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IMAGE IN CARDIOLOGY

Arterial waveform during extracorporeal cardiopulmonary resuscitation

Curva de linha arterial durante ressuscitação cardiopulmonar

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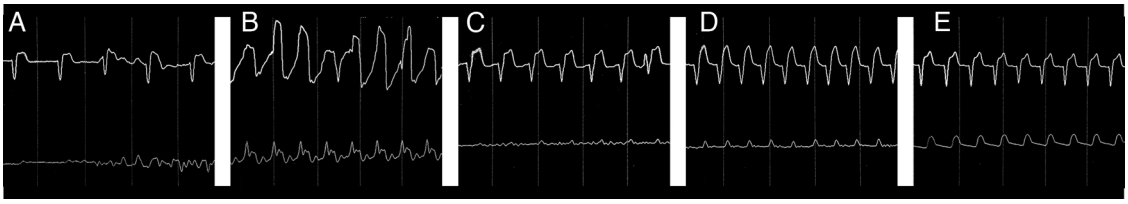

Figure 1 Electrocardiographic and arterial line waveforms during resuscitation. (a) Pulseless electrical activity cardiac arrest with an almost flat arterial waveform at 0-5 mmHg and start of manual compression generating a pulsatile blood flow with a low mean arterial pressure; (b) compressions using a chest compression system generating a pulsatile blood flow with a mean arterial pressure of 50 mmHg; (c) arterial line waveform showing an almost flat arterial wave form with a mean arterial pressure of 60 mmHg during initial venoarterial extracorporeal membrane oxygenation; (d) arterial line waveform showing recovery of pulsatile blood pressure with a pulse pressure of 10 mmHg after 5 min of venoarterial extracorporeal membrane oxygenation; (e) arterial line waveform showing full recovery of pulsatile blood pressure after percutaneous coronary intervention.

Extracorporeal cardiopulmonary resuscitation (ECPR) is the implantation of venoarterial extracorporeal membrane oxygenation (VA-ECMO) in a patient experiencing a sudden and unexpected pulseless condition attributable to cessation of cardiac mechanical activity.

A 57-year-old male presented to our hospital with an acute coronary syndrome. A diagnostic coronary angiography was performed showing a critical lesion of the left main coronary artery, with severely compromised left ventricular systolic function. The patient was transferred to the intensive care unit awaiting coronary artery bypass grafting, and a right radial arterial line was put in place.

The patient complained of recurrent chest pain and rapidly evolved to cardiac arrest in pulseless electrical activity. The advanced cardiac life support protocol was started promptly, initially with manual compressions and then using

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an automatic chest compression system. Expeditiously the ECMO team cannulated and connected the patient to the ECMO machine. An emergent percutaneous coronary intervention (angioplasty and stent placement) of the left main coronary artery was performed. Arterial line waveform recordings were obtained during all stages of resuscitation (Figure 1).

ECPR is on its way to transforming patient outcomes after cardiac arrest, and arterial waveform interpretation is essential in the technical management of VA-ECMO.

Conflicts of interest

The authors have no conflicts of interest to declare.