(VT), regularity and frequency of CMG did not change, but amplitude of CMG decreased. The amplitude of CMG was parallel to the systric blood pressure. We could detect VT by frequency and amplitude of CMG. iii) Coronary artery occlusion and β-blocking agent changed the contour of CMG, but did not affect amplitude of CMG. We could also record intracardiac CMG through floating electrode catheter. In conclusion, intracardiac CMG was very effective to detect the ventricular tachyarrhythmia.

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SURGICAL THERAPY FOR VENTRICULAR TACHYCARDIA/FIBRILLATION ASSOCIATED WITH VENTRICULAR ANEURYSM

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From 1968 to 1985 we oeprated on 13 patients with chronic sustained or recurrent VT/Vf associated with ventricular aneurysm. All cases were non-responsive to various medical therapy and they could not but be controlled with frequent DC countershock.
Until 1983 simple aneurysmectomy (or aneurysmectomy with CABG) was the method we took. From 1984 our strategy was modified to aneurysmectomy with isolation (encircling myotomy) or ablation (endocardial excision or cryoablation) of the VT focus which was determined by the pre- and intra-operative electrophysiological study.
In ten patients VT/Vf attacks were completly disappeared after operation and they have been followed-up without medication for arrhythmias.
In remaining 3 patients (for whom simple aneurymectomy was indicated) 9 cases experienced recurrence of VT but was easily controlled with anti-arrhythmic drugs which were ineffective preoperatively.
One patient died on table because of irreversible Vf. It is remarkable that even with simple aneurysmectomy, satisfactory results have been obtained in 8 out of 9 patients (89%).
Removal of stretch of the boundary myocardium by aneurysm and/or hemodynamic deterioration with simple aneurysmectomy might be sufficient for termination of VT/Vf attack in many patients, although it is our current strategy to perform direct focus ablation or isolation for more complete and satisfactory results.

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280–291 K. Ishikawa, *Tokyo*
S. Mashima, *Tokyo*

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EVOLUTION OF BODY SURFACE ISOPOTENTIAL MAPS DURING VENTRICULAR REPOLARIZATION IN NORMAL CHILDREN

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It is well known that the T wave changes with age in normal children. However, there has been no report dealing with the body surface isopotential maps of the T wave in children of different age groups. We studied the T maps in normal children excepting the newborn infant. Thirty healthy children were divided into 3 age groups; 10 subjects aged from 5 months to 3 years (Group A), 10 subjects from 4 to 9 years (Group B) and 10 subjects from 10 to 15 years (Group C). A single maximum initially appeared on the left anterior chest and stayed there during the T wave in all groups. In all subjects of Group A and one subject aging 4 years in Group B, a single minimum initially appeared nearby the right shoulder and then shifted to the anterior central chest. In other subjects a single minimum stayed nearby the right shoulder during the T wave. The negative area on the right anterior chest became reduced with age and limited around the right shoulder. By QRST area maps, the integral maximum was shown on the left anterior chest in all age groups, and its value increased with age. The integral minimum was shown on the anterior central chest in 4 subjects of Group A and on the right shoulder in the others. The distributions of the positive and the negative area were almost same among each group, but the negative area on the anterior chest decreased with age. These results may indicate that the evolution of the T wave in normal children is brought about by the difference in the ventricular gradient.

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HEART-MODEL USING FINITE ELEMENT METHOD INTENDED TO FIT TO EACH INDIVIDUAL SUBJECT BY ANALYTICAL GEOMETRY –THE EFFECT OF BODY FORM ON FORWARD CALCULATION OF ELECTROCARDIOGRAM–

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Body surface potentials were calculated using finite element method in heart-torso model intended to fit to each individual subject which can be modifid easily by analytical definition.
The dipole source in the heart and its surrounding field up to the body surface were represented by a model with one innermost sphere and ten outlying ellipsoids encircling in succession like an onion.
On the innermost sphere's surface,98 points were designated and 98 radiating lines were drawn starting at the sphere's center.
These lines also penetrated the ten outer ellipsoids' surfaces and 98 penetration points were given for each ellipsoidal surface.
So the model comprised 4992 tetraheadrons elements defined by 1079 nodes.
The basic structure of the model, whose diameters of right-to-left, down-to-up, and front-to-back were 34cm, 68cm, and 20cm respectively, was modified to seven models.
Only one dipole was placed samely in these heart-torso models and then each body surface potentials was calculated.
The closer the cardiac dipole was at body surface, the bigger and closer the potentials of maxima and minima were.
As a result, it was suggeested that body form was influenced greatly to body surface potential and this model was useful fitting as much as possible to real human torso shape in its three radii.