Proposal of thrombus detection method in extracorporeal circulation using a Cole-Cole analysis

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The thrombus existence is an important criterion in the Judgment of circulatory system diseases and the development of circulator organ device. In this study, the possibility of thrombus detection using electrical measurements was explore. Electrical measurement of thrombus formation process was carried out in a circulation. Swine blood was coagulated by the addition of 0.02M calcium chloride solution. Impedance between two stainless rings attached to the circulation was measured 120 minutes to determine the relaxation frequency by Cole-Cole analysis. The ACT was measured every 20 minutes. Relaxation frequency increases initially and reaches a peak at 85 minutes. The ACT were less than 100 near 85 minutes. It is presumed that influence of the thrombus formation is strong after the peak. Since the peak of the relaxation frequency appeared in thrombus formation process, the possibility of thrombus detection using the peak of the relaxation frequency is shown.