Standard surface electrocardiogram (EKG) reconstruction from implanted device electrograms (EGM)

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Technology description

This invention is a method of reconstruction of the standard 12-lead surface EKG given values of the electrical potential from an implanted medical device. This implanted device can be oriented in an arbitrary fashion and reconstruction technique is obtained through physical measurement of the orientation of the implanted device or correlation with a standard 12-lead EKG obtained from the patient. The transformation of the EGM to the EKG will then be determined for the individual patient. This transformation will encompass the information about lead electrodes and can positions as well as about the geometry of the chest for that individual patient and the way the heart is sitting in the chest. Given the changes in the way the heart sits in the chest with different positions, a different transformation can be obtained for the multiple positions including but not limited to the supine, prone, standing, sitting and decubitus positions.

Application area

1) Ischemia detection
2) Myocardial Infarction detection
3) Electrolyte abnormalities detection
4) Assessment of effect of medications
5) Improved rhythm discrimination

Advantages

1) Currently there is no implantable device that is being used to detect ischemia, myocardial infarction, electrolyte imbalances, or drug effects on the heart such as QT prolongation.

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