

IMAGES IN ELECTROPHYSIOLOGY

Electrical cardioversion of atrial fibrillation using four defibrillation patches

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A 73-year-old female patient with hypertrophic cardiomyopathy presented with angina. During catheterization, she developed atrial fibrillation with a rapid ventricular response, associated with severe haemodynamic compromise. Two transthoracic patches (pro-padz, Zoll Medical Corporation, USA) were positioned in the anterior–posterior position, but a rectilinear biphasic 200-J shock (M-series defibrillator, Zoll Medical Corporation, USA) was unsuccessful. Four further shocks using hand-held paddles were also unsuccessful, despite manual pressure applied to improve

contact, as were six shocks at various patch positions. Amiodarone (450 mg) was administered, but five additional 200-J biphasic shocks were ineffective.

An increased thoracic electrical impedance was implicated as the cause of failure, because of the patient's body habitus (height, 160 cm; weight, 75 kg; body surface area, 1.75 m²). Prior to contemplating internal defibrillation, the impedance was decreased by increasing the defibrillation area with the use of four patches. Two patches were placed on the precordium; the insulation



Figure 1 (A) Custom four-patch configuration that successfully cardioverted atrial fibrillation after 15 failed attempts. (B) The two frontal (white arrow) and two back patches (dark arrow); each pair of patches has been connected together and then to the external defibrillator.

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was stripped, and the two wires were connected together and then to the defibrillator output. A similar connection was made for the patches placed on the midscapular and the left subscapular position. Using this configuration, a 200-J biphasic shock restored sinus rhythm, with immediate haemodynamic improvement.

A number of techniques have been reported to increase cardioversion success rates using monophasic shocks, such

as the sequential double shock configuration. The use of biphasic shocks increases cardioversion rates, minimizing the importance of thoracic electrical impedance. Our experience indicates that this factor should be accounted for in unsuccessful cases; a custom four-patch configuration can be easily applied and may prove useful (*Figure 1A and B*).

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