ABSTRACT

Multiple frequency bioelectrical impedance analysis (MFBIA) has previously been shown to provide accurate relative measures of lymphedema in the upper limb of patients (1). This paper reports the results of a three year prospective study to evaluate the efficacy of MFBIA to predict the early onset of lymphedema in patients following treatment for breast cancer.

Bioelectrical impedance measurements and circumferential measurements of each upper limb were recorded in healthy control subjects (n=60) to determine the normal range of the ratio (dominant/non-dominant) of extracellular and total limb volumes respectively. Patients undergoing surgery for the treatment of breast cancer were recruited as the study group; MFBIA and circumferential measurements were recorded pre-surgery, one month post-surgery and then at two month intervals for 24 months.

One hundred and two patients were recruited into the study. Twenty patients developed lymphedema in the 24 months follow up period of this study. In each of these 20 cases MFBIA predicted the onset of the condition up to 10 months before the condition could be clinically diagnosed. Estimates of the sensitivity and specificity were both approximately 100%. At the time of detection by MFBIA, only one of the patients returned a positive test result from the total limb volumes determined from the circumferential measures. These results confirmed the suitability of the MFBIA technique as a reliable diagnostic procedure for the early detection of lymphedema.