a change of residence if they can help it, and we contend that the six patients who temporarily had to abandon their homes experienced a severe and avoidable form of social disruption.

Emergency management of elderly people should include a prompt and comprehensive appraisal of their functional ability and social support. Some guidelines have been given by Rowland *et al.*,<sup>4</sup> and aftercare officers have been advocated.<sup>5</sup> There is an urgent need to improve statutory services and develop a more structured and efficient system of communication between accident and emergency staff and community workers.

We thank Mr A J M Simison and Mr N P Geary, orthopaedic consultants, and the nurses in their clinics for their cooperation and help, and Professor R Tallis and Dr J Barrett for critical comments.

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(Accepted 16 August 1991)

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BMJ 1991;303:1515-6

## Transmission of *Plasmodium falciparum* by heart transplant

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Post-transfusion malaria, a well known iatrogenic infection, is preventable by systematically screening exposed blood donors. Possible organ donors are not, however, routinely screened. We report here the first case of transmission of *Plasmodium falciparum* malaria by a heart transplant.

### Case report

A 53 year old Portuguese woman was admitted on 23 April 1990 for heart transplantation for left ventricular insufficiency. Postoperatively her condition was stable until a high grade fever of 40°C appeared on the 12th day after transplantation. *P falciparum* malaria was diagnosed on day 18, when trophozoites were found in a Giemsa stained thin smear taken for a complete blood count (10.3% parasitaemia). Despite treatment with intravenous quinine 20 mg/kg/day she died of complicated malaria on day 22.

As the patient had no history of travel to any malarious area, an investigation was conducted at our blood transfusion centre. Even before the results of serological tests on the blood transfused during and

after the operation were confirmed negative, we suspected the transplanted heart as the source of contamination. We discovered that the heart, procured from another hospital, came from a 51 year old Cameroonian woman. This donor, who suffered an intracerebral haemorrhage, had been in good health since arriving in France 15 months earlier with no history of fever or illness. Therefore malaria testing had not been included in the serological screening, and the African origin of the donor was overlooked. The heart donor's serum indeed proved positive: antibody titres 1/600, one positive arc on counter-current immunoelectrophoresis to *P falciparum*, and strongly positive for *P falciparum* antigen on enzyme linked immunosorbent assay (ELISA; sensitivity 94% and specificity 99%).

Both kidneys had also been grafted. The first recipient was a 45 year old man, who died of overwhelming cytomegalovirus infection 45 days after transplantation. Serological tests for malaria antibody were negative on days 0, 30, and 45 but were weakly positive for antigen on day 30. The second recipient was a 4 year old boy, whose condition was stable and remarkably good. Serological tests were still giving negative results 105 days after transplantation.

### Comment

To our knowledge there has been only one report of transmission of malaria by an organ transplant (kidneys).<sup>1</sup> In other reports of possible transmission from a transplanted organ recrudescence of malaria in the recipient remained a possibility.<sup>2,5</sup>

In our case, although the donor had lived in France for 15 months and had a relatively low antibody titre, she may have had a subclinical parasitaemia with a chloroquine resistant strain (IC50 223 nmol/l). Although the organs were flushed out before transplantation, schizonts may have adhered to the vascular endothelium and multiplied when flushed with the recipient's blood.

The lack of knowledge about the donor's origin combined with the many other possible causes of fever in the organ recipient led to a late diagnosis. A blood film is simple and cheap to perform and may be life saving. We therefore re-emphasise the need to screen all febrile patients who have recently had a transplant operation (or transfusion) for malaria.

Pretransplantation evaluation of donors, especially a detailed travel history, is important but often difficult. An asymptomatic carrier from an area endemic for malaria may, however, be a high risk donor. We

recommend systematic screening of donors, even after transplantation. A positive finding on malaria testing before transplantation need not prevent the transplantation but should protect both patients and clinicians against the hazards of diagnostic delay.

We thank Pr Grandjakhch, department of heart transplantation, Pitié-Salpêtrière Hospital, and S Dussolier, T Seror, M Sibony, N Uwechue, and J Zanoni.

