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Body surface mapping of late potentials

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INTRODUCTION

Signal averaged electrocardiography is a good non-invasive method with which the existence of the substrate of sustained monomorphic ventricular tachycardia (s-VT) can be assessed by detecting ventricular late potentials from the body surface\textsuperscript{1-6}. The method most widely used for detecting late potentials at present is the time domain method. However, there are some problems and limitations of the time domain method for the evaluation of late potentials. To overcome these limitations, the frequency domain method\textsuperscript{7,8} and spectro-temporal mapping\textsuperscript{9} have been recently introduced. These methods analyze late potentials based on XYZ orthogonal leads and Frank leads. However there is the possibility that the vector magnitude is not always most adequate since the distribution of the late potentials on the body surface may not be uniform. Therefore, we assessed the body surface distribution of late potential by the use of unipolar leads on the chest wall adjacent to the heart. Various reports have used from 9 to 87 leads for body surface mapping\textsuperscript{10-18}. In this chapter we will describe the methods and findings on body surface mapping of late potentials.

METHODOLOGY FOR BODY SURFACE MAPPING OF LATE POTENTIAL

Equipment and lead system

Body surface mapping of late potentials was performed in patients with late potentials assessed by using standard signal averaging equipment and techniques. Body surface mapping of the signal averaged ECG in our laboratory was initially made at 16 points on the front chest and 16 points on the back, totaling 32. Subsequently we assessed monopolar leads at 32 points on the anterior chest and 16 points on the back, totaling 48 points, as shown in Figure 1 (upper panel). More precisely, for signal averaged ECG
Figure 1. Leads positions for signal averaged ECG map (upper panel) and body surface ECG map (under panel) Signal averaged ECG map has 48 leads. The area covered is a little lower than the area of body surface ECG map (87 leads). These areas of signal averaged ECG map leads are chosen because there are many cases in which the maxima of late potential map in inferior wall infarction is considerably lowered. Arrow mark shows the level of Vth intercostal space.