Temperature monitoring in radiofrequency catheter ablation of atrial flutter using the linear ablation technique.

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摘要

Abstract

INTRODUCTION: Information about temperature and impedance monitoring during radiofrequency catheter linear ablation of atrial flutter has not been reported. We proposed that a radiofrequency catheter ablation system using a closedloop temperature control model could decrease the incidence of coagulum formation and shorten the radiation exposure and procedure times compared with those found in a power control model. METHODS AND RESULTS: Forty patients (8 women and 32 men; mean age 64 +/- 7 years) with atrial flutter were referred for radiofrequency ablation. The patients were randomized into two groups: group I patients underwent radiofrequency catheter linear ablation of atrial flutter using a power control of energy output model; and group II patients underwent the closedloop temperature control model with a target electrode temperature of 70 degrees C. As compared with group II, group I patients had a higher incidence of coagulum formation (12% vs 2%, $P < 0.05$), temperature shutdown (11% vs 0%, $P < 0.01$), and impedance shutdown (16% vs 3%, $P < 0.01$), more radiofrequency applications (7 +/- 3 vs 4 +/- 2, $P < 0.01$), and longer procedure time (100 +/- 25 vs 75 +/- 23 minutes, $P < 0.05$) and radiation exposure time (31 +/- 10 vs 20 +/- 7 minutes, $P < 0.05$) required for successful ablation. Larger deviations of temperature (9.0 degrees +/- 2.4 degrees C vs 5.0 degrees +/- 1.2 degrees C, $P < 0.0001$) and impedance (9.2 +/- 2.6 omega vs 5.3 +/- 1.6 omega, $P < 0.0001$) were also found in group I patients compared with those in group II. CONCLUSIONS: This study demonstrated that a closed-loop temperature control model could facilitate the effects of radiofrequency catheter ablation of the atrial flutter circuit by decreasing coagulum formation, temperature and impedance shutdown, and procedure and radiation exposure times.