

# Lower-extremity amputation: A 6-year follow-up study in Brazil

JMP de Godoy, MF de Godoy, F Batigalia, ARF Trávolo, EHF Monteiro

Department of Cardiology and Vascular Surgery, São José do Rio Preto University School of Medicine, São Paulo, Brasil

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## ABSTRACT

**Purpose.** To evaluate the 6-year mortality in 50 patients following lower-limb amputation.

**Methods.** The cumulative survival rate of 50 (28 men, 22 women) amputees aged 54 to 94 years (mean, 67.3; median, 73.5) was retrospectively studied from 1993 to 1998. Indications for above- or below-knee amputation were trauma (n=2), vasculitis (n=2), and critical ischaemia of the lower limbs (n=46). Leg amputation was performed after anamnesis, physical examination, and angiography. All patients were followed up for 6 years by phone or domiciliary visit. A death certificate was verified when a patient was lost to follow-up. Statistical analysis was expressed by the actuarial survival curve.

**Results.** Of 50 amputees, 36 died in the 6 years following leg amputation: 22 in the first year, 3 in the second year, 5 in the third year, 2 in the fourth year, 2 in the fifth year, 2 in the sixth year; 14 remained alive after 6 years.

**Conclusion.** Patients who underwent lower-limb amputation had a high 6-year mortality. Most deaths occurred in the first year.

**Key words:** amputation; follow-up studies; leg; mortality

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## INTRODUCTION

Lower-limb amputation was first performed as a form of punishment during the Hammurabi era in Babylon. It was subsequently recommended by Hippocrates in Greece as treatment for vascular gangrene.<sup>1</sup> Critical limb ischaemia is a serious clinical condition that often immediately precedes limb loss. The incidence of limb-threatening ischaemia has increased recently with a consequent rise in need for amputation.<sup>2</sup> The Second European Consensus Document on chronic critical leg ischaemia attempted to define this disease and give direction to its investigation and management. It has been estimated that 50 to 100 amputation procedures per 1 000 000 population are performed each year,<sup>3</sup> a

continued high rate of primary amputation. In a United Kingdom study of patients with chronic critical limb ischaemia, 66% underwent revascularisation procedures, 16% underwent primary amputation, 10% received minor amputation plus medication, and 8% were prescribed symptomatic treatment only.<sup>4</sup>

The severity of ischaemia is an important predictive factor for amputation.<sup>5</sup> Coronary artery disease, nephropathy, and type of vascular reconstruction surgery are the most important criteria that determine the 30-day postoperative mortality rate.<sup>2</sup>

The aim of the present study was to retrospectively analyse the 6-year mortality of 50 amputees.

## METHODS

The cumulative survival rate of 50 (28 men, 22 women) patients aged 54 to 94 years (mean, 67.3; median, 73.5) who underwent above- or below-knee amputation was retrospectively studied from 1993 to 1998 in the São José do Rio Preto University School of Medicine. Indications for amputation were trauma (n=2), vasculitis (n=2), and critical ischaemia of the lower limb (n=46). All patients had chronic arterial

