PREHOSPITAL CARE

A case of dextrocardiac ventricular fibrillation arrest

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Successful defibrillation of a patient with dextrocardia using conventional anterolateral paddle positions raises doubts about the necessity to place paddles in the exact recommended positions.

Evidence found relates either to volunteers in a laboratory setting or to defibrillation of atrial arrhythmias. The conclusion is that there is no published difference either in transthoracic impedance or in success of defibrillation between anteroposterior and anterolateral paddle positions. In the absence of any evidence for an ideal apical paddle position in the standard anterolateral defibrillation of ventricular arrhythmias, the emphasis in ALS and resuscitation guidelines on “correct” positioning seems misplaced, and, by adding unnecessary information, may hinder learning the skill of defibrillation. Early defibrillation is crucial to successful recovery from cardiac arrest and anything that delays cardioversion should be avoided. The limited evidence suggests that the exact position of the paddles does not matter. The time taken to find the “correct” position is time wasted and it may instead be preferable to teach people merely to place the apical paddle to the left of the nipple in the midaxillary line.

A 52 year old woman with Kartagener’s Syndrome (situs inversus, bronchiectasis, and paranasal sinusitis) collapsed suddenly at home. The paramedics arrived after approximately 10 minutes without basic life support and applied defibrillator paddles in the conventional right sternal and left apical positions. Ventricular fibrillation was diagnosed and two shocks of 200J were delivered. She returned to spontaneous circulation with sinus tachycardia after a brief period of electrical stunning. On arrival in the emergency unit she maintained her cardiac output and spontaneous respiration, although she remained unconscious. She was transferred to the intensive care unit and died two days later.

DISCUSSION

Throughout resuscitation training, great emphasis is put on to correct defibrillator paddle placement. Although necessary, we feel this case illustrates that exact position of the paddles may not actually be as important as delivering the shocks themselves. We have attempted to look at the evidence for current paddle placement in resuscitation.

The Advanced Life Support (ALS) manual of 2000 describes the standard paddle positions for defibrillation in cardiac arrest.¹ One paddle is placed “to the right of the upper sternum below the clavicle” and the other is placed “level with the 5th left intercostal space in the anterior axillary line” in the region of electrocardiogram leads V5 and V6. The International Liaison Committee on Resuscitation (ILCOR) published similar guidelines in 2000.² The apical paddle is positioned more laterally “to the left of the nipple with

the centre of the electrode in the midaxillary line”. These positions are intended to maximise current flow through the myocardium.

Heames *et al* undertook an observational study of doctors’ positioning of paddles on a resuscitation manikin.³ Most apical paddles were applied too medially and cranially, with only 22% within 5 cm of the recommended position. They suggested that the reduced separation of the paddles might result in more current passing through non-cardiac tissue, reducing the chance of successful defibrillation. They concluded that ALS teaching “must place greater emphasis on paddle position if success of defibrillation is to be optimised”. Lakhota *et al* performed a similar study in India, with identical conclusions.⁴

However, there is little evidence that paddle position makes much difference to successful defibrillation.

Garcia and Kerber studied transthoracic impedance in 20 volunteers using the three paddle positions then recommended by the American Heart Association (anterior–apex, apex–posterior, anterior–posterior).⁵ They concluded that the three positions were equivalent, and furthermore that a posterior paddle could be placed in either the right or left infrascapular region without affecting impedance.

Both the ALS manual and the ILCOR guidelines referred to Kerber *et al*’s prospective study of 173 patients electively cardioverted from atrial fibrillation (AF) or flutter.⁶ This found no difference between standard anterolateral and anteroposterior paddle positions. Ideal positioning of the apical or sternal paddles in standard defibrillation was not studied. As they did not include any patients in ventricular tachycardia or fibrillation, they also stated that their conclusions did not necessarily apply to those arrhythmias.

Potier de la Morandiere and Morris reviewed five studies looking at anteroposterior versus anterolateral paddle positions in emergency cardioversion of AF and found “no evidence to suggest that paddle position significantly influences the success of cardioversion”.⁷

Gorenok *et al* recently published a case report of emergency cardioversion of a patient in AF with dextrocardia. A 66 year old woman was successfully cardioverted with altered paddle positions. One paddle was placed to the right of the sternum (usual position) but the apex paddle was placed on the right side of the chest.⁸

We performed a search of Medline 1966 to May 2005, using the OVID interface: [(exp ventricular fibrillation OR VF.mp) AND (exp electric countershock OR electrode position.mp OR electrical cardioversion.mp OR DC cardioversion.mp)] LIMIT to human, English language, adults and clinical trial. No papers relevant to ventricular arrhythmias were found.

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Abbreviations: AF, atrial fibrillation; ALS, Advanced Life Support; ILCOR, International Liaison Committee on Resuscitation

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