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(Accepted 20 July 1991)

## What happens to patients with non-vascular leg pain?

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BMJ 1991;303:1516

Non-vascular leg pain is a term used to describe pains in the leg or foot that suggest arterial occlusive disease but where specialist assessment shows that this is not the cause. Spinal claudication that mimics intermittent claudication is well recognised,<sup>1</sup> but other conditions such as arthritis, neuropathy, and lymphoedema can also present as "atypical claudication."<sup>2</sup> The diagnosis may be complicated by evidence of arterial disease that is not severe enough to account for the symptoms. Little is known about what happens to patients with non-vascular leg pain. We present a prospective study of such patients, assessed at least one year after they had initially been referred.

### Patients, methods, and results

During the three years 1986-9, 525 patients with pain in the leg or foot were referred to the vascular surgical clinic. Among these, 55 had non-vascular pain (40 in the leg and 15 in the foot). We excluded diabetic foot problems. Arterial disease was excluded clinically and by measuring the systolic pressure at the ankle with Doppler ultrasonography and by performing selective stress testing with a simple heel raising exercise.

Patients were invited for review 12-48 (median 27) months later, and 49 attended. Their pain was assessed with a five point score (from "much better" to "much worse") and by linear analogue. The details of referrals to other specialists, the diagnoses that they had made, and the treatments that they had given were recorded. Quality of life was assessed by measuring on linear analogue scales the degree to which pain had interfered with sleep, activities in the home, work, and recreation. Ankle pressures were measured with Doppler ultrasonography before and after exercise testing.<sup>3</sup>

Fifteen patients had been referred to other specialists, who had made diagnoses in 13 (table). The eight patients with lumbar spine conditions were all treated conservatively. The two patients with multiple sclerosis had received injections of adrenocorticotrophic hormone. The patient with osteoarthritis of the hip had a hip replacement operation. The symptoms of 11 of these patients were stable or improved.

The condition remained undiagnosed in 36 patients.

Symptoms were improved in 11, unchanged in 17, and worse in eight. Pain scores were significantly lower and quality of life scores significantly higher in these 36 patients than in the 13 patients who had been investigated and in whom a diagnosis had been made (mean pain score 3.60 v 5.27 (95% confidence interval 0.08 to 3.3); mean quality of life score 77.7 v 59.0 (2.5 to 35.0)).

Six patients had evidence of mild arterial disease at follow up (a new finding in two), but none of these patients had symptoms that were compatible with arterial insufficiency.

### Comment

Our finding that one in 10 patients referred with suspected arterial disease had non-vascular leg pain is similar to the experience of Tait *et al.*<sup>2</sup> The follow up assessment one to four years after referral showed that Doppler measurements of pressure combined with selective exercise testing was effective in excluding arterial disease.

Problems of the lumbar spine are commonly confused with intermittent claudication, and symptoms need to be carefully evaluated to distinguish between these two conditions.<sup>1,4</sup> It is rare for multiple sclerosis to present with symptoms mimicking vascular disease, but this happened in two of our patients.

This study identified two groups of patients, and the symptomatic outcome in each was generally good. The smaller group of patients with more troublesome symptoms were referred to other specialists. After treatment, which was largely non-surgical, only four patients were worse than before. The remaining patients had no further investigations, and at follow up less than a quarter said that their symptoms had deteriorated. No patient was severely disabled by pain.

After important arterial disease has been excluded by Doppler studies most patients with non-vascular leg pain can simply be reassured. Only patients whose symptoms are troublesome or worsen are likely to benefit from further investigation.

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(Accepted 4 July 1991)

Conditions causing non-vascular  
leg pain in 13 patients, diagnosed  
after referral to other specialists

Diagnosis	No*
Spinal stenosis	3
Sciatica	3
Lumbar spondylosis	2
Peripheral neuropathy	2
Multiple sclerosis	2
Osteoarthritis of hip	1
Morton's neuroma	1

\*One patient had both spinal stenosis and peripheral neuropathy.