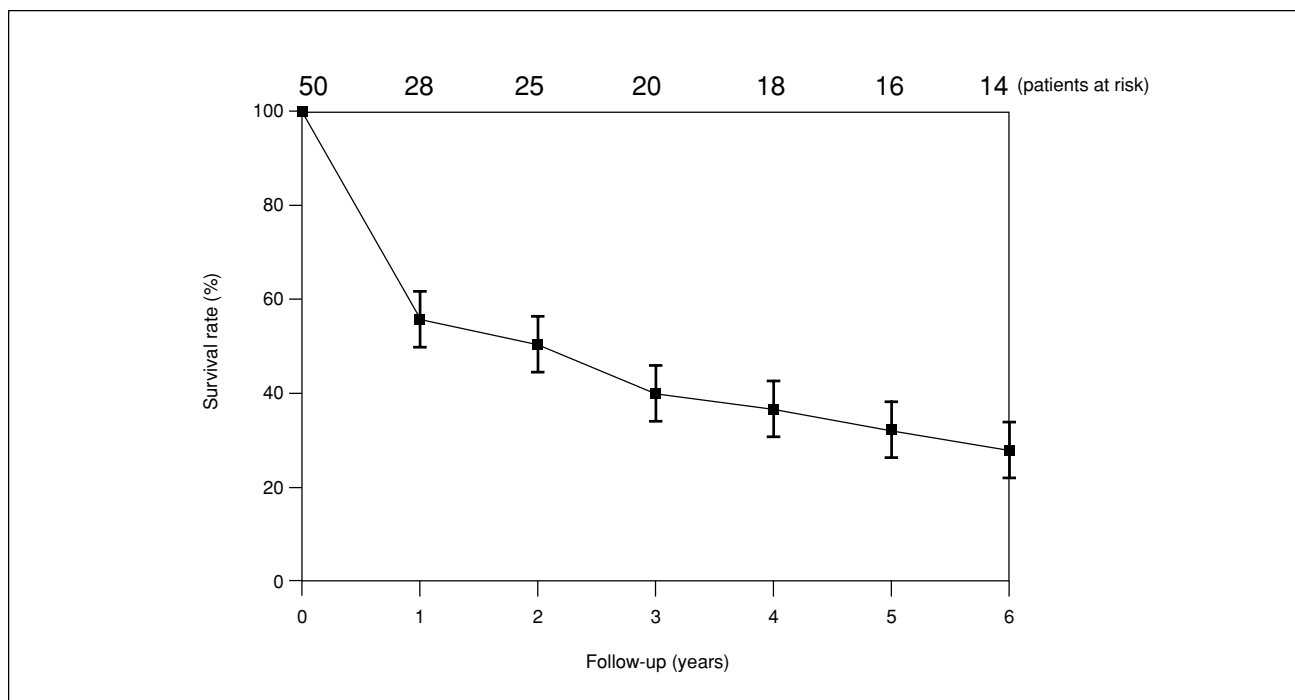
insufficiency confirmed by anamnesis, propaedeutics, and angiography and all were followed up for 6 years by phone or domiciliary visit. A death certificate was verified when contact with a patient was lost. Statistical analysis was expressed by the actuarial survival curve.

## RESULTS

At 6-year follow-up, 14 patients were still living and 36 had died: 22 in the first year, 3 in the second year, 5 in the third year, 2 in the fourth year, 2 in the fifth year, and 2 in the sixth year. The survival rate for each year following amputation up to 6 years was 56% (standard deviation [SD] 7%), 50% (SD, 7%), 40% (SD, 7%), 36% (SD, 7%), 32% (SD, 6%), and 28% (SD, 6%), respectively (Fig). Over the whole 6-year period, 72% of patients died, 44% of them died during the first year.

## DISCUSSION

Trans-tibial amputation for vascular disease has a reported mortality rate of 33% at 6 months, 47% at 2



**Figure** Cumulative survival rate of 50 patients who underwent lower-limb amputation during a 6-year follow-up

years, and 92% at 8 years.<sup>6</sup> Even when patient age, individual risk factors, severity of vascular disease, and life expectancy are taken into account, these data show a high mortality among patients undergoing lower-limb amputation.

The current mean life expectancy in Brazil is 67 years, although this varies from state to state. The median age of the 50 patients in this study was 73.5 years. This suggests that critical limb ischaemia culminating in amputation usually occurs at an advanced age, and thus increases the inherent physical limitations of age. The cause of death was difficult to identify for each patient but was generally cardiovascular in origin.

Critical limb ischaemia is a severe clinical condition associated with a high morbidity and

mortality. It is the most frequent indication for amputation. Patients with critical limb ischaemia who undergo revascularisation procedures have a 5-year mortality of up to 51%.<sup>7</sup> Predictive factors of such a high mortality include a history of coronary artery disease, renal dysfunction, and, in particular, the type of vascular reconstruction surgery performed.<sup>3</sup>

The results of this study confirm this: chronic critical limb ischaemia was associated with a high mortality rate in elderly patients who underwent revascularisation procedures or major amputations. Patients who undergo lower-limb amputation have a high 6-year mortality although most mortality occurs in the first year following amputation.